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Previous Years

CAT

Solved Papers

(Topic Wise)

Section - I: Verbal Ability

DIRECTION ***for questions 1 to 18:*** *The passage below is accompanied by a set of questions. Choose the best answer to each question.*

Passage - I

In the late 1960s, while studying the northern-elephant-seal population along the coasts of Mexico and California, Burney Le Boeuf and his colleagues couldn't help but notice that the threat calls of males at some sites sounded different from those of males at other sites. . . . That was the first time dialects were documented in a nonhuman mammal. . . .

All the northern elephant seals that exist today are descendants of the small herd that survived on Isla Guadalupe [after the near extinction of the species in the nineteenth century]. As that tiny population grew, northern elephant seals started to recolonize former breeding locations. It was precisely on the more recently colonized islands where Le Boeuf found that the tempos of the male vocal displays showed stronger differences to the ones from Isla Guadalupe, the founder colony.

In order to test the reliability of these dialects over time, Le Boeuf and other researchers visited Año Nuevo Island in California—the island where males showed the slowest pulse rates in their calls—every winter from 1968 to 1972. “What we found is that the pulse rate increased, but it still remained relatively slow compared to the other colonies we had measured in the past” Le Boeuf told me.

At the individual level, the pulse of the calls stayed the same: A male would maintain his vocal signature throughout his lifetime. But the average pulse rate was changing. Immigration could have been responsible for this increase, as in the early 1970s, 43 percent of the males on Año Nuevo had come from southern rookeries that had a faster pulse rate. This led Le Boeuf and his collaborator, Lewis Petrinovich, to deduce that the dialects were, perhaps, a result of isolation over time, after the breeding sites had been recolonized. For instance, the first settlers of Año Nuevo could have had, by chance, calls with low pulse rates. At other sites, where the scientists found faster pulse rates, the opposite would have happened—seals with faster rates would have happened to arrive first.

As the population continued to expand and the islands kept on receiving immigrants from the original


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population, the calls in all locations would have eventually regressed to the average pulse rate of the founder colony. In the decades that followed, scientists noticed that the geographical variations reported in 1969 were not obvious anymore. . . . In the early 2010s, while studying northern elephant seals on Año Nuevo Island, [researcher Caroline] Casey noticed, too, that what Le Boeuf had heard decades ago was not what she heard now. . . . By performing more sophisticated statistical analyses on both sets of data, [Casey and Le Boeuf] confirmed that dialects existed back then but had vanished. Yet there are other differences between the males from the late 1960s and their great-great-grandsons: Modern males exhibit more individual diversity, and their calls are more complex. While 50 years ago the drumming pattern was quite simple and the dialects denoted just a change in tempo, Casey explained, the calls recorded today have more complex structures, sometimes featuring doublets or triplets. . . .

1. EXCEPT that:

1. male northern elephant seals might not have exhibited dialects had they not become nearly extinct in the nineteenth century.

2. the average call pulse rate of male northern elephant seals at Año Nuevo Island increased from the early 1970s till the disappearance of dialects.

3. changes in population and migration had no effect on the call pulse rate of individual male northern elephant seals.

4. the influx of new northern elephant seals into Año Nuevo Island would have soon made the call pulse rate of its male seals exceed that of those at Isla Guadalupe..

2. Which one of the following conditions, if true, could have ensured that male northern elephant seal dialects did not disappear?

1. Besides Isla Guadalupe, there was one more surviving colony with the same average male call tempo from which no migration took place.

2. The call tempo of individual immigrant male seals changed to match the average tempo of resident male seals in the host colony.

3. Besides Isla Guadalupe, there was one more founder colony with the same average male call tempo from which male seals migrated to various other colonies.

4. The call tempo of individual male seals in host colonies changed to match the average call tempo of immigrant male seals.

3. Which one of the following best sums up the overall history of transformation of male northern elephant seal calls?

1. The calls have transformed from exhibiting simple composition, less individual variety, and great regional variety to complex composition, great individual variety, and less regional variety.

2. Owing to migrations in the aftermath of near species extinction, the calls have transformed from exhibiting complex composition, less individual variety, and great regional variety to simple composition, less individual variety, and great regional variety.

3. The calls have transformed from exhibiting simple composition, great individual variety, and less regional variety to complex composition, less individual variety, and great regional variety.

4. Owing to migrations in the aftermath of near species extinction, the average call pulse rates in the recolonised breeding locations exhibited a

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gradual increase until they matched the tempo at the founding colony.

4. From the passage it can be inferred that the call pulse rate of male northern elephant seals in the southern rookeries was faster because:

1. a large number of male northern elephant seals migrated from the southern rookeries to Año Nuevo Island in the early 1970s.

2. a large number of male northern elephant seals from Año Nuevo Island might have migrated to the southern rookeries to recolonise them.

3. the male northern elephant seals of Isla Guadalupe with faster call pulse rates might have been the original settlers of the southern rookeries.

4. the calls of male northern elephant seals in the southern rookeries have more sophisticated structures, containing doublets and triplets.

Passage - II

Vocabulary used in speech or writing organizes itself in seven parts of speech (eight, if you count interjections such as Oh! and Gosh! and Fuhgeddaboudit!). Communication composed of these parts of speech

must be organized by rules of grammar upon which we agree. When these rules break down, confusion and misunderstanding result. Bad grammar produces bad sentences. My favorite example from Strunk and White is this one: “As a mother of five, with another one on the way, my ironing board is always up.”

Nouns and verbs are the two indispensable parts of writing. Without one of each, no group of words can be a sentence, since a sentence is, by definition, a group of words containing a subject (noun) and a predicate (verb); these strings of words begin with a capital letter, end with a period, and combine to make a complete thought which starts in the writer’s head and then leaps to the reader’s.

Must you write complete sentences each time, every time? Perish the thought. If your work consists only of fragments and floating clauses, the Grammar Police aren’t going to come and take you away. Even William Strunk, that Mussolini of rhetoric, recognized the delicious pliability of language. “It is an old observation,” he writes, “that the best writers sometimes disregard the rules of rhetoric.” Yet he goes on to add this thought, which I urge you to consider: “Unless he is certain of

doing well, [the writer] will probably do best to follow the rules."

The telling clause here is Unless he is certain of doing well. If you don't have a rudimentary grasp of how the parts of speech translate into coherent sentences, how can you be certain that you are doing well? How will you know if you're doing ill, for that matter? The answer, of course, is that you can't, you won't. One who does grasp the rudiments of grammar finds a comforting simplicity at its heart, where there need be only nouns, the words that name, and verbs, the words that act.

Take any noun, put it with any verb, and you have a sentence. It never fails. Rocks explode. Jane transmits. Mountains float. These are all perfect sentences. Many such thoughts make little rational sense, but even the stranger ones (Plums deify!) have a kind of poetic weight that's nice. The simplicity of noun-verb construction is useful—at the very least it can provide a safety net for your writing. Strunk and White caution against too many simple sentences in a row, but simple sentences provide a path you can follow when you fear getting lost in the tangles of rhetoric—all those restrictive and nonrestrictive clauses, those modifying phrases, those appositives and compound-complex sentences. If you

start to freak out at the sight of such unmapped territory (unmapped by you, at least), just remind yourself that rocks explode, Jane transmits, mountains float, and plums deify. Grammar is . . . the pole you grab to get your thoughts up on their feet and walking.

5. Which one of the following statements, if false, could be seen as supporting the arguments in the passage?

1. An understanding of grammar helps a writer decide if she/he is writing well or not.

2. Regarding grammar, women writers tend to be more attentive to method and accuracy.

3. It has been observed that writers sometimes disregard the rules of rhetoric.

4. Perish the thought that complete sentences necessarily need nouns and verbs!

6. "Take any noun, put it with any verb, and you have a sentence. It never fails. Rocks explode. Jane transmits. Mountains float." None of the following statements can be seen as similar EXCEPT:

1. A collection of people with the same sports equipment is a sports team.

2. Take any vegetable, put some spices in it, and you have a dish.

3. A group of nouns arranged in a row becomes a sentence.

4. Take an apple tree, plant it in a field, and you have an orchard

7. Inferring from the passage, the author could be most supportive of which one of the following practices?

1. The availability of language software that will standardise the rules of grammar as an aid to writers.

2. A campaign demanding that a writer's creative license should allow the breaking of grammatical rules.

3. A Creative Writing course that focuses on how to avoid the use of rhetoric.

4. The critique of standardised rules of punctuation and capitalisation.

8. All of the following statements can be inferred from the passage EXCEPT that:

1. “Grammar Police” is a metaphor for critics who focus on linguistic rules.

2. sentences do not always have to be complete.

3. the subject–predicate relation is the same as the noun–verb relation.

4. the primary purpose of grammar is to ensure that sentences remain simple.

9. Which one of the following quotes best captures the main concern of the passage?

1. “Nouns and verbs are the two indispensable parts of writing. Without one of each, no group of words can be a sentence . . .”

2. “Strunk and White caution against too many simple sentences in a row, but simple sentences provide a path you can follow when you fear getting lost in the tangles of rhetoric . . .”

3. “Bad grammar produces bad sentences.”

4. “The telling clause here is Unless he is certain of doing well.”.

Passage - III

The word ‘anarchy’ comes from the Greek anarkhia, meaning contrary to authority or without a ruler, and was used in a derogatory sense until 1840, when it was adopted by Pierre-Joseph Proudhon to describe his political and social ideology. Proudhon argued that organization without government was both possible and desirable. In the evolution of political ideas, anarchism can be seen as an ultimate projection of both liberalism and socialism, and the differing strands of anarchist thought can be related to their emphasis on one or the other of these.

Historically, anarchism arose not only as an explanation of the gulf between the rich and the poor in any community, and of the reason why the poor have been obliged to fight for their share of a common inheritance, but as a radical answer to the question ‘What went wrong?’ that followed the ultimate outcome of the French Revolution. It had ended not only with a reign of terror and the emergence of a newly rich ruling caste, but with a new adored emperor, Napoleon Bonaparte, strutting through his conquered territories.

The anarchists and their precursors were unique on the political Left in affirming that workers and peasants,

grasping the chance that arose to bring an end to centuries of exploitation and tyranny, were inevitably betrayed by the new class of politicians, whose first priority was to reestablish a centralized state power. After every revolutionary uprising, usually won at a heavy cost for ordinary populations, the new rulers had no hesitation in applying violence and terror, a secret police, and a professional army to maintain their control.

For anarchists the state itself is the enemy, and they have applied the same interpretation to the outcome of every revolution of the 19th and 20th centuries. This is not merely because every state keeps a watchful and sometimes punitive eye on its dissidents, but because every state protects the privileges of the powerful.

The mainstream of anarchist propaganda for more than a century has been anarchistcommunism, which argues that property in land, natural resources, and the means of production should be held in mutual control by local communities, federating for innumerable joint purposes with other communes. It differs from state socialism in opposing the concept of any central authority. Some anarchists prefer to distinguish between anarchist-communism and collectivist anarchism in order to stress the obviously desirable freedom of an individual or family

to possess the resources needed for living, while not implying the right to own the resources needed by others. . . .

There are, unsurprisingly, several traditions of individualist anarchism, one of them deriving from the 'conscious egoism' of the German writer Max Stirner (1806–56), and another from a remarkable series of 19th-century American figures who argued that in protecting our own autonomy and associating with others for common advantages, we are promoting the good of all. These thinkers differed from free-market liberals in their absolute mistrust of American capitalism, and in their emphasis on mutualism.

10. According to the passage, what is the one idea that is common to all forms of anarchism?

1. They all focus on the primacy of the power of the individual.

2. They all derive from the work of Pierre-Joseph Proudhon.

3. There is no idea common to all forms of anarchism; that is why it is anarchic.

4. They are all opposed to the centralisation of power in the state.

11. Of the following sets of concepts, identify the set that is conceptually closest to the concerns of the passage.

1. Revolution, State, Protection, Liberals.

2. Anarchism, Betrayal, Power, State.

3. Revolution, State, Strike, Egoism.

4. Anarchism, State, Individual, Freedom.

12. Which one of the following best expresses the similarity between American individualist anarchists and free-market liberals as well as the difference between the former and the latter?

1. Both prioritise individual autonomy; but the former also emphasise mutual dependence, while the latter do not do so.

2. Both reject the regulatory power of the state; but the former favour a people's state, while the latter favour state intervention in markets.

3. Both are sophisticated arguments for capitalism; but the former argue for a morally upright capitalism, while the latter argue that the market is the only morality.

4. Both are founded on the moral principles of altruism; but the latter conceive of the market as a force too mystical for the former to comprehend.

13. The author makes all of the following arguments in the passage, EXCEPT:

1. The failure of the French Revolution was because of its betrayal by the new class of politicians who emerged from it.

2. Individualist anarchism is actually constituted of many streams, all of which focus on the autonomy of the individual.

3. The popular perception of anarchism as espousing lawlessness and violence comes from a mainstream mistrust of collectivism.

4. For anarchists, the state is the enemy because all states apply violence and terror to maintain their control.

14. The author believes that the new ruling class of politicians betrayed the principles of the French Revolution, but does not specify in what way. In the context of the passage, which statement below is the likeliest explanation of that betrayal?

1. The new ruling class struck a deal with the old ruling class to share power between them.

2. The new ruling class rode to power on the strength of the workers' revolutionary anger, but then turned to oppress that very class.

3. The new ruling class was constituted mainly of anarchists who were against the destructive impact of the Revolution on the market.

4. The anarchists did not want a new ruling class, but were not politically strong enough to stop them.

Passage - IV

Few realise that the government of China, governing an empire of some 60 million people during the Tang dynasty (618–907), implemented a complex financial system that recognized grain, coins and textiles as money. . . . Coins did have certain advantages: they were durable, recognisable and provided a convenient medium of exchange, especially for smaller transactions. However, there were also disadvantages. A continuing shortage of copper meant that government mints could not produce enough coins for the entire empire, to the extent that for most of the dynasty's history, coins

constituted only a tenth of the money supply. One of the main objections to calls for taxes to be paid in coin was that peasant producers who could weave cloth or grow grain – the other two major currencies of the Tang – would not be able to produce coins, and therefore would not be able to pay their taxes. . . .

As coins had advantages and disadvantages, so too did textiles. If in circulation for a long period of time, they could show signs of wear and tear. Stained, faded and torn bolts of textiles had less value than a brand new bolt. Furthermore, a full bolt had a particular value. If consumers cut textiles into smaller pieces to buy or sell something worth less than a full bolt, that, too, greatly lessened the value of the textiles. Unlike coins, textiles could not be used for small transactions; as [an official] noted, textiles could not "be exchanged by the foot and the inch" . . .

But textiles had some advantages over coins. For a start, textile production was widespread and there were fewer problems with the supply of textiles. For large transactions, textiles weighed less than their equivalent in coins since a string of coins . . . could weigh as much as 4 kg. Furthermore, the dimensions of a bolt of silk held remarkably steady from the third to the tenth century: 56

cm wide and 12 m long . . . The values of different textiles were also more stable than the fluctuating values of coins. . . .

The government also required the use of textiles for large transactions. Coins, on the other hand, were better suited for smaller transactions, and possibly, given the costs of transporting coins, for a more local usage. Grain, because it rotted easily, was not used nearly as much as coins and textiles, but taxpayers were required to pay grain to the government as a share of their annual tax obligations, and official salaries were expressed in weights of grain. . . .

In actuality, our own currency system today has some similarities even as it is changing in front of our eyes. . . . We have cash – coins for small transactions like paying for parking at a meter, and banknotes for other items; cheques and debit/credit cards for other, often larger, types of payments. At the same time, we are shifting to electronic banking and making payments online. Some young people never use cash [and] do not know how to write a cheque . . .

15. According to the passage, the modern currency system shares all the following features with that of the Tang, EXCEPT that:

1. it uses different materials as currency.

2. it is undergoing transformation.

3. its currencies fluctuate in value over time.

4. it uses different currencies for different situations.

16. When discussing textiles as currency in the Tang period, the author uses the words “steady” and “stable” to indicate all of the following EXCEPT:

1. reliable quality.

2. reliable supply.

3. reliable transportation.

4. reliable measurements.

17. During the Tang period, which one of the following would not be an economically sound decision for a small purchase in the local market that is worth one-eighth of a bolt of cloth?

1. Cutting one-eighth of the fabric from a new bolt to pay the amount.

2. Using coins issued by the government to make the payment.

3. Making the payment with the appropriate weight of grain.

4. Paying with a faded bolt of cloth that has approximately the same value.

18. In the context of the passage, which one of the following can be inferred with regard to the use of currency during the Tang era?

1. Copper coins were more valuable and durable than textiles.

2. Currency that deteriorated easily was not used for official work.

3. Grains were the most used currency because of government requirements.

4. Currency usage was similar to that of modern times.

19. Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

1. For feminists, the question of how we read is inextricably linked with the question of what we read.

2. Elaine Showalter's critique of the literary curriculum is exemplary of this work.

3. Androcentric literature structures the reading experience differently depending on the gender of the reader.

4. The documentation of this realization was one of the earliest tasks undertaken by feminist critics.

5. More specifically, the feminist inquiry into the activity of reading begins with the realization that the literary canon is androcentric, and that this has a profoundly damaging effect on women readers.

20. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

For years, movies and television series like Crime Scene Investigation (CSI) paint an unrealistic picture of the "science of voices." In the 1994 movie Clear and Present Danger an expert listens to a brief recorded utterance and declares that the

speaker is “Cuban, aged 35 to 45, educated in the […] eastern United States.” The recording is then fed to a supercomputer that matches the voice to that of a suspect, concluding that the probability of correct identification is 90%. This sequence sums up a good number of misimpressions about forensic phonetics, which have led to errors in real-life justice. Indeed, that movie scene exemplifies the so-called “CSI effect”—the phenomenon in which judges hold unrealistic expectations of the capabilities of forensic science.

1. Movies and televisions have led to the belief that the use of forensic phonetics in legal investigations is robust and fool proof.

2. Voice recognition as used in many movies to identify criminals has been used to identify criminals in real life also.

3. Voice recognition has started to feature prominently in crime-scene intelligence investigations because of movies and television series.

4. Although voice recognition is often presented as evidence in legal cases, its scientific basis can be shaky.

21. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1. Tensions and sometimes conflict remain an issue in and between the 11 states in South East Asia (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste and Vietnam).

2. China's rise as a regional military power and its claims in the South China Sea have become an increasingly pressing security concern for many South East Asian states.

3. Since the 1990s, the security environment of South East Asia has seen both continuity and profound changes.

4. These concerns cause states from outside the region to take an active interest in South East Asian security.

22. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1. Relying on narrative structure alone, indigenous significances of nineteenth century San folktales are hard to determine.

2. Using their supernatural potency, benign shamans transcend the levels of the San cosmos in order to deal with social conflict and to protect material resources and enjoy a measure of respect that sets them apart from ordinary people.

3. Selected tales reveal that they deal with a form of spiritual conflict that has social implications and concern conflict between people and living or dead malevolent shamans.

4. Meaning can be elicited, and the tales contextualized, by probing beneath the narrative of verbatim, original-language records and exploring the connotations of highly significant words and phrases.

23. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

For nearly a century most psychologists have embraced one view of intelligence. Individuals are born with more or less intelligence potential (I.Q.); this potential is heavily influenced by heredity and difficult to alter; experts in measurement can determine a person's intelligence early in life, currently from paper-and-pencil measures, perhaps eventually from examining the brain in action or even scrutinizing his/her genome. Recently, criticism of this conventional wisdom has mounted. Biologists ask if speaking of a single entity called "intelligence" is coherent and question the validity of measures used to estimate heritability of a trait in humans, who, unlike plants or animals, are not conceived and bred under controlled conditions.

1. Biologists have criticised that conventional wisdom that individuals are born with more or less intelligence potential.

2. Biologists have started questioning psychologists' view of 'intelligence' as a

measurable immutable characteristic of an individual.

3. Biologists have questioned the long-standing view that 'intelligence' is a single entity and the attempts to estimate it's heritability.

4. Biologists have questioned the view that 'intelligence' is a single entity and the ways in which what is inherited.

24. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

As Soviet power declined, the world became to some extent multipolar, and Europe strove to define an independent identity. What a journey Europe has undertaken to reach this point. It had in every century changed its internal structure and invented new ways of thinking about the nature of international order. Now at the culmination of an era, Europe, in order to participate in it, felt obliged to set aside the political mechanisms through which it had conducted its affairs for three and a half centuries. Impelled also by the desire to cushion the emergent unification of Germany, the

new European Union established a common currency in 2002 and a formal political structure in 2004. It proclaimed a Europe united, whole, and free, adjusting its differences by peaceful mechanisms.

1. Europe has chosen to lower political and economic heterogeneity, in order to adapt itself to an emerging multi-polar world.

2. The establishment of a formal political structure in Europe was hastened by the unification of Germany and the emergence of a multipolar world.

3. Europe has consistently changed its internal structure to successfully adapt to the changing world order.

4. Europe has consistently changed in keeping with the changing world order and that has culminated in a united Europe.

25. together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

1. Talk was the most common way for enslaved men and women to subvert the rules of their

bondage, to gain more agency than they were supposed to have.

2. Even in conditions of extreme violence and unfreedom, their words remained ubiquitous, ephemeral, irrepressible, and potentially transgressive.

3. Slaves came from societies in which oaths, orations, and invocations carried great potency, both between people and as a connection to the all-powerful spirit world.

4. Freedom of speech and the power to silence may have been preeminent markers of white liberty in Colonies, but at the same time, slavery depended on dialogue: slaves could never be completely muted.

5. Slave-owners obsessed over slave talk, though they could never control it, yet feared its power to bind and inspire—for, as everyone knew, oaths, whispers, and secret conversations bred conspiracy and revolt.

26. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1. Man has used poisons for assassination purposes ever since the dawn of civilization, against individual enemies but also occasionally against armies.

2. These dangers were soon recognized, and resulted in two international declarations— in 1874 in Brussels and in 1899 in The Hague—that prohibited the use of poisoned weapons.

3. The foundation of microbiology by Louis Pasteur and Robert Koch offered new prospects for those interested in biological weapons because it allowed agents to be chosen and designed on a rational basis.

4. Though treaties were all made in good faith, they contained no means of control, and so failed to prevent interested parties from developing and using biological weapons.

Section - II: DI & LR

DIRECTION ***for questions 27 to 30****: Study the following table given below and answer the question that follows.*

1000 patients currently suffering from a disease were selected to study the effectiveness of treatment of four types of medicines — A, B, C and D. These patients were first randomly assigned into two groups of equal size, called treatment group and control group. The patients in the control group were not treated with any of these medicines; instead they were given a dummy medicine, called placebo, containing only sugar and starch. The following information is known about the patients in the treatment group.

a. A total of 250 patients were treated with type A medicine and a total of 210 patients were treated with type C medicine.

b. 25 patients were treated with type A medicine only. 20 patients were treated with type C medicine only. 10 patients were treated with type D medicine only.

c. 35 patients were treated with type A and type D medicines only. 20 patients were treated with type A and type B medicines only. 30 patients were treated with type

A and type C medicines only. 20 patients were treated with type C and type D medicines only.

d. 100 patients were treated with exactly three types of medicines.

e. 40 patients were treated with medicines of types A, B and C, but not with medicines of type D. 20 patients were treated with medicines of types A, C and D, but not with medicines of type B.

f. 50 patients were given all the four types of medicines. 75 patients were treated with exactly one type of medicine.

27. How many patients were treated with medicine type B?

28. The number of patients who were treated with medicine types B, C and D, but not type A was:

29. How many patients were treated with medicine types B and D only?

30. The number of patients who were treated with medicine type D was:?

DIRECTION ***for questions 31 to 36:*** *Read the information given below and answer the question that follows.*

Four institutes, A, B, C, and D, had contracts with four vendors W, X, Y, and Z during the ten calendar years from 2010 to 2019. The contracts were either multi-year contracts running for several consecutive years or single-year contracts. No institute had more than one contract with the same vendor. However, in a calendar year, an institute may have had contracts with multiple vendors, and a vendor may have had contracts with multiple institutes. It is known that over the decade, the institutes each got into two contracts with two of these vendors, and each vendor got into two contracts with two of these institutes.

The following facts are also known about these contracts.

I. Vendor Z had at least one contract in every year.

II. Vendor X had one or more contracts in every year up to 2015, but no contract in any year after that.

III. Vendor Y had contracts in 2010 and 2019. Vendor W had contracts only in 2012.

IV. There were five contracts in 2012.

V. There were exactly four multi-year contracts. Institute B had a 7-year contract, D had a 4- year contract, and A and C had one 3-year contract each. The other four contracts were single year contracts.

VI. Institute C had one or more contracts in 2012 but did not have any contract in 2011.

VII. Institutes B and D each had exactly one contract in 2012. Institute D did not have any contract in 2010.

31. In which of the following years were there two or more contracts?

1. 2015 2. 2017 3. 2018 4. 2016

32. Which of the following is true?

1. D had a contract with Y in 2019
2. B had a contract with Z in 2017
3. B had a contract with Y in 2019
4. D had a contract with X in 2011

33. In how many years during this period was there only one contract?

1. 3 2. 2 3. 5 4. 4

34. What BEST can be concluded about the number of contracts in 2010?

1. at least 3
2. at least 4
3. exactly 3
4. exactly 4

35. Which institutes had multiple contracts during the same year?

1. B only
2. A and B only
3. B and C only
4. A only

36. Which institutes and vendors had more than one contracts in any year?

1. A, B, W, and X
2. A, D, W, and Z
3. B, D, W, and X
4. B, W, X, and Z

DIRECTION ***for questions 37 to 42:*** *Read the information given below and answer the question that follows.*

In a certain board examination, students were to appear for examination in five subjects: English, Hindi, Mathematics, Science and Social Science. Due to a certain emergency situation, a few of the examinations

could not be conducted for some students. Hence, some students missed one examination and some others missed two examinations. Nobody missed more than two examinations.

The board adopted the following policy for awarding marks to students. If a student appeared in all five examinations, then the marks awarded in each of the examinations were on the basis of the scores obtained by them in those examinations.

If a student missed only one examination, then the marks awarded in that examination was the average of the best three among the four scores in the examinations they appeared for.

If a student missed two examinations, then the marks awarded in each of these examinations was the average of the best two among the three scores in the examinations they appeared for.

The marks obtained by six students in the examination are given in the table below. Each of them missed either one or two examinations.

	English	Hindi	Mathematics	Science	Social Science
Alva	80	75	70	75	60
Bithi	90	80	55	85	85
Carl	75	80	90	100	90
Deep	70	90	100	90	80
Esha	80	85	95	60	55
Foni	83	72	78	88	83

The following facts are also known.

I. Four of these students appeared in each of the English, Hindi, Science, and Social Science examinations.

II. The student who missed the Mathematics examination did not miss any other examination.

III. One of the students who missed the Hindi examination did not miss any other examination.

The other student who missed the Hindi examination also missed the Science examination.

37. Who among the following did not appear for the Mathematics examination?

1. Carl 2. Alva 3. Foni 4. Esha

38. Which students did not appear for the English examination?

1. Carl and Deep 2. Esha and Foni

3. Alva and Bithi 4. Cannot be determined?

39. What BEST can be concluded about the students who did not appear for the Hindi examination?

1. Alva and Esha

2. Alva and Deep

3. Deep and Esha

4. Two among Alva, Deep and Esha

40. What BEST can be concluded about the students who missed the Science examination?

1. Alva and Bithi

2. Deep and Bithi

3. Alva and Deep

4. Bithi and one out of Alva and Deep

41. How many out of these six students missed exactly one examination?

42. For how many students can we be definite about which examinations they missed?

DIRECTION ***for questions 43 to 46:*** *Read the information given below and answer the question that follows.*

The local office of the APP-CAB company evaluates the performance of five cab drivers, Arun, Barun, Chandan, Damodaran, and Eman for their monthly payment based on ratings in five different parameters (P1 to P5) as given below:

P1: timely arrival

P2: behaviour

P3: comfortable ride

P4: driver's familiarity with the route

P5: value for money

Based on feedback from the customers, the office assigns a rating from 1 to 5 in each of these parameters. Each rating is an integer from a low value of 1 to a high value of 5. The final rating of a driver is the average of his ratings in these five parameters. The monthly payment of the drivers has two parts – a fixed payment and final rating-based bonus. If a driver gets a rating of 1 in any of

the parameters, he is not eligible to get bonus. To be eligible for bonus a driver also needs to get a rating of five in at least one of the parameters.

The partial information related to the ratings of the drivers in different parameters and the monthly payment structure (in rupees) is given in the table below:

	P1	P2	P3	P4	P5	Fixed Payment	Bonus
Arun				4		Rs. 1000	Rs. 250 × Final Rating
Barun	3					Rs. 1200	Rs. 200 × Final Rating
Chandan			2			Rs. 1400	Rs. 100 × Final Rating
Damodaran		3				Rs. 1300	Rs. 150 × Final Rating
Eman					2	Rs. 1100	Rs. 200 × Final Rating

The following additional facts are known.

1. Arun and Barun have got a rating of 5 in exactly one of the parameters. Chandan has got a rating of 5 in exactly two parameters.
2. None of drivers has got the same rating in three parameters.

43. If Damodaran does not get a bonus, what is the maximum possible value of his final rating?

1. 3.6 2. 3.8 3. 3.2 4. 3.4

44. If Eman gets a bonus, what is the minimum possible value of his final rating?

1. 3.4 2. 2.8 3. 3.0 4. 3.2

45. If all five drivers get bonus, what is the minimum possible value of the monthly payment (in rupees) that a driver gets?

1. 1700 2. 1740 3. 1750 4. 1600

46. If all five drivers get bonus, what is the maximum possible value of the monthly payment (in rupees) that a driver gets?

1. 1960 2. 1950 3. 2050 4. 1900

DIRECTION ***for questions 47 to 50****: Read the information given below and answer the question that follows.*

Ten musicians (A, B, C, D, E, F, G, H, I and J) are experts in at least one of the following three percussion instruments: tabla, mridangam, and ghatam. Among them, three are experts in tabla but not in mridangam or ghatam, another three are experts in mridangam but not in tabla or ghatam, and one is an expert in ghatam but not in tabla or mridangam. Further, two are experts in tabla and mridangam but not in ghatam, and one is an expert in tabla and ghatam but not in mridangam.

The following facts are known about these ten musicians.

1. Both A and B are experts in mridangam, but only one of them is also an expert in tabla.
2. D is an expert in both tabla and ghatam.
3. Both F and G are experts in tabla, but only one of them is also an expert in mridangam.
4. Neither I nor J is an expert in tabla.
5. Neither H nor I is an expert in mridangam, but only one of them is an expert in ghatam.

47. Who among the following is DEFINITELY an expert in tabla but not in either mridangam or ghatam?

1. C 2. F 3. H 4. A

48. Who among the following is DEFINITELY an expert in mridangam but not in either tabla or ghatam?

1. B 2. E 3. J 4. G

49. Which of the following pairs CANNOT have any musician who is an expert in both tabla and mridangam but not in ghatam?

1. A and B 2. F and G 3. C and E 4. C and F

50. If C is an expert in mridangam and F is not, then which are the three musicians who are experts in tabla but not in either mridangam or ghatam?

1. E, F and H 2. C, E and G

3. E, G and H 4. C, G and H

Section - III: Quantitative Ability

51. Among 100 students, x_1 have birthdays in January, x_2 have birthday in February, and so on. If x_0 = max (x_1, x_2,……., x_{12}), then the smallest possible value of x_0 is

1. 12 2. 9 3. 8 4.10

52. A gentleman decided to treat a few children in the following manner. He gives half of his total stock of toffees and one extra to the first child, and then the half of the remaining stock along with one extra to the second and continues giving away in this fashion. His total stock exhausts after he takes care of 5 children. How many toffees were there in his stock initially?

53. Veeru invested Rs 10000 at 5% simple annual interest, and exactly after two years, Joy invested Rs 8000 at 10% simple annual interest. How many years after Veeru's investment, will their balances, i.e., principal plus accumulated interest, be equal?

54. If y is a negative number such that $2^{y^2 \log_3 5} = 5^{\log_2 3}$, then y equals

1. $-\log_2 (1/5)$
2. $\log_2 (1/5)$
3. $-\log_2 (1/3)$
4. $\log_2 (1/3)$

55. Leaving home at the same time, Amal reaches office at 10:15 am if he travels at 8 km/hr, and at 9:40 am if he travels at 15 km/hr. Leaving home at 9:10, at what speed, in km/hr, must be travel so as to reach office exactly at 10 am?

1. 14 2. 11 3. 13 4. 12

56. A train travelled at one-thirds of its usual speed, and hence reached the destination 30 minutes after the scheduled time. On its return journey, the train initially travelled at its usual speed for 5 minutes but then stopped for 4 minutes for an emergency. The percentage by which the train must now increase its usual speed so as to reach the destination at the scheduled time, is nearest to

1. 58 2. 61 3. 50 4. 67

57. The number of real-valued solutions of the equation $2^x + 2^{-x} = 2 - (x - 2)^2$ is

1. 1 2. 0

3. Infinite 4. 2

58. A solution, of volume 40 litres, has dye and water in the proportion 2 : 3. Water is added to the solution to change this proportion to 2 : 5. If one-fourths of this diluted solution is taken out, how many litres of dye must be added to the remaining solution to bring the proportion back to 2 : 3?

59. Let A, B and C be three positive integers such that the sum of A and the mean of B and C is 5. In addition, the sum of B and the mean of A and C is 7. Then the sum of A and B is

1. 5 2. 4 3. 7 4. 6

60. How many 3-digit numbers are there, for which the product of their digits is more than 2 but less than 7?

61. A straight road connects points A and B. Car 1 travels from A to B and Car 2 travels from B to A, both leaving at the same time. After meeting each other, they take 45 minutes and 20 minutes, respectively, to complete their journeys. If Car 1 travels at the speed of 60 km/hr, then the speed of Car 2, in km/hr, is

1. 100 2. 80 3. 90 4. 70

62. If $\log_4 5 = (\log_4 y)(\log_6 \sqrt{5})$, then y equals

63. A solid right circular cone of height 27 cm is cut into pieces along a plane parallel to its base at a height of 18 cm from the base. If the difference in volume of the two pieces is 225 cc, the volume, in cc, of the original cone is

1. 243 2. 232 3. 256 4. 264

64. Two persons are walking beside a railway track at respective speeds of 2 and 4 km per hour in the same direction. A train came from behind them and crossed them in 90 and 100 seconds, respectively. The time, in seconds, taken by the train to cross an electric post is nearest to

1. 78 2. 87 3. 75 4. 82

65. A circle is inscribed in a rhombus with diagonals 12 cm and 16 cm. The ratio of the area of circle to the area of rhombus is

1. $\frac{2\pi}{15}$ 2. $\frac{3\pi}{25}$ 3. $\frac{6\pi}{25}$ 4. $\frac{5\pi}{18}$

66. If f(5 + x) = f(5- x) for every real x, and f(x) = 0 has four distinct real roots, then the sum of these roots is

1. 10 2. 0 3. 40 4. 20

67. If x = $(4096)^{7+4\sqrt{3}}$, then which of the following equals 64?

1. $\frac{x^7}{x^{2\sqrt{3}}}$ 2. $\frac{x^{\frac{7}{2}}}{x^{\frac{4}{\sqrt{3}}}}$ 3. $\frac{x^{\frac{7}{2}}}{x^{\frac{4}{2\sqrt{3}}}}$ 4. $\frac{x^7}{x^{4\sqrt{3}}}$

68. On a rectangular metal sheet of area 135 sq in, a circle is painted such that the circle touches two opposite sides. If the area of the sheet left unpainted is two-thirds of the painted area then the perimeter of the rectangle in inches is

1. $3\sqrt{\pi}\left(5+\frac{12}{\pi}\right)$ 2. $3\sqrt{\pi}\left(\frac{5}{2}+\frac{6}{\pi}\right)$

3. $5\sqrt{\pi}\left(3+\frac{9}{\pi}\right)$ 4. $4\sqrt{\pi}\left(3+\frac{9}{\pi}\right)$

69. The number of distinct real roots of the equation $\left(x+\frac{1}{x}\right)^2-3\left(x+\frac{1}{x}\right)+2=0$ equals

70. If a, b and c are positive integers such that ab = 432, bc = 96 and c < 9, then the smallest possible value of a + b + c is

1. 59 2. 49 3. 56 4. 46

71. The area of the region satisfying the inequalities $|x| - y \le 1$, $y \ge 0$ and $y \le 1$ is

72. In a group of people, 28% of the members are young while the rest are old. If 65% of the members are literates, and 25% of the literates are young, then the percentage of old people among the illiterates is nearest to

1. 59 2. 55 3. 66 4. 62

73. The mean of all 4-digit even natural numbers of the form 'aabb', where a > 0, is

1. 5050 2. 4864 3. 5544 4. 4466

74. An alloy is prepared by mixing three metals A, B and c in the proportion 3 : 4 : 7 by volume. Weights of the same volume of the metals A, B and C are in the ratio 5 : 2 : 6. In 130 kg of the alloy, the weight, in kg, of the metal C is

1. 48 2. 70 3. 84 4. 96

75. A person spent Rs 50000 to purchase a desktop computer and a laptop computer. He sold the desktop at 20% profit and the laptop at 10% loss. If overall he made a 2% profit then the purchase price, in rupees, of the desktop is

76. How many distinct positive integer-valued solutions exist to the equation

$(x^2-7x+11)^{(x^2-13x+42)}=1$?

1. 4 2. 6 3. 8 4. 2

Answer Key & Explanation

Q. No.	Key	Explanations
1.	4	Option A is supported by lines "In the late 1960s, while studying the northern-elephant-seal population along the coasts of Mexico and California, Burney Le Boeuf and his colleagues couldn't help but notice that the threat calls of males at some sites sounded different from those of males at other sites. . . . That was the first time dialects were documented in a nonhuman mammal. . . . All the northern elephant seals that exist today are descendants of the small herd that survived on Isla Guadalupe [after the near extinction of the species in the nineteenth century]. As that tiny population grew, northern elephant seals started to recolonize former breeding locations. It was precisely on the more recently colonized islands where Le Boeuf found that the tempos of the male vocal displays showed stronger differences to the ones from Isla Guadalupe, the founder colony." Had the seals not become nearly extinct and had the descendants of the surviving herd at Isla Guadalpue not spread out and gotten

		isolated in the first place, the seals wouldn't have exhibited dialects.. Also the options takes this as a possible cause by use of words 'might' "male northern elephant seals might not have exhibited dialects had they not become nearly extinct in the nineteenth century." OPtion B is supported by lines "But the average pulse rate was changing. Immigration could have been responsible for this increase, as in the early 1970s, 43 percent of the males on Año Nuevo had come from southern rookeries that had a faster pulse rate. This led Le Boeuf and his collaborator, Lewis Petrinovich, to deduce that the dialects were, perhaps, a result of isolation over time, after the breeding sites had been recolonized. For instance, the first settlers of Año Nuevo could have had, by chance, calls with low pulse rates. ..... As the population continued to expand and the islands kept on receiving immigrants from the original population, the calls in all locations would have eventually regressed to the average pulse rate of the founder colony." (The last part - regression of calls in all locations -implies disappearance of dialects) Option C is supported by 1st lines of para 4 "At the individual level, the pulse of the calls stayed the same: A male would maintain his vocal

		signature throughout his lifetime." Option D contradicts the lines "As the population continued to expand and the islands kept on receiving immigrants from the original population, the calls in all locations would have eventually regressed to the average pulse rate of the founder colony."
2.	2	Refer lines "As the population continued to expand and the islands kept on receiving immigrants from the original population, the calls in all locations would have eventually regressed to the average pulse rate of the founder colony" Option 2 talks about situation where immigrants tempo changed to become that of resident males which would have allowed the distinctive tempo of island to continue and not become extinct Option 4 talks about opposite of option 2 hence is incorrect Option 1 is incorrect as migration still happened from other islands even if didn't happen from one island so no migration from the other island has no effect here
3.	1	Option 1 is correct and 2 and 3 incorrect Refer last lines of passage "Yet there are other differences between the males from the late 1960s and their great-great-grandsons: Modern

		males exhibit more individual diversity, and their calls are more complex. While 50 years ago the drumming pattern was quite simple and the dialects denoted just a change in tempo, Casey explained, the calls recorded today have more complex structures, sometimes featuring doublets or triplets..." Option 4 is incorrect as it doesn't answer the Q i.e. sum up the overall history
4.	3	Option 3 Refer following lines of penultimate para "This led Le Boeuf and his collaborator, Lewis Petrinovich, to deduce that the dialects were, perhaps, a result of isolation over time, after the breeding sites had been recolonized. For instance, the first settlers of Año Nuevo could have had, by chance, calls with low pulse rates . At other sites, where the scientists found faster pulse rates, the opposite would have happened—seals with faster rates would have happened to arrive first." Option 1 though factually correct doesn't answer the Q – why the call pulse rate of male northern elephant seals in the southern rookeries was faster
5.	4	Q is which if false supports arguments in the passage. Option 4 is opposite of what's stated in the

		passage Hence is the best option here Refer lines Of first para "Nouns and verbs are the two indispensable parts of writing." And of last para "Take any noun, put it with any verb, and you have a sentence. It never fails." Option 2 neither supports nor goes against the passage as women writers weren't talked about in passage. Option 3 is true hence incorrect option here. Refer lines of para 3 ""It is an old observation," he writes, "that the best writers sometimes disregard the rules of rhetoric."
6.	2	Answer would be an option which is similar. Hence the answer clearly is 2 Take any noun, put it with any verb, and you have a sentence. Take any vegetable, put some spices in it, and you have a dish. Options 1,3,4 are incorrect as nothing was added unlike in original stt
7.	1	2 and 4 are incorrect as author is not against grammar rules "Unless he is certain of doing well, [the writer] will probably do best to follow the rules."" 3 is incorrect as author isn't against rhetoric

8.	4	Options 1 and 2 are supported by lines "Must you write complete sentences each time, every time? Perish the thought. If your work consists only of fragments and floating clauses, the Grammar Police aren't going to come and take you away. Even William Strunk, that Mussolini of rhetoric, recognized the delicious pliability of language. "It is an old observation," he writes, "that the best writers sometimes disregard the rules of rhetoric." Option 3 is supported by line "since a sentence is, by definition, a group of words containing a subject (noun) and a predicate (verb);"
9.	3	Main focus of the passage is grammar Hence 3rd is the best option
10.	4	Option 4 Throughout the passage and in lines of penultimate para "It differs from state socialism in opposing the concept of any central authority." And Refer line 1 "The word 'anarchy' comes from the Greek anarkhia, meaning contrary to authority or without a ruler," Option 2 is incorrect refer lines of last para "There are, unsurprisingly, several traditions of individualist anarchism, one of them deriving from the 'conscious egoism' of the German writer Max Stirner (1806–56), and another from

		a remarkable series of 19th-century American figures"
11.	4	Options 1 and 3 are easily eliminated as they leave out anarchism Option 2 is eliminated because of word Betrayal which can't be as easily related as 'individual' in 4
12.	1	Refer last para
13.	3	Option 3 Option 4 is supported by last lines of para 3 Option 2 is supported by last para Option 1 can be inferred from lines "**anarchism arose** not only as an explanation of the gulf between the rich and the poor in any community, and of the reason why the poor have been obliged to fight for their share of a common inheritance, but **as a radical answer to the question 'What went wrong?' that followed the ultimate outcome of the French Revolution**"
14.	2	Option 2 can be inferred from para 2
15.	2	Refer line 1 of last para "In actuality, our own currency system today has some **similarities even as it is changing in front of our eyes**"
16.	3	Refer to following lines of paras 3 and 4 "But textiles had some advantages over coins. For a start, textile production was widespread

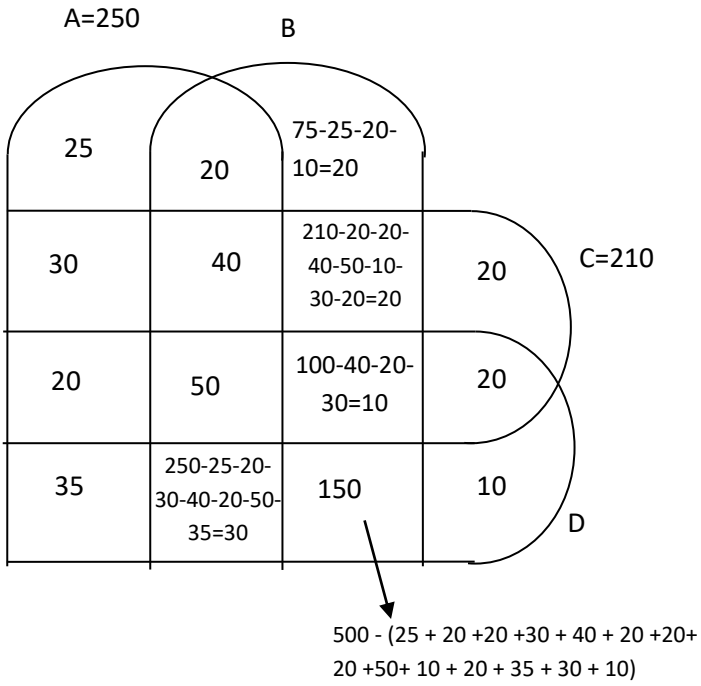
		and there were **fewer problems with the supply of textiles**. For large transactions, textiles weighed less than their equivalent in coins since a string of coins . . . could weigh as much as 4 kg. Furthermore, the **dimensions of a bolt of silk held remarkably steady** from the third to the tenth century: 56 cm wide and 12 m long . . . **The values of different textiles were also more stable** than the fluctuating values of coins. . . . The government also required the use of textiles for large transactions. Coins, on the other hand, were better suited for smaller transactions, and possibly, given the costs of transporting coins, for a more local usage. Grain, because it rotted easily, was not used nearly as much as coins and textiles, but taxpayers were required to pay grain to the government as a share of their annual tax obligations, and official salaries were expressed in weights of grain. . . .”
17.	1	Refer lines “Stained, faded and torn bolts of textiles had less value than a brand new bolt. Furthermore, a full bolt had a particular value. If consumers cut textiles into smaller pieces to buy or sell something worth less than a full bolt, that, too, greatly lessened the value of the textiles”.

18.	4	Refer following line of last para "In actuality, our own currency system today has some similarities" Option 2 is incorrect as grains, though they rotted easily, were used as currency Option 3 is incorrect Refer following line of penultimate para 'The government also required the use of textiles for large transactions.'
19.	3	SR 1542 1-5 are linked by 'more specifically' 5-4 this realization' in 4 refers to "**the literary canon is androcentric**" in 5 2 closes the para by giving an example 3 though looks related doesn't fit into the para
20.	1	Option 2 takes a positive tone while para calls the expectations from forensic phonetics unrealistic Option 3 is incorrect as it leaves out that the expectations from forensic phonetics unrealistic Option 4 leaves out the part where judges have unrealistic expectations because of movies and TV series
21.	3124	3 is the most generic stt so comes first. 3-12 'Tensions and sometimes conflict **remain**

		an issue' in 1 exemplifies 'continuity in 3' And 'China's rise' exemplifies 'profound changes' in 3 1-4 States from outside take interest because of "China's rise" in 1
22.	1432	1 is the most generic stt so comes first 1-4 4 explains how significance can be understood - by probing beneath the narrative of verbatim 4-3 when tales are probed by method stated in 4, Selected tales reveal that they deal with a form of spiritual conflict 3-2 are linked by Shamans introduced in 3
23.	3	Option 1 captures only 1st lines of the para Option 2 talks about immutable but leaves out heredity Option 4 is factually incorrect as biologists aren't questioning "ways in which that is inherited."
24.	1	Option 2 talks only of politics leaves out economics Option 3 is more generic as compared to option 1. Option 1 correctly captures "lower political and economic heterogeneity" instead of just **changing** internal structure and "emerging multi-polar world" instead of "**changing** world

		order" in 3 Option 4 is too generic esp when compared to option 1. Option 1 talks of "emerging multi-polar world" instead of "**changing** world order" in option 4. Also, "a united Europe" gives an impression that complete Europe has united which is an inference not warranted by the para
25.	3	3 talks about spirit world which isn't talked about in any other stt 4215 4-2 2 exemplifies how even in the most extreme circumstances slaves couldn't be muted 1-5 1 gives reason why slave owners obsessed over slave talk because Talk was the most common way for enslaved men and women to subvert the rules of their bondage, to gain more agency than they were supposed to have.
26.	1324	The stts are arranged chronologically 1 has 'dawn of civilization' as the time frame 1 is also the most generic stt and also introduces topic under discussion – poison/biological weapons 3-2 'these dangers' in 2 is referring to stt 3 2-4 2 and 4 are linked as both talk about nations working together through declarations in 2 and 4 talks about treaties

27-30. From instruction we can say that these are 500 patients in treatment group and 500 patients in control group.



27.	340	20 + 20 + 40 + 20 + 50 + 10 + 30 + 150 = 340
28.	10	10
29.	150	150
30.	325	20 + 50 + 10 + 20 + 35 + 30 + 150 + 10 = 325

31-36. Given that each institute have contract with two vendors. From I, II, and III facts given,
we have

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
X	X	X	X	X	X				
Y									Y
		W							
		W							

From the IV fact, we can say in 2012 there are five contracts. This means out of Z and X, one must be double.
If Z is double then the contract can be split into 3 years and 8 years which is not possible as given contract can be 7 years contract, 4 years contract, 3 years contract or one year contract.
∴ From 2012 to 2015, x will have a four year contract with D, as D did not have any contract in 2010.
C did not have a contract in 2011
∴ A will have contract with C from 2010 to 2012 and C must from contract with Z from 2017 to 2019 and initial 7 years contract of B with Z.
Since B and D have only one contract in 2012, ∴ W will have contract with A and C in 2012.
A and C already made contract with 2 vendors, we are left with B & D for single year contract. D didn't have contract in 2010.
∴ D will have contract in 2019 with Y and B will have contract with Y in 2010.

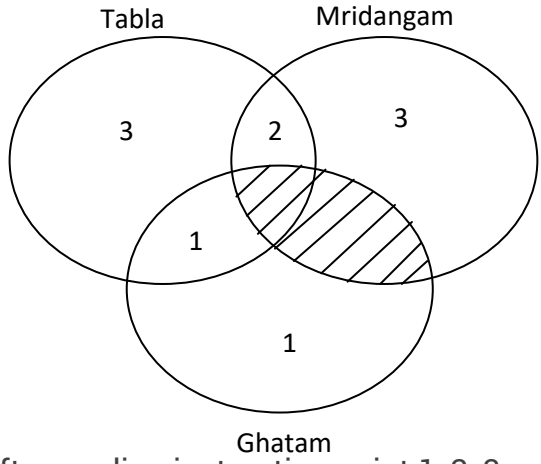
Therefore the final table,

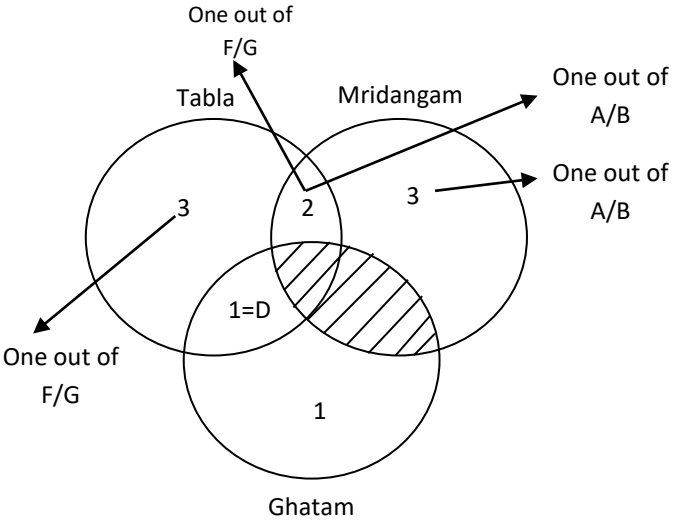
2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
BZ	BZ	BZ	BZ	BZ	BZ	BZ	CZ	CZ	CZ
AX	AX	AX							
		DX	DX	DX	DX				
BY		CW							DY
		AW							

31.	1	2015 (BZ and DX)
32.	1	D had a contract with Y in 2019
33.	1	3 (2016, 2017, 2018)
34.	3	Exactly 3
35.	2	A and B only (In 2010 ⇒ BZ and BY, In 2012 ⇒ AX and AW)
36.	1	A, B, W and X
37.	1	Average cannot be maximum or minimum. Given that the student who missed mathematics exam didn't miss any other exam. ∴ If Alva miss mathematics then Alva's average = $\frac{80+75+75}{3}$ that's not equal to 70 ∴ Alva eliminated, if Foni miss Mathematics, then Foni average (of best 3) = $\frac{88+83+83}{3}$ Which is not equal to 78. ∴ Foni is eliminated. We can see that Esha got maximum marks in mathematics (which is not possible if she

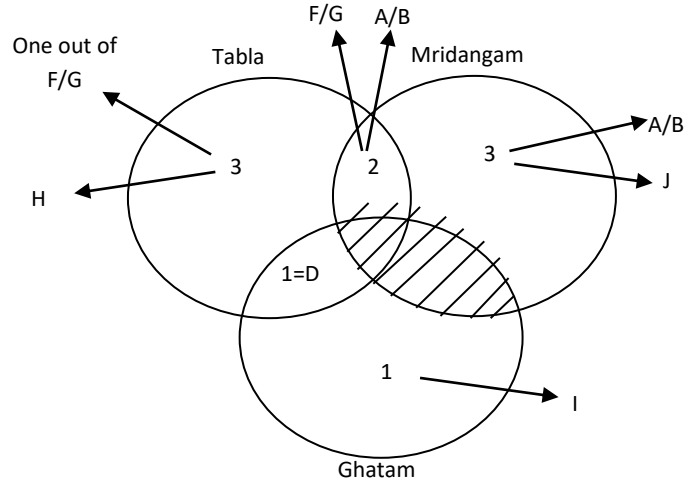
		misses mathmatics, as the missed exam is the average of remaining subjects). ∴ Carl will be the right answer as, Carl average = $\frac{100+90+80}{3}$ = 90 Which is equal to mathematics score.
38.	2	As the marks in the missing exam in the average of the remaining marks (according to different condition) and we know average can neither be least nor maximum. ∴ Alva Bithi, Carl and Deep are eliminated. ∴ Answer will be Esha and Foni
39.	2	Let's check for Esha only, by checking for Esha only we can eliminate all the wrong options. There are two cases with the Hindi; Case I ⇒ only miss Hindi exam ∴ score for Hindi for Esha = $\frac{95+80+60}{3}$ = 78.33 ∴ Not equal to 85. Not satisfied Case II ⇒ miss Hindi and Science both. Not possible as score isdiffernt for Hindi and Science. ∴ Alva and Deep will be the answer
40.	4	From the table, we can see Bithi missed the Science paper definitely but we are not sure of Alva and Deep. One out of Alva and Deep will definitely miss the Science exam
41.	3	We can see that Esha, Carl and one out of Alva or Deep missed one examination

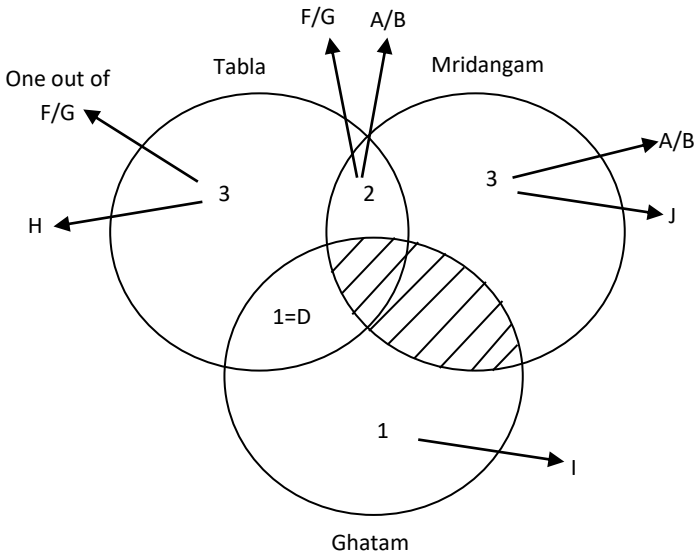
42.	4	We are definite about Bithi, Carl, Esha and Foni
43.	1	We have to maximize the rating of Damodaran, taking care that he did not get the bonus. ∴ Damodaran = 5 +5 + 3 +4+ 1 = 18 ∴ Rating = 18/5 = 3.6
44.	3	We have to minimize the rating of Eman, taking care that Eman will get bonus. ∴ Eman = 5 + 3 + 3 + 2 + 2 = 15 ∴ Rating = 15/5 = 3.0
45.	1	As, we have to find the minimum possible value of monthly payment is mean we need to find the payment of ill the drivers, keeping their rating minimum and all drivers will get the bonus. Arun = 5 + 2 + 2 + 4 3 + = 16. Arun Rating = 16/5 = 3.2 ∴ Arun payment = 1000 + 3.2 × 250 = 1800 Barun = 3 + 5 + 2 + 2 + 3 = 15 Barun Rating = 15/5 = 3.0 ∴ Barun payment = 1200 + 200 × 3 = 1800 Chandan = 5 + 5 + 2 + 2 +3 = 17 Chandan Rating = 17/5 = 3.4 Chandan Payment = 1400+ 3.4 × 100 = 1740 Damodaran = 5 + 3 + 3 + 2 + 2 Damodaran Rating = 15/5 = 3.0 ∴ Damodaran payment = 1300 + 150× 3 = 1750 Eman = 5 + 3 + 3 + 2 +2 = 15 Eman Rating = 15/5 = 3.0 ∴ Eman Payment = 1100+ 200×3 = 1700 ∴ Eman payment will be minimum i.e. 1700

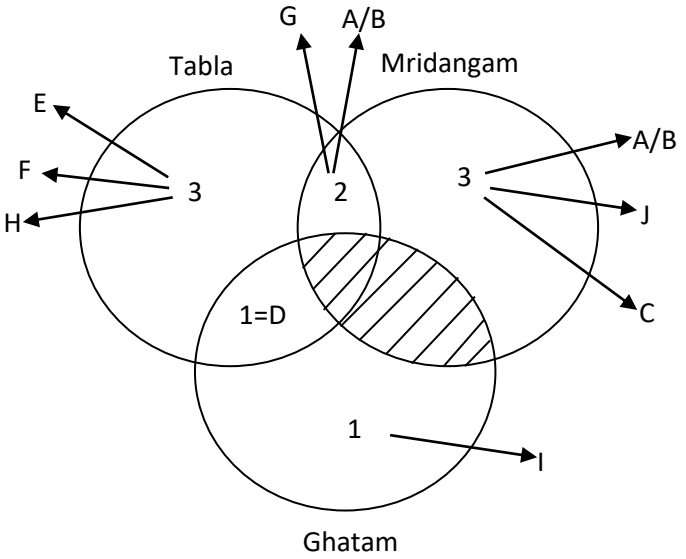
46.	1	Now we have to maximize the rating of all five drivers. Arun = 5 + 4 + 3 + 4 + 3 = 19. Rating = 19/5 = 3.80. ∴ Arun Payment = 1000 + 3.8 × 250 = 1950. Barun = 3 + 5 + 4 + 4 + 3. Rating = 19/5 = 3.80. ∴ Barun Payment = 1200 + 200 × 3.80 = 1960. Chandan = 5 + 5 + 2 + 4 + 4 = 20. Rating = 20/5 = 4.0. ∴ Chandan Payment = 1400 + 100 × 4 = 1800. Damodaran = 5 + 3 5 + 4 + 4 = 21. Rating = 21/5 = 4.2. ∴ Damodaran Payment = 1300 + 150 × 4.2 = 1930. Eamn = 5 + 5 + 4 + 4 +2 = 20. Rating = 20/5 = 4.0. ∴ Eman payment = 100 + 200 × 4 = 1900. ∴ Barun's payment is maximum i.e. 1960
47-50.	After Reading the passage  After reading instruction point 1, 2, 3	



4th point says that neither I nor J is an expert in Tabla. After combing 4th and 5th point. We can definitely say that, I must play only Ghatam, This means H must play only Tabla



	4th point says that neither I nor J is an expert in Tabla. After combing 4th and 5th point. We can definitely say that, I must play only Ghatam, This means H must play only Tabla 	
47.	3	H
48.	3	J
49.	3	It can only be from A/B, F/G ∴ C and F is the correct options

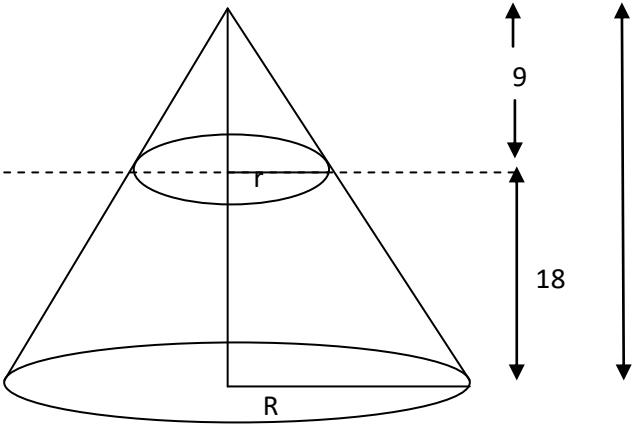
50.	1	 ∴ E, F & H are expert in Tabla only
51.	2	We want the least value of the maximum function, which is possible when the values inside the brackets are as close as possible. As number of students must be integer, therefore values of x_1, x_2..... x_{12} can be 8 or 9 (i.e 8,8,8,8,8,8,8,8,9,9,9,9). Therefore max value of x_0 is 9.
52.	62	Let the number of toffees be x. Toffees Given to first child = (x/2)+1 Toffees given to second child= (1/2) (x- (x/2) - 1) + 1 = (x/4)+(1/2) We find the symmetry in the pattern of toffees

		distribution, Therefore toffees distribution done [(x/2)+1] ,[(x/4)+(1/2)] ,[(x/8)+(1/4)] ,[(x/16)+(1/8)] ,[(x/32)+(1/16)] → [(x/2)+1] + [(x/4)+(1/2)] + [(x/8)+(1/4)] + [(x/16)+(1/8)] + [(x/32)+(1/16)] = x → (62/32) = x – (31/32)x → x=62
53.	12	Let x be the number of year after which veeru amount will be equal to Joy amount. So, (principle + Interest) for Veeru after x year = 10,000 + 10,000$\left(\frac{5x}{100}\right)$ and (principle + Interest) for Joy after (x – 2) years = 8000 + 8000 $\left(\frac{10(x-2}{100}\right)$. Accroding to given condtion, $\Rightarrow$ 10000 + 10000 $\left(\frac{5x}{100}\right)$ = 8000 + 8000 $\left(\frac{10(x-2}{100}\right)$ $\Rightarrow$ 10000 + 500x = 800 + 800x – 1600 $\Rightarrow$ x = 12

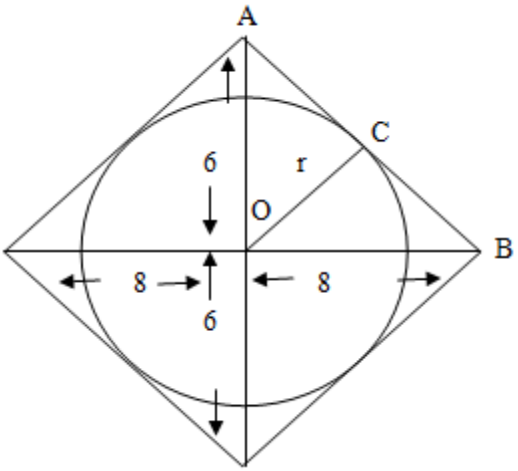
54.	4	$2^{y^2 \log_3 5} = 5^{\log_2 3}$ $\Rightarrow \log\left(2^{y^2 \log_3 5}\right) = \log\left(5^{\log_2 3}\right)$ $\Rightarrow y^2 \frac{\log 5}{\log 3} \times \log 2 = \frac{\log 3}{\log 2} \times \log 5$ $\Rightarrow y^2 = \left(\frac{\log 3}{\log 2}\right)^2 \Rightarrow y = -\left(\frac{\log 3}{\log 2}\right)$ [$\because$ *y is negative*] $y = -\log_2 3 = \log_2 \frac{1}{3}$
55.	12	As, distance covered is same with both the speed, $\therefore$ D = S × T $\Rightarrow \frac{8}{60}$ × t = $\frac{15}{60}$ × (t – 35) (where, t is the time taken in minutes by Amal when his speed is 8km/hr) $\Rightarrow$ t = 75 minutes $\therefore$ D = $\frac{8}{60}$ × 75 This means, Amal started from his house at 9:00 AM and taken 75 minutes to reach office with the speed of 8 km/hr. Now, Amal starts at 9:10 Am and wanted to reach office at 10:00 AM, i.e. is 50 minutes. We know, S = $\frac{Distance}{Time} = \frac{8 \times 60 \times 75}{50 \times 60}$ = 12 km/hr
56.	4	Let usual speed is x and time is t If speed becomes 1/3 time will become 3 times so, time taken is 3t

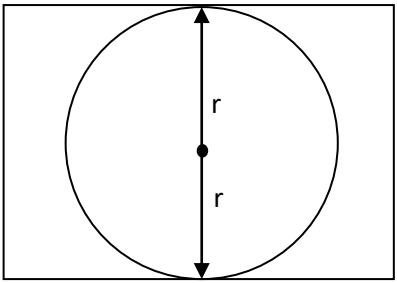
		Given that 3t –t = 30. So t is 15 min. On return journey, in 5 minutes, it will cover 1/3rd return journey, in 5 minutes, it will cover 1/3rd distance, Ti cover the remaining distance, it has 10 minutes at usual speed but as it stopped for 4 minutes, remaining time is 6 minutes. Ratio of normal time to new time is 5:3. Ratio of normal speed to new speed is 3:5. So speed increased by 2/3 or 66.77%
57.	2	$2^x + 2^{-x} = 2 - (x-2)^2$ LHS equation will always be greater than or equal to 2, whereas RHS equation will always be less than or equal to 2. This means this can only be equal when LHS and RHS both are 2, which is not possible as they will be equal to 2 at two different values of x.
58.	8	Dye : Water 40L ⇒ 2 : 3 ⇒ 16 : 24 Now, water is added and ratio becomes 2:5 but dye volume in the solution is same Let, x L ⇒ 2 : 5 ⇒ 16 : ? $\therefore \frac{2}{7} \times x = 16 \Rightarrow x = 56$

		⇒ 16 40 Now, one fourth of solution taken out ⇒ 12 30 Now, dye is added but water volume remain same and ratio become 2:3 Let y^2 ⇒ 2 : 3 ? 30 ⇒ $\frac{3}{5} \times y = 30 \Rightarrow y = 50$ ∴ 50L ⇒ 2 : 3 ⇒ 20 30 This means 8L dye is added.
59.	4	A + $\frac{B+C}{2}$ = 5 ⇒ 2A + B+C = 10 ..... (1) B + $\frac{A+C}{2}$ = 7 ⇒ 2B + A+C = 14 .....(2) (2) – (1) ⇒ B – A = 4 This means sum of A and B must be greater than 4 and it should also be even because if the sum of A and B will be odd then value of A and B will not be integer. Therefore, only one option ⇒ A + B = 6
60.	21	113, 114, 115, 116, 122 $\frac{3!}{2!}$ = 3 cases for each number. 123 ⇒ 3! = 6 cases for 123. ∴ Total = 15 + 6 = 21
61.	3	Time taken to meet together will be the square root of the product of time taken to reach their

		destination after the meeting point. i.e., t = $\sqrt{45 \times 20}$ = 30 minutes Distance = Speed × time $\Rightarrow \frac{60}{60} \times (30+ 45) = \frac{S_2}{60} \times (30 + 20) \Rightarrow S_2 = \frac{60}{50} \times 75 \Rightarrow S_2 = 90$ km/hr
62.	36	$\text{Log}_4 5 = (\log_4 y)(\log_6 \sqrt{5})$ $\Rightarrow \frac{\log 5}{\log y} = \log_6 \sqrt{5}$ $\Rightarrow \log_y 5 = \log_6 \sqrt{5} \Rightarrow \log_y 5 = 2\log_6^2 \sqrt{5}$ $\Rightarrow \log_y 5 = \log_{36} 5$ $\Rightarrow y = 36$
63.	1	 We know, $\frac{27}{R} = \frac{9}{r}$

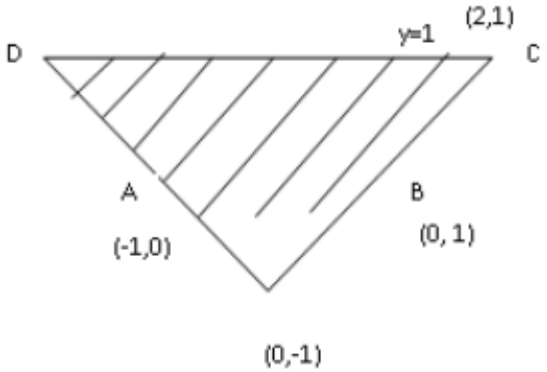
		$\Rightarrow r = \frac{R}{3}$. Given, $\frac{1}{3}\pi\left[R^2 \times 27 - r^2 \times 9\right] - \frac{1}{3}\pi[r^2 \times 9] = 225$ $\Rightarrow \frac{1}{3}\pi R^2[25] = 225$ $\Rightarrow \frac{1}{3}\pi R^2 \times 27 = \frac{225}{25} \times 27$ $\Rightarrow$ Volume of cone = 243
64.	4	Time taken Relative speed Length of train $\rightarrow$ 90 $\rightarrow$ S - 2 Length of train $\rightarrow$ 100 $\rightarrow$ S - 4 Length of train $\rightarrow$? $\rightarrow$ S $\therefore \frac{S-2}{S-4} = \frac{100}{90}$ $\Rightarrow$ 9S - 18 = 10S - 40 $\Rightarrow$ S = 22 $\therefore$ time taken $= \frac{\text{Distance}}{\text{Speed}}$ $= \frac{90 \times 20}{22}$ = 81.81 $\approx$ 82

65.	3	 By Pythagoras, AB will be = 10 cm Now, area of Δ AOB = ½ × 6 / 8 Also ΔAOB = ½ × 10 × OC ⇒ ½ × 6 × 8 = ½ × 10 × OC ⇒ 4.8cm = r . $\frac{\text{Area of circle}}{\text{Area of Rhombus}} = \frac{\pi(4.8)^2}{\frac{1}{2}\times 12\times 16} = \frac{6}{25}\pi$
66.	4	f(5 + x) = f(5- x) $x \to x - 5$ ⇒ f(5 + x - 5) = f(5- x + 5) ⇒ f (x) = f (10 - x) Given, f (x) = 0 ∴ Also, f (10 - x) = 0 Given that these are four distinct solutions ⇒ f (α) = 0, f (β) = 0 ⇒ f (10 - α) = 0, f (10 - β) = 0 Sum of these roots = α + β + 10 - α + 10 - β = 20

67.	3	$x = (4096)^{7+4\sqrt{2}} \Rightarrow x = (2^6)^{2(7+4\sqrt{3})}$ $\Rightarrow x = (64)^{14+8\sqrt{3}}$ $\Rightarrow (x)^{\frac{1}{14+8\sqrt{3}}} = 64$ $\Rightarrow (x)^{\frac{14-8\sqrt{3}}{4}} = 64$ $\Rightarrow x^{\left(\frac{7}{2}-2\sqrt{3}\right)} = 64$ $\Rightarrow \frac{x^{\frac{7}{2}}}{x^{2\sqrt{3}}} = 64$
68.	1	 Let the area of circle be x $\Rightarrow x + \frac{2}{3}x = 135$ $\Rightarrow x = \frac{135 \times 3}{5} \Rightarrow x = 81 \Rightarrow \pi r^2 = 81$ (where, r is radius of circle) $\Rightarrow r = \frac{9}{\sqrt{\pi}}$

		$\Rightarrow 2r = \frac{18}{\sqrt{\pi}} \Rightarrow$ (2r). (other side of rectangle = 135 (let, ℓ be the other side of rectangle) $\ell = \frac{135}{18}\sqrt{\pi}$ $\ell = \frac{15\sqrt{\pi}}{2}$ Perimeter = 2 (ℓ + b) $= 2\left(\frac{15}{2}\sqrt{\pi} + \frac{18}{\sqrt{\pi}}\right)$ $= 3\pi\left(5 + \frac{12}{\pi}\right)$
69.	1	Let, $x + \frac{1}{x} = y$ $\Rightarrow y^2 - 3y + 2 = 0$ $\Rightarrow y = \frac{3 \pm \sqrt{9 - 4.1.2}}{2}$ = 2, 1 $\therefore x + \frac{1}{x} = 2$; $x + \frac{1}{x} = 1$ $\Rightarrow x^2 + 1 - 2x = 0$; $\Rightarrow x^2 + 1 - x = 0$ $\Rightarrow x = \frac{2 \pm \sqrt{4 - 4.1.1}}{2}$; $\Rightarrow x = \frac{1 \pm \sqrt{1 - 4.1.1}}{2}$ = 1 ; Imaginary root $\therefore$ x = 1. Only one real root

70.	4	Case I ⇒ when C = 8 ⇒ bc = 96 ⇒ b = 12 ∴ ab = 432 ⇒ a = 36 ⇒ a + b + c = 8 + 12 + 36 = 56 Case II ⇒ when C = 7 ⇒ bc = 96 ⇒ b will not be integer ∴ c = 7 not possible Case III ⇒ when C = 6 ⇒ bc = 96 ⇒ b = 16 ∴ ab = 432 ⇒ a = 432/16 = 27 ⇒ a + b + c = 49 Case IV ⇒ C = 5 (not possible) because b will not be integer Case V ⇒ C = 4 ∴ bc = 96 ⇒ b = 24 ∴ ab = 432 ⇒ a = 432/24 = 18 ∴ a + b + c = 46 No, need to check further, of 46 is the least option given
71.	3	$\|x\| - y \le 1, y \ge 0, y \le 1$ If x > 0 ⇒ x − y = 1 ..... (1) And x < 0 ⇒ x − y = 1 Or x + y = -1 ..... (2) Put x = 0 in (1), y = -1 Put y = 0 in (1) x = 1 Put y = 1 in (1), x = 2

		Put x = 0 in (2), y = -1 Y = 0 in (2), x = -1 Y = 1 in (2), x = -2 Shaded area is trapezium ½ [2 + 4] × 1 = 35q.units 
72.	3	65% lit. 35% Illiterates ↓ 25% 16.25% young Given, 28% are young in which 16.25% are literates (from above) and 11.75% are illiterates. ∴ out of 35% illiterates 23.25% are old, that means $\left(\frac{23.25}{35}\times 100\right)^{\%}$ ⇒ 66.428% old illiterates
73.	3	aa bb a > 0 So, numbers are

		1100 2200 1122 2222 1144 2244 1166 2266 1188 2288 ↓ ↓ Mean Mean and so on 1144 2244 Average of 1144, 2244, 3344, 4444, 5544, 6644, 7744, 8844, 9944 is 5544
74.	3	A B C Volume 3 4 7 Weight of volume 5 2 6 Weight 15 8 42 ∴ C's weight = $\frac{42}{(15+8+42)}$ × 130 = 84 kg
75.	20000	Let the purchase price of develop be x ∴ 1.2x + 0.9 (50000-x) = 1.02 × 50000 ⇒ 0.3x + 45000 = 51000 ⇒ x = $\frac{6000}{3}\times 10 \Rightarrow$ x = 20,000
76.	2	$\left(x^2-7x+11\right)^{x^2+3x+42}=1$ As $a^0 = 1$ ⇒ $x^2 - 13x + 42 = 0 \Rightarrow x = 6, 7$ Also, $x^2 - 7x + 11 = 1$, $x^2 - 7x + 10 = 0$ ⇒ x = 2, 5 Also, $x^2 - 7x + 11 = -1$, $x^2 - 7x + 12 = 0$ ⇒ x = 3, 4

Section - I: Verbal Ability

DIRECTION ***for the questions 1 to 18:*** *The passage below is accompanied by a set of questions. Choose the best answer to each question.*

Passage - I

174 incidents of piracy were reported to the International Maritime Bureau last year, with Somali pirates responsible for only three. The rest ranged from the discreet theft of coils of rope in the Yellow Sea to the notoriously ferocious Nigerian gunmen attacking and hijacking oil tankers in the Gulf of Guinea, as well as armed robbery off Singapore and the Venezuelan coast and kidnapping in the Sundarbans in the Bay of Bengal. For [Dr. Peter] Lehr, an expert on modern-day piracy, the phenomenon's history should be a source of instruction rather than entertainment, piracy past offering lessons for piracy present. . . .

But . . . where does piracy begin or end? According to St Augustine, a corsair captain once told Alexander the Great that in the forceful acquisition of power and wealth at sea, the difference between an emperor and a pirate was simply one of scale. By this logic, European empire-builders were the most successful pirates of all time. A

more eclectic history might have included the conquistadors, Vasco da Gama and the East India Company. But Lehr sticks to the disorganised small fry, making comparisons with the renegades of today possible.

The main motive for piracy has always been a combination of need and greed. Why toil away as a starving peasant in the 16th century when a successful pirate made up to £4,000 on each raid? Anyone could turn to freebooting if the rewards were worth the risk . . . .

Increased globalisation has done more to encourage piracy than suppress it. European colonialism weakened delicate balances of power, leading to an influx of opportunists on the high seas. A rise in global shipping has meant rich pickings for freebooters. Lehr writes: “It quickly becomes clear that in those parts of the world that have not profited from globalization and modernisation, and where abject poverty and the daily struggle for survival are still a reality, the root causes of piracy are still the same as they were a couple of hundred years ago.” . . .

Modern pirate prevention has failed. After the French yacht Le Gonant was ransomed for $2million in 2008, opportunists from all over Somalia flocked to the coast

for a piece of the action. . . . A consistent rule, even today, is there are never enough warships to patrol pirate-infested waters. Such ships are costly and only solve the problem temporarily; Somali piracy is bound to return as soon as the warships are withdrawn. Robot shipping, eliminating hostages, has been proposed as a possible solution; but as Lehr points out, this will only make pirates switch their targets to smaller carriers unable to afford the technology.

His advice isn't new. Proposals to end illegal fishing are often advanced but they are difficult to enforce. Investment in local welfare put a halt to Malaysian piracy in the 1970s, but was dependent on money somehow filtering through a corrupt bureaucracy to the poor on the periphery. Diplomatic initiatives against piracy are plagued by mutual distrust: the Russians execute pirates, while the EU and US are reluctant to capture them for fear they'll claim asylum.

1. The author ascribes the rise in piracy today to all of the following factors EXCEPT:

1. decreased surveillance of the high seas.

2. the growth in international shipping with globalisation.

3. the high rewards via ransoms for successful piracy attempts.

4. colonialism's disruption of historic ties among countries.

2. "Why toil away as a starving peasant in the 16th century when a successful pirate made up to £4,000 on each raid?" In this sentence, the author's tone can best be described as being:

1. indignant, at the scale of wealth successful pirates could amass in medieval times.

2. ironic, about the reasons why so many took to piracy in medieval times.

3. analytical, to explain the contrasts between peasant and pirate life in medieval England.

4. facetious, about the hardships of peasant life in medieval England.

3. "A more eclectic history might have included the conquistadors, Vasco da Gama and the East India Company. But Lehr sticks to the disorganised small fry . . ." From this statement we can infer that the author believes that:

1. Vasco da Gama and the East India Company laid the ground for modern piracy.

2. Lehr does not assign adequate blame to empire builders for their past deeds.

3. the disorganised piracy of today is no match for the organised piracy of the past.

4. colonialism should be considered an organised form of piracy.

4. We can deduce that the author believes that piracy can best be controlled in the longrun:

1. through the extensive deployment of technology to track ships and cargo.

2. through lucrative welfare schemes to improve the lives of people in affected regions.

3. if we eliminate poverty and income disparities in affected regions.

4. through international cooperation in enforcing stringent deterrents

Passage - II

In a low-carbon world, renewable energy technologies are hot business. For investors looking to redirect funds, wind turbines and solar panels, among other technologies, seem a straightforward choice. But renewables need to be further scrutinized before being championed as forging a path toward a low-carbon future. Both the direct and indirect impacts of renewable energy must be examined to ensure that a climate-smart future does not intensify social and environmental harm. As renewable energy production requires land, water, and labor, among other inputs, it imposes costs on people and the environment. Hydropower projects, for instance, have led to community dispossession and exclusion . . .Renewable energy supply chains are also intertwined with mining, and their technologies contribute to growing levels of electronic waste . . . Furthermore, although renewable energy can be produced and distributed through small-scale, local systems, such an approach might not generate the high returns on investment needed to attract capital.

Although an emerging sector, renewables are enmeshed in long-standing resource extraction through their dependence on minerals and metals . . . Scholars

document the negative consequences of mining . . . even for mining operations that commit to socially responsible practices[:] “many of the world’s largest reservoirs of minerals like cobalt, copper, lithium,[and] rare earth minerals”—the ones needed for renewable technologies—“are found in fragile states and under communities of marginalized peoples in Africa, Asia, and Latin America. ”Since the demand for metals and minerals will increase substantially in a renewable-powered future . . . this intensification could exacerbate the existing consequences of extractive activities.

Among the connections between climate change and waste, O’Neill . . . highlights that “devices developed to reduce our carbon footprint, such as lithium batteries for hybrid and electric cars or solar panels[,] become potentially dangerous electronic waste at the end of their productive life.” The disposal of toxic waste has long perpetuated social injustice through the flows of waste to the Global South and to marginalized communities in the Global North . ..

While renewable energy is a more recent addition to financial portfolios, investments in the sector must be considered in light of our understanding of capital accumulation. As agricultural finance reveals, the

concentration of control of corporate activity facilitates profit generation. For some climate activists, the promise of renewables rests on their ability not only to reduce emissions but also to provide distributed, democratized access to energy . . .But Burke and Stephens . . . caution that "renewable energy systems offer a possibility but nota certainty for more democratic energy futures." Small-scale, distributed forms of energy are only highly profitable to institutional investors if control is consolidated somewhere in the financial chain. Renewable energy can be produced at the household or neighborhood level. However, such small-scale, localized production is unlikely to generate high returns for investors. For financial growth to be sustained and expanded by the renewable sector, production and trade in renewable energy technologies will need to be highly concentrated, and large asset management firms will likely drive those developments.

5. Which one of the following statements, if false, could be seen as best supporting the arguments in the passage?

1. Renewable energy systems have little or no environmental impact.

2. Renewable energy systems are as expensive as non-renewable energy systems.

3. Renewable energy systems are not as profitable as non-renewable energy systems.

4. The production and distribution of renewable energy through small-scale, local systems is not economically sustainable.

6. All of the following statements, if true, could be seen as supporting the arguments inthe passage, EXCEPT:

1. One reason for the perpetuation of social injustice lies in the problem of the disposal of toxic waste.

2. Marginalised people in Africa, Asia and Latin America have often been the main sufferers of corporate mineral extraction projects.

3. The example of agricultural finance helps us to see how to concentrate corporate activity in the renewable energy sector.

4. The possible negative impacts of renewable energy

7. Which one of the following statements, if true, could be an accurate inference from the first paragraph of the passage?

1. The author has reservations about the consequences of non-renewable energy systems.

2. The author does not think renewable energy systems can be as efficient as non-renewable energy systems.

3. The author's only reservation is about the profitability of renewable energy systems.

4. The author has reservations about the consequences of renewable energy systems.

8. Which one of the following statements best captures the main argument of the last paragraph of the passage?

1. Renewable energy systems are not democratic unless they are corporate-controlled.

2. The development of the renewable energy sector is a double-edged sword.

3. Renewable energy produced at the household or neighbourhood level is more efficient than mass-produced forms of energy.

4. Most forms of renewable energy are not profitable investments for institutional investors.

9. Based on the passage, we can infer that the author would be most supportive of whichone of the following practices?

1. The study of the coexistence of marginalised people with their environments.

2. Encouragement for the development of more environment-friendly carbon-based fuels.

3. More stringent global policies and regulations to ensure a more just system of toxic waste disposal.

4. The localised, small-scale development of renewable energy systems

Passage - III

The claims advanced here may be condensed into two assertions: [first, that visual] culture is what images, acts of seeing, and attendant intellectual, emotional, and perceptual sensibilities do to build, maintain, or transform the worlds in which people live. [And second, that the]study of visual culture is the analysis and interpretation of images and the ways of seeing (orgazes) that configure the agents, practices,

conceptualities, and institutions that put images to work. . . .

Accordingly, the study of visual culture should be characterized by several concerns. First, scholars of visual culture need to examine any and all imagery – high and low, art and nonart.. . . They must not restrict themselves to objects of a particular beauty or aesthetic value. Indeed, any kind of imagery may be found to offer up evidence of the visual construction of reality. . . .

Second, the study of visual culture must scrutinize visual practice as much as images themselves, asking what images do when they are put to use. If scholars engaged in this enterprise inquire what makes an image beautiful or why this image or that constitutes a masterpiece or a work of genius, they should do so with the purpose of investigating an artist's or a work's contribution to the experience of beauty, taste, value, or genius. No amount of social analysis can account fully for the existence of Michelangelo or Leonardo. They were unique creators of images that changed the way their contemporaries thought and felt and have continued to shape the history of art, artists, museums, feeling, and aesthetic value. But study of the critical, artistic, and popular reception of works by such artists as Michelangelo and Leonardo can

shed important light on the meaning of these artists and their works form any different people. And the history of meaning-making has a great deal to do with how scholars as well as lay audiences today understand these artists and their achievements.

Third, scholars studying visual culture might properly focus their interpretative work on life worlds by examining images, practices, visual technologies, taste, and artistic style as constitutive of social relations. The task is to understand how artifacts contribute to the construction of a world. . . . Important methodological implications follow: ethnography and reception studies become productive forms of gathering information, since these move beyond the image as a closed and fixed meaning-event. . . .

Fourth, scholars may learn a great deal when they scrutinize the constituents of vision, that is, the structures of perception as a physiological process as well as the epistemological frameworks informing a system of visual representation. Vision is a socially and a biologically constructed operation, depending on the design of the human body and how it engages the interpretive devices developed by a culture in order to see intelligibly. . . . Seeing . . . operates on the foundation

of covenants with images that establish the conditions for meaningful visual experience.

Finally, the scholar of visual culture seeks to regard images as evidence for explanation, not as epiphenomena.

10. "No amount of social analysis can account fully for the existence of Michelangelo or Leonardo." In light of the passage, which one of the following interpretations of this sentence is the most accurate?

1. Socially existing beings cannot be analysed, unlike the art of Michelangelo or Leonardo which can.

2. Michelangelo or Leonardo cannot be subjected to social analysis because of their genius.

3. Social analytical accounts of people like Michelangelo or Leonardo cannot explain their genius.

4. No analyses exist of Michelangelo's or Leonardo's social accounts

11. All of the following statements may be considered valid inferences from the passage, EXCEPT:

1. visual culture is not just about how we see, but also about how our visual practice scan impact and change the world.

2. artifacts are meaningful precisely because they help to construct the meanings of the world for us.

3. understanding the structures of perception is an important part of understanding how visual cultures work.

4. studying visual culture requires institutional structures without which the structures of perception cannot be analysed.

12. "Seeing . . . operates on the foundation of covenants with images that establish the conditions for meaningful visual experience." In light of the passage, which one of the following statements best conveys the meaning of this sentence?

1. Images are meaningful visual experiences when they have a foundation of covenants seeing them.

2. Sight becomes a meaningful visual experience because of covenants of meaningfulness that we establish with the images we see.

3. The way we experience sight is through images operated on by meaningful covenants.

4. Sight as a meaningful visual experience is possible when there is a foundational condition established in images of covenants.

13. Which set of keywords below most closely captures the arguments of the passage?

1. Imagery, Visual Practices, Life worlds, Structures of Perception.

2. Visual Construction of Reality, Work of Genius, Ethnography, Epiphenomena.

3. Scholars, Social Analysis, Michelangelo and Leonardo, Interpretive Devices.

4. Visual Culture, Aesthetic Value, Lay Audience, Visual Experience.

14. Which one of the following best describes the word "epiphenomena" in the last sentence of the passage?

1. Phenomena amenable to analysis.
2. Visual phenomena of epic proportions.
3. Overarching collections of images.
4. Phenomena supplemental to the evidence.

Passage - IV

Aggression is any behavior that is directed toward injuring, harming, or inflicting pain on another living being or group of beings. Generally, the victim(s) of aggression must wish to avoid such behavior in order for it to be considered true aggression. Aggression is also categorized according to its ultimate intent. Hostile aggression is an aggressive act that results from anger, and is intended to inflict pain or injury because of that anger. Instrumental aggression is an aggressive act that is regarded as a means to an end other than pain or injury. For example, an enemy combatant may be subjected to torture in order to extract useful intelligence, though those inflicting the torture may have no real feelings of anger or animosity toward their subject. The concept of aggression is very broad, and includes many

categories of behavior (e.g., verbal aggression, street crime, child abuse, spouse abuse, group conflict, war, etc.). A number of theories and models of aggression have arisen to explain these diverse forms of behavior, and these theories/models tend to be categorized according to their specific focus. The most common system of categorization groups the various approaches to aggression into three separate areas, based upon the three key variables that are present whenever any aggressive act or set of acts is committed. The first variable is the aggressor him/herself. The second is the social situation or circumstance in which the aggressive act(s) occur. The third variable is the target or victim of aggression.

Regarding theories and research on the aggressor, the fundamental focus is on the factors that lead an individual (or group) to commit aggressive acts. At the most basic level, some argue that aggressive urges and actions are the result of inborn, biological factors. Sigmund Freud (1930) proposed that all individuals are born with a death instinct that predisposes us toa variety of aggressive behaviors, including suicide (self-directed aggression) and mental illness (possibly due to an unhealthy or unnatural suppression of aggressive urges).

Other influential perspectives supporting a biological basis for aggression conclude that humans evolved with an abnormally low neural inhibition of aggressive impulses (in comparison toother species), and that humans possess a powerful instinct for property accumulation and territorialism. It is proposed that this instinct accounts for hostile behaviors ranging from minor street crime to world wars. Hormonal factors also appear to play a significant role in fostering aggressive tendencies. For example, the hormone testosterone has been shown to increase aggressive behaviors when injected into animals. Men and women convicted of violent crimes also possess significantly higher levels of testosterone than men and women convicted of nonviolent crimes. Numerous studies comparing different age groups, racial/ethnic groups, and cultures also indicate that men, overall, are more likely to engage in a variety of aggressive behaviors (e.g., sexual assault, aggravated assault, etc.) than women. One explanation for higher levels of aggression in men is based on the assumption that, on average, men have higher levels of testosterone than women.

15. All of the following statements can be seen as logically implied by the arguments of the passage EXCEPT:

1. if the alleged aggressive act is not sought to be avoided, it cannot really be considered aggression.

2. Freud's theory of aggression proposes that aggression results from the suppression of aggressive urges.

3. the Freudian theory of suicide as self-inflicted aggression implies that an aggressive act need not be sought to be avoided in order for it to be considered aggression.

4. a common theory of aggression is that it is the result of an abnormally low neural regulation of testosterone.

16. The author identifies three essential factors according to which theories of aggression are most commonly categorized. Which of the following options is closest to the factors identified by the author?

1. Hostile – Instrumental – Hormonal.

2. Extreme – Moderate – Mild.

3. Psychologically – Sociologically – Medically.

4. Aggressor – Circumstances of aggression – Victim

17. The author discusses all of the following arguments in the passage EXCEPT that:

1. the nature of aggression can vary depending on several factors, including intent.

2. several studies indicate that aggression may have roots in the biological condition of humanity.

3. men in general are believed to be more hormonally driven to exhibit violence than women.

4. aggression in most societies is kept under control through moderating the death instinct identified by Freud.

18. "[A]n enemy combatant may be subjected to torture in order to extract useful intelligence, though those inflicting the torture may have no real feelings of anger or animosity toward their subject." Which one of the following best explicates the larger point being made by the author here?

1. In certain kinds of aggression, inflicting pain is not the objective, and is no more than a utilitarian means to achieve another end.

2. The use of torture to extract information is most effective when the torturer is not emotionally involved in the torture.

3. Information revealed by subjecting an enemy combatant to torture is not always reliable because of the animosity involved.

4. When an enemy combatant refuses to reveal information, the use of torture can sometimes involve real feelings of hostility.

19. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1. But the attention of the layman, not surprisingly, has been captured by the atom bomb, although there is at least a chance that it may never be used again.

2. Of all the changes introduced by man into the household of nature, [controlled] large-scale

nuclear fission is undoubtedly the most dangerous and most profound.

3. The danger to humanity created by the so-called peaceful uses of atomic energy may, however, be much greater.

4. The resultant ionizing radiation has become the most serious agent of pollution of the environment and the greatest threat to man's survival on earth.

20. Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

1. The victim's trauma after assault rarely gets the attention that we lavish on the moment of damage that divided the survivor from a less encumbered past.

2. One thing we often do with narratives of sexual assault is sort their respective parties into different temporalities: it seems we are interested in perpetrators' futures and victims' pasts.

3. One result is that we don't have much of a vocabulary for what happens in a victim's life after the painful past has been excavated, even when our shared language gestures toward the future, as the term "survivor" does.

4. Even the most charitable questions asked about the victims seem to focus on the past, in pursuit of understanding or of corroboration of painful details.

5. As more and more stories of sexual assault have been made public in the last two years, the genre of their telling has exploded --- crimes have a tendency to become not just stories but genres.

21. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1. It also has four movable auxiliary telescopes 1.8 m in diameter.

2. Completed in 2006, the Very Large Telescope (VLT) has four reflecting telescopes,8.2 m in

diameter that can observe objects 4 billion times weaker than can normally be seen with the naked eye.

3. This configuration enables one to distinguish an astronaut on the Moon.

4. When these are combined with the large telescopes, they produce what is called interferometry: a simulation of the power of a mirror 16 m in diameter and the resolution of a telescope of 200 m.

22. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1. While you might think that you see or are aware of all the changes that happen in your immediate environment, there is simply too much information for your brain to fully process everything.

2. Psychologists use the term 'change blindness' to describe this tendency of people to be blind to

changes though they are in the immediate environment.

3. It cannot be aware of every single thing that happens in the world around you.

4. Sometimes big shifts happen in front of your eyes and you are not at all aware of these changes.

23. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

All humans make decisions based on one or a combination of two factors. This is either intuition or information. Decisions made through intuition are usually fast, people don't even think about the problem. It is quite philosophical, meaning that someone who made a decision based on intuition will have difficulty explaining the reasoning behind it. The decision-maker would often utilize her senses in drawing conclusions, which again is based on some experience in the field of study. On the other side of the spectrum, we have decisions made based on information. These decisions are rational — it is based on facts and figures, which

unfortunately also means that it can be quite slow. The decision-maker would frequently use reports, analyses, and indicators to form her conclusion. This methodology results in accurate, quantifiable decisions, meaning that a person can clearly explain the rationale behind it.

1. While decisions based on intuition can be made fast, the reasons that led to these cannot be spelt out.

2. It is better to make decisions based on information because it is more accurate, and the rationale behind it can be explained.

3. Decisions based on intuition and information result in differential speed and ability to provide a rationale.

4. We make decisions based on intuition or information on the basis of the time available.

24. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

With the Treaty of Westphalia, the papacy had been confined to ecclesiastical functions, and the doctrine of sovereign equality reigned. What

political theory could then explain the origin and justify the functions of secular political order? In his Leviathan, published in 1651, three years after the Peace of Westphalia, Thomas Hobbes provided such a theory. He imagined a “state of nature” in the past when the absence of authority produced a “war of all against all.” To escape such intolerable insecurity, he theorized, people delivered their rights to a sovereign power in return forthe sovereign’s provision of security for all within the state’s border. The sovereign state’s monopoly on power was established as the only way to overcome the perpetual fear of violent death and war.

1. Thomas Hobbes theorized that sovereign states emerged out of people’s voluntary desire to overcome the sense of insecurity and establish the doctrine of sovereign equality.

2. Thomas Hobbes theorized the emergence of sovereign states as a form of transactional governance to limit the power of the papacy.

3. Thomas Hobbes theorized the voluntary surrender of rights by people as essential for emergence of sovereign states.

4. Thomas Hobbes theorized the emergence of sovereign states based on a transactional relationship between people and sovereign state that was necessitated by a sense of insecurity of the people.

25. Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

1. You can observe the truth of this in every e-business model ever constructed: monopolise and protect data.

2. Economists and technologists believe that a new kind of capitalism is being created - different from industrial capitalism as was merchant capitalism.

3. In 1962, Kenneth Arrow, the guru of mainstream economics, said that in a free market economy the purpose of inventing things is to create intellectual property rights.

4. There is, alongside the world of monopolized information and surveillance, a different dynamic

growing up: information as a social good, incapable of being owned or exploited or priced.

5. Yet information is abundant. Information goods are freely replicable. Once a thing is made, it can be copied and pasted infinitely.

26. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

The rural-urban continuum and the heterogeneity of urban settings pose an obvious challenge to identifying urban areas and measuring urbanization rates in a consistent way within and across countries. An objective methodology for distinguishing between urban and rural areas that is based on one or two metrics with fixed thresholds may not adequately capture the wide diversity of places. A richer combination of criteria would better describe the multifaceted nature of a city's function and its environment, but the joint interpretation of these criteria may require an element of human judgment.

1. The difficulty of accurately identifying urban areas means that we need to create a rich combination of criteria that can be applied to all urban areas.

2. With the diversity of urban landscapes, measurable criteria for defining urban areas may need to be supplemented with human judgement.

3. Current methodologies used to define urban and rural areas are no longer relevant to our being able to study trends in urbanisation.

4. Distinguishing between urban and rural areas might call for some judgement on the objective methodology being used to define a city's functions.

Section - II: DI & LR

DIRECTION ***for questions 27 to 30****: Study the following table given below and answer the question that follows.*

Twenty five coloured beads are to be arranged in a grid comprising of five rows and five columns. Each cell in the grid must contain exactly one bead. Each bead is coloured either Red, Blue or Green.

While arranging the beads along any of the five rows or along any of the five columns, the rules given below are to be followed:

1. Two adjacent beads along the same row or column are always of different colours.
2. There is at least one Green bead between any two Blue beads along the same row or column.
3. There is at least one Blue and at least one Green bead between any two Red beads along the same row or column.

Every unique, complete arrangement of twenty five beads is called a configuration.

27. The total number of possible configurations using beads of only two colors is:

28. What is the maximum possible number of Red beads that can appear in any configuration?

29. What is the minimum number of Blue beads in any configuration?

30. Two Red beads have been placed in 'second row, third column' and 'third row, second column'. How many more Red beads can be placed so as to maximise the number of Red beads used in the configuration?

DIRECTION *for questions 31 to 36:* *Read the information given below and answer the question that follows.*

The Humanities department of a college is planning to organize eight seminars, one for each of the eight doctoral students - A, B, C, D, E, F, G and H. Four of them are from Economics, three from Sociology and one from Anthropology department. Each student is guided by one

among P, Q, R, S and T. Two students are guided by each of P, R and T, while one student is guided by each of Q and S. Each student is guided by a guide belonging to their department.

Each seminar is to be scheduled in one of four consecutive 30-minute slots starting at 9:00am, 9:30 am, 10:00 am and 10:30 am on the same day. More than one seminars can be scheduled in a slot, provided the guide is free. Only three rooms are available and hence at the most three seminars can be Scheduled in a slot. Students who are guided by the same guide must be scheduled in consecutive slots.

The following additional facts are also known.

1. Seminars by students from Economics are scheduled in each of the four slots.
2. A's is the only seminar that is scheduled at 10:00 am. A is guided by R.
3. F is an Anthropology student whose seminar is scheduled at 10:30 am.
4. The seminar of a Sociology student is scheduled at 9:00 am.

5. B and G are both Sociology students, whose seminars are scheduled in the same slot. The seminar of an Economics student, who is guided by T, is also scheduled in the same slot.
6. P, who is guiding both B and C, has students scheduled in the first two slots.
7. A and G are scheduled in two consecutive slots.

31. Which one of the following statements is true?

1. Three seminars are scheduled in the first slot.
2. Two seminars are scheduled in the first slot.
3. Only one seminar is scheduled in the second slot.
4. Three seminars are scheduled in the last slot.

32. Who all are NOT guiding any Economics students?

1. P, Q and S
2. P, R and S
3. Q, R and S
4. P, Q and R

33. Which of the following statements is necessarily true?

1. B is scheduled in the first slot.
2. H is an Economics student.
3. Q is guiding G.
4. S is guiding F.

34. If D is scheduled in a slot later than Q's, then which of the following two statement(s) is (are) true?

(i) E and H are guided by T.

(ii) G is guided by Q.

1. Only (i)
2. Both (i) and (ii)
3. Only (ii)
4. Neither (i) nor (ii)

35. If E and Q are both scheduled in the same slot, then which of the following statements BEST describes the relationship between D, H, and T?

1. At least one of D and H is guided by T.
2. Neither D nor H is guided by T.
3. Both D and H are guided by T.
4. Exactly one of D and H is guided by T.

36. If D is scheduled in the slot immediately before Q's, then which of the following is NOT necessarily true?

1. D is guided by T.
2. G is guided by Q.
3. F is guided by S.
4. E is guided by R.

DIRECTIONS ***for question 37 to 42:*** *Read the information given below and answer the question that follows.*

In an election several candidates contested for a constituency. In any constituency, the winning candidate was the one who polled the highest number of votes, the first runner up was the one who polled the second highest number of votes, the second runner up was the one who polled the third highest number of votes, and so on. There were no ties (in terms of number of votes polled by the candidates) in any of the constituencies in this election.

In an electoral system, a security deposit is the sum of money that a candidate is required to pay to the election commission before he or she is permitted to contest. Only the defeated candidates (i.e., one who is not the winning candidate) who fail to secure more than one sixth of the valid votes polled in the constituency, lose their security deposits.

The following table provides some incomplete information about votes polled in four constituencies: A,B, C and D, in this election.

	Constituency			
	A	B	C	D
No. of candidates contesting	10	12	5	8
Total No. of valid votes polled	5,00,000	3,25,000	6,00,030	
No. of votes polled by the winning candidate	2,75,000	48,750		
No. of votes polled by the first runner up	95,000			37,500
No. of votes polled by the second runner up				30,000
% of valid votes polled by the third runner up				10%

The following additional facts are known:

1. The first runner up polled 10,000 more votes than the second runner up in constituency A.

2. None of the candidates who contested in constituency C lost their security deposit. The difference in votes polled by any pair of candidates in this constituency was at least 10,000.

3. The winning candidate in constituency D polled 5% of valid votes more than that of the first runner up. All the candidates who lost their security deposits while contesting for this constituency, put together, polled 35% of the valid votes.

37. What is the percentage of votes polled in total by all the candidates who lost their security deposits while contesting for constituency A?

38. How many candidates who contested in constituency B lost their security deposit?

39. What BEST can be concluded about the number of votes polled by the winning candidate in constituency C?

1. less than 2,00,010
2. 1,40,010
3. between 1,40,005 and 1,40,010
4. 1,40,006

40. What was the number of valid votes polled in constituency D?

1. 1,75,000 2. 1,50,000 3. 62,500 4. 1,25,000

41. The winning margin of a constituency is defined as the difference of votes polled by the winner and that of the first runner up. Which of the following CANNOT be the list of constituencies, in increasing order of winning margin?

1. B, C, D, A 2. D, B, C, A

3. B, D, C, A 4. D, C, B, A

42. For all the four constituencies taken together, what was the approximate number of votes polled by all the candidates who lost their security deposit expressed as a percentage of the total valid votes from these four constituencies?

1. 23.91% 2. 23.54% 3. 32.00% 4. 38.25%

DIRECTIONS *for question 43 to 46:* *Read the information given below and answer the question that follows.*

A chain of departmental stores has outlets in Delhi, Mumbai, Bengaluru and Kolkata. The sales are categorized by its three departments – 'Apparel', 'Electronics', and 'HomeDecor'. An Accountant has been

asked to prepare a summary of the 2018 and 2019 sales amounts for an internal report. He has collated partial information and prepared the following table.

Sales Amounts (Crore Rupees)								
	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
Apparels	-	-	-	-	-	-	-	54
Electronics	78	98	82	102	90	70	80	100
Home Decor	-	100	-	72	-	80	-	54

The following additional information is known.

1. The sales amounts in the Apparel departments were the same for Delhi and Kolkata in2018.
2. The sales amounts in the Apparel departments were the same for Mumbai and Bengaluru in 2018. This sales amount matched the sales amount in the Apparel department for Delhi in2019.
3. The sales amounts in the Home Decor departments were the same for Mumbai and Kolkata in 2018.

4. The sum of the sales amounts of four Electronics departments increased by the same amount as the sum of the sales amounts of four Apparel departments from 2018 to 2019.
5. The total sales amounts of the four Home Decor departments increased by Rs 70 Crores from 2018 to 2019.
6. The sales amounts in the Home Decor departments of Delhi and Bengaluru each increased by Rs 20 Crores from 2018 to 2019.
7. The sales amounts in the Apparel departments of Delhi and Bengaluru each increased by the same amount in 2019 from 2018. The sales amounts in the Apparel departments of Mumbai and Kolkata also each increased by the same amount in 2019 from 2018.
8. The sales amounts in the Apparel departments of Delhi, Kolkata and Bengaluru in 2019 followed an Arithmetic Progression.

43. In HomeDecor departments of which cities were the sales amounts the highest in 2018and 2019, respectively?

1. Mumbai and Mumbai
2. Delhi and Delhi
3. Bengaluru and Delhi
4. Mumbai and Delhi

44. What was the increase in sales amount, in Crore Rupees, in the Apparel department of Mumbai from 2018 to 2019?

1. 10 2. 5 3. 8 4. 12

45. Among all the 12 departments (i.e., the 3 departments in each of the 4 cities), what was the maximum percentage increase in sales amount from 2018 to 2019?

1. 75 2. 50 3. 28 4. 25

46. What was the total sales amount, in Crore Rupees, in 2019 for the chain of departmental stores?

1. 600 2. 150
3. 750 4. 900

DIRECTIONS ***for question 47 to 50:*** *Read the information given below and answer the question that follows.*

A shopping mall has a large basement parking lot with parking slots painted in it along a single row. These slots are quite narrow; a compact car can fit in a single slot but an SUV requires two slots. When a car arrives, the parking attendant guides the car to the first available slot from the beginning of the row into which the car can fit.

For our purpose, cars are numbered according to the order in which they arrive at the lot. For example, the first car to arrive is given a number 1, the second a number 2, and so on. This numbering does not indicate whether a car is a compact or an SUV. The configuration of a parking lot is a sequence of the car numbers in each slot. Each single vacant slot is represented by letter V.

For instance, suppose cars numbered 1 through 5 arrive and park, where cars 1, 3 and 5 are compact cars and 2 and 4 are SUVs. At this point, the parking lot would be described by the sequence 1, 2, 3, 4, 5. If cars 2 and 5 now vacate their slots, the parking lot would now be described as 1, V, V, 3, 4. If a compact car (numbered 6) arrives subsequently followed by an SUV (numbered 7), the parking lot would be described by the sequence 1, 6, V, 3, 4, 7.

Answer the following questions INDEPENDENTLY of each other.

47. Initially cars numbered 1, 2, 3, and 4 arrive among which 1 and 4 are SUVs while 2 and3 are compact cars. Car 1 then leaves, followed by the arrivals of car 5 (a compact car) and car 6 (an SUV). Car 4 then leaves. Then car 7 (an SUV) and car 8 (a compact car)arrive. At this moment, which among the following numbered car is parked next to car3?

1. 8 2. 5 3. 7 4. 6

48. Suppose eight cars have arrived, of which two have left. Also suppose that car 4 is a compact and car 7 is an SUV. Which of the following is a POSSIBLE current configuration of the parking lot?

1. 8, 2, 3, V, 5, 6, 7 2. 8, 2, 3, V, 6, 5, 7

3. V, 2, 3, 7, 5, 6, 8 4. 8, 2, 3, V, 5, 7, 6

49. Suppose the sequence at some point of time is 4, 5, 6, V, 3. Which of the following is NOT necessarily true?

1. Car 3 is an SUV. 2. Car 5 is a compact.

3. Car 4 is a compact. 4. Car 1 is an SUV.

50. Suppose that car 4 is not the first car to leave and that the sequence at a time between the arrival of the car 7 and car 8 is V, 7, 3, 6, 5. Then which of the following statements MUST be false?

1. Car 4 is an SUV.
2. Car 2 is a compact.
3. Car 6 is a compact.
4. Car 7 is a compact.

Section - III: Quantitative Ability

51. A sum of money is split among Amal, Sunil and Mita so that the ratio of the shares of Amal and Sunil is 3:2, while the ratio of the shares of Sunil and Mita is 4:5. If the difference between the largest and the smallest of these three shares is Rs 400, then Sunil's share, in rupees, is

52. The number of pairs of integers (x, y) satisfy $x \geq y \geq -20$ and $2x + 5y = 99$ is

53. The number of integers that satisfy the equality $(x^2 - 5x + 7)^{x+1} = 1$ is

1. 4
2. 2
3. 3
4. 5

54. For the same principal amount, the compound interest for two years at 5% per annum exceeds the simple interest for three years at 3% per annum by Rs. 1125.Then the principal amount in rupees is

55. Aron bought some pencils and sharpeners. Spending the same amount of money as Aron, Aditya bought twice as many pencils and 10 less sharpeners. If the cost of one sharpener is Rs. 2 more than the cost of a pencil, then the minimum possible number of pencils bought by Aron and Aditya together is

1. 36
2. 33
3. 30
4. 27

56. In May, John bought the same amount of rice and the same amount of wheat as he had bought in April, but spent Rs. 150 more due to price increase of rice and wheat by 20%and 12%, respectively. If John had spent Rs. 450 on rice in April, then how much did he spend on wheat in May?

1. Rs. 560
2. Rs. 570
3. Rs. 580
4. Rs. 590

57. How many 4-digit numbers, each greater than 1000 and each having all four digits distinct, are there with 7 coming before 3?

58. If x and y are positive real numbers satisfying x + y = 102, then the minimum possible value of $2601\left(1+\frac{1}{x}\right)\left(1+\frac{1}{y}\right)$ is

59. In how many ways can a pair of integers (x, a) be chosen such that $x^2 - 2|x| + |a - 2| = 0$?

1. 5 2. 4 3. 7 4. 6

60. Two circular tracks T1 and T2 of radii 100 m and 20 m, respectively touch at a point A. Starting from A at the same time, Ram and Rahim are walking on track T1 and track T2at speeds 15 km/hr and 5 km/hr respectively. The number of full rounds that Ram will make before he meets Rahim again for the first time is

1. 2 2. 5 3. 3 4. 4

61. Let $f(x) = x^2 + ax + b$ and $g(x) = f(x + 1) - f(x-1)$. If $f(x) \geq 0$ for all real x, and $g(20) = 72$, then the smallest possible value of b is

1. 4 2. 1 3. 16 4. 0

62. Let C1and C2 be concentric circles such that the diameter of C1 is 2cm longer than that of C2. If a chord of C1 has length 6cm and is a tangent of C2, then the diameter, in cm, of C1 is

63. The sum of the perimeters of an equlateral triangle and a rectangle is 90 cm the area, T, of the triangle and the area, R, of the rectangle, both in sq cm, satisfy the relationship $R = T^2$. If the sides of the rectangle are in the ratio 1:3, then the length, in cm, of the longer side of the rectangle, is

1. 21 2. 18 3. 24 4. 27

64. The distance from B to C is thrice that from A to B. Two trains travel from A to C via B. The speed of train 2 is double that of train 1 while traveling from A to B and their speeds are interchanged while traveling from B to C. The ratio of the time taken by train 1 to that taken by train 2 in travelling from A to C is

1. 7:5 2. 1:4 3. 5:7 4. 4:1

65. In a group of 10 students, the mean of the lowest 9 scores is 42 while the mean of the highest 9 scores is 47. For the entire group of 10 students, the maximum possible mean exceeds the minimum possible mean by

1. 3 2. 5 3. 4 4. 6

66. Let the m-th and n-th terms of a geometric progression be 3/4 and 12, respectively, where m < n. If the common ratio of the progression is an integer r, then the smallest possible value of r + n - m is

1. -2 2. 6 3. 2 4. -4

67. A and B are two points on a straight line. Ram runs from A to B while Rahim runs from B to A. After crossing each other, Ram and Rahim reach their destinations in one minute and four minutes, respectively. If they start at the same time, then the ratio of Ram's speed to Rahim's speed is

1. $2\sqrt{2}$ 2. 2 3. $\frac{1}{2}$ 4. $\sqrt{2}$

68. In a car race, car A beats car B by 45 km, car B beats car C by 50km, and car A beats C by 90 km. the distance (in km) over which the race has been conducted is

1. 550 2. 500 3. 475 4. 450

69. From an interior point of an equilateral triangle, perpendiculars are drawn on all three sides. The sum of the lengths of the three perpendiculars is s. Then the area of triangle is

1. $\frac{2s^2}{\sqrt{3}}$ 2. $\frac{s^2}{2\sqrt{3}}$ 3. $\frac{\sqrt{3}s^2}{2}$ 4. $\frac{s^2}{\sqrt{3}}$

70. Students in a college have to choose at least two subjects from chemistry, mathematics and physics. The number of students choosing all three subjects is 18,choosing mathematics as one of their subjects is 23 and choosing physics as one of their subjects is 25. The smallest possible number of students who could choose chemistry as one of their subjects is

1. 19 2. 22 3. 20 4. 21

71. Anil buys 12 toys and labels each with the same selling price. He sells 8 toys initially at 20% discount on the labeled price. Then he sells the remaining 4 toys at an additional 25% discount on the discounted price. Thus, he gets a total of Rs 2112, and makes a 10% profit. With no discounts, his percentage of profit would have been

1. 60 2. 54 3. 55 4. 50

72. For real x, the maximum possible value of $\frac{x}{\sqrt{1+x^4}}$ is

1. $\frac{1}{\sqrt{2}}$ 2. $\frac{1}{2}$ 3. $\frac{1}{\sqrt{3}}$ 4. 1

73. John takes twice as much time as Jack to finish a job. Jack and Jim together take one-thirds of the time to finish the job than John takes working alone. Moreover, in order to finish the job, John takes three days more than that taken by three of them working together. In how many days will Jim finish the job working alone?

74. The value of $\log_a\left(\frac{a}{b}\right) + \log_b\left(\frac{b}{a}\right)$, for $1 < a \leq b$ cannot be equal to

1.-0.5 2.1 3. 0 4. -1

75. If x and y are non-negative integers such that x + 9 = z, y + 1 = z and x + y < z + 5,then the maximum possible value of

76. Let C be a circle of radius 5 meters having center at O. Let PQ be a chord of C that passes through points A and B where A is located 4 meters north of O and B is located3 meters east of O. Then, the length of PQ, in meters, is nearest to

1. 8.8 2. 7.2 3. 7.8 4. 6.6

Answer Key & Explanation

Q. No.	Key	Explanations
1.	1	Options B, C and D find support in paragraph 4, 3 and 1 respectively. Only option A does not find mention in the passage.
2.	2	Indignant means showing anger or annoyance Analytical means logical Facetious meaning sarcasm. The author's views in the given sentence do not support any of the above. Rather he is giving reasons to why the people indulge I piracy, so IRONIC is appropriate.
3.	4	Option A is rejected because he has just mentioned them as examples and not those who laid foundation of piracy. Option B is rejected as it is opposite to what is mentioned in 2nd paragraph. Option C is eliminated as the paragraph talks about disorganised people and not piracy. Only option D brings in the meaning of the sentence(i.e. acquisition of wealth)
4.	3	Everything else is rejected by the author (refer penultimate paragraph) and only option C could help to bring piracy under control in the long run

5.	1	Refer to the line "for some climate activists------ access to energy". So option A is correct.
6.	4	Negative impacts of renewable energy need to be studied to ensure no social or environmental harm. Hence option D is the answer.
7.	4	The author's reservation is about different consequences of renewable energy systems on environment, profitability etc. hence option D is the answer.
8.	2	According to the last paragraph, there are pros as well as con to look after before going ahead with the development of renewable energy, hence option B is correct.
9.	3	Throughout the passage, the author is majorly concerned about developing renewable systems o energy to reduce carbon footprint and the disposal of toxic waste globally, hence option C is correct.
10.	3	Options A, B and D are illogical, only C can be interpreted.
11.	4	Options A, B and C find support in paragraph 1, 4 and last respectively. Only option D cannot be inferred because not only institutional structure, but a number of other factors need to be considered that help to study visual culture.
12.	2	Only option B conveys the correct interpretation of the given sentence. The idea is

		sight or vision becomes the meaningful visual experience. Rest of the options distort the main idea by putting focus on images , meaningful convenants or images of convenants being the base of visual experience which is wrong.
13.	1	If we scan the passage from paragraph, 2 till the end, we can find the proper order of the words. First is IMAGERY, second is VISUAL PRACTICES, third is LIFEWORLDS, fourth is STRUCTURES OF PERCEPTION. Hence option A.
14.	4	**EPIPHENOMENA** means a secondary effect or by-product of some event or condition, so option D is bringing the correct meaning.
15.	4	2^{nd} line of para 1 supports option A 6^{th} line of para 2 supports option B 5^{th} line of para 2 supports option C Whatever is mentioned as option D is opposite to the contents of the passage, hence the answer.
16.	4	The answer is clearly mentioned in the last lines of 1^{st} para. Hence option D.
17.	4	Options A, B and C find mention in 2^{nd} paragraph. But option D states opposite to the 4^{th} line of 2^{nd} para, hence the answer.
18.	1	The example is used by the author to explain a different type of aggression and not the type of

		torture inflicted on the enemy with the motive to extract any information as depicted in options B, C and D. The best explanation is given in option A.
19.	2413	Sentence B opens the paragraph as it introduces the topic. Sentence D gives further explanation to B and its contrast is given in A. The paragraph concludes with C. So the sequence is BDAC
20.	4	The sentences EBCA seem to form a sequence. The questions that arose in D seem to B from the same article but a link is missing to put D in the above sequence because we can't identify how the 'charitable questions' came up. Hence D is the misfit
21.	2143	Sentence B introduces the topic VLT. The pronoun 'it' in A pairs with B (noun-pronoun pair) D describes further the functioning of VLT (key word 'these') Finally C closes the paragraph. So the sequence is BADC
22.	1342	Sentence A opens the paragraph by introducing the topic (your brain is aware of all changes going around) Sentence C comes next in sequence (keyword "it" referring to brain)

		Sentence D further explains C Sentence B concludes the paragraph. The final sequence is ACDB
23.	3	We can conveniently eliminate options A and B as they focus on single aspect of the paragraph. Option D, though specifies both aspects , is eliminated because it is not the matter of time that is considered to differentiate between both types of decision- making. Only option C accurately captures the essence of the paragraph.
24.	4	Options A and C are rejected because of the usage of *'voluntary desires' or 'voluntary surrender of rights' of people,* rather it was a transactional relationship between people and sovereign state an the same is aptly presented in option D. Option B is opposite to the contents of the paragraph, hence eliminated.
25.	2	The correct sequence is CAED Whereas in B, altogether a different aspect(merchant capitalism) is taken which finds reference in none of the other sentences. Although the other sentence talk about the beginning of the end of capitalism and also discuss new ways of working and sharing economy, but merchant capitalism is misfit

		here. Hence B is the correct option as misfit.
26.	2	Option C is eliminated because the paragraph does not mention that current methodologies are irrelevant. Option D is rejected as combination of criteria is also important for interpretation of city's functions. Option A seems close but missed the aspect of human judgement, hence rejected. Option B captures the summarized essence of the paragraph.
27.	2	If we have to use 2 colors, then those two colors have to be Blue and Green only, because if red color is used, then there has to be at least one green and one blue between any two beads. There are two possible configurations if exactly 2 colors are used. Diagrams are shown below:: A BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE

		B GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN BLUE GREEN
28.	9	Maximum number of red beads can appear only when we minimize Blue and Green colored beads. The arrangement is as given below: RED GREEN BLUE RED GREEN GREEN RED GREEN BLUE RED BLUE GREEN RED GREEN BLUE RED BLUE GREEN RED GREEN GREEN RED BLUE GREEN RED So we can see that there are 9 Red colored beads in the above arrangement.
29.	6	Minimum number of blue beads can appear only when we maximize Red and Green colored beads. The arrangement is as given below: RED GREEN BLUE RED GREEN GREEN RED GREEN BLUE RED BLUE GREEN RED GREEN BLUE RED BLUE GREEN RED GREEN

		GREEN RED BLUE GREEN RED So we can see that there are 6 Blue colored beads in the above arrangement.
30.	6	We will make the arrangement as given in the question: RED RED RED RED RED RED RED RED Now we can see that there will be maximum 6 red colored beads which satisfy the given arrangement.
31-36.		From 1, Economics is at scheduled at each slot From 2, Only A is scheduled at 10 so it has to be Economics and guided by R From 5, 6 and 7 B,G and C are having seminar on Sociology. B and C are guided by P and having seminar in first two slots so C will be at 9, B and G will be at 9:30 and 1 student from economics guided by T will be also be at 9:30. R cannot be at 9 because Students who are guided by the same guide must be scheduled in consecutive slots. From 3, F is at 10:30, so at 9:30, 3 students are there and at 9 am, C and 1 more student having economics would be there, at 10 am only 1 student would be there. At 10:30 2 students one having economics and other

having anthropology would be there.
From the information given we can draw following table

Name	Subject	Time	Guide
A	Economics	10 am	R
B	Sociology	9:30 am	P
C	Sociology	9 am	P
D	Economics		R/T
E	Economics		R/T
F	Anthropology	10:30 am	S/Q
G	Sociology	9:30 am	S/Q
H	Economics		R/T

31.	2	From the above information only two would be in 1st slot
32.	1	Economics are guided by R and T. So ans. is Option 1
33.	2	From the above information H is an Economics student.
34.	2	If D is scheduled later than Q then, Q will be at 9:30 and He will guide G and S will guide F. R will guide D at 10:30. E and H will be guided by T. So ans is option 2
35.	1	If E and Q are in same slot then it will be 9:30 or at 10:30 If E will be guided by R then D and H will be guided by T, and if E will be guided by T then one of D and H will be guided by T So At least one of D and H is guided by T

<table>
<tr><td></td><td></td><td>So ans. will be 1st option</td></tr>
<tr><td>36.</td><td>4</td><td>If D is immediately before Q then Q is at 9:30 and D is at 9 that means F if guided by S at 10:30, G is guided by Q, D and E can be guided by R/T
So ans is option 4</td></tr>
<tr><td>37-41.</td><td colspan="2"><table>
<tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Number of candidates</td><td>10</td><td>12</td><td>5</td><td>8</td></tr>
<tr><td>Total valid votes</td><td>500000</td><td>325000</td><td>600030</td><td></td></tr>
<tr><td>Winning candidate</td><td>275000</td><td>48750</td><td></td><td></td></tr>
<tr><td>First runner up</td><td>95000</td><td></td><td></td><td>37500</td></tr>
<tr><td>Second runner up</td><td>(85000)</td><td></td><td></td><td>30000</td></tr>
<tr><td>% of votes by Third runner up</td><td></td><td></td><td></td><td>10%</td></tr>
</table></td></tr>
<tr><td>37.</td><td>9</td><td>Votes got by Second runner up from A= 95000-10000= 85000
Votes got by the candidates who lost their security deposits= 500000-275000-95000-85000= 45000
Required % = $\frac{45000}{500000}\times 100 = 9\%$</td></tr>
<tr><td>38.</td><td>11</td><td>In constituency B winner got $= \frac{48750}{325000}\times 100 = 15\%$
So all the candidates except the winner lose</td></tr>
</table>

		their security deposit because they got less than 1/6 of the total valid votes. So ans is 12-1= 11
39.	4	All candidates should got more than $1/6^{th}$ of the total valid votes which is $\frac{600030}{6} = 100005$ Suppose winner got = x votes, and if we assume that each candidate got 10000 less votes than previous candidate Then A.T.Q = x+ x-10000+ x-20000+ x- 30000 + x-40000= 600030 Then x= 140006 So ans is option 4
40.	1	Let the valid votes in constituency D= x 1^{st} runner up got = 37500 Winner got 37500+.05x 2^{nd} runner up got 30000 votes and the remaining candidates loose their security so A.T.Q 37500+ .05x+ 37500+30000= 0.65x So x= 175000 So ans is 1^{st} option
41.	1	Winning margin in constituency D = .05 x 175000= 8750 Winning margin of C is atleast 10000 that means margin of C is greater than D So option 1 is wrong.

42. 1

Total votes = 500000 + 325000 + 600030 + 175000= 1600030

In A (500000-275000-95000-85000) = 45000 votes were polled to the candidates who lost their security

In B, All candidates except the winner lost their security which is equal to 325000- 48750= 276250

In C, no one lost the security

In D, 35% of 175000= 61250 votes are polled to the candidates who lost their security

Total votes polled to the candidates who lost their security = 45000+276250+61250= 382500

Required % = $\frac{382500}{1600030} \times 100 = 23.91\%$

So answer is option 1

43-46. We have the following incomplete table which can be filled with different letters as per the condition given.

	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
Apparels	x	y	y	c	y	b	x	54

Electronics	78	98	82	102	90	70	80	100
Home decor		100	a	72		80	a	54

In last point it is given that y, 54 and b are A. P. ⇒ bb + y = 108 ----(1)

The total of electronics dept. In 2018 = 330cr

Total of electronics dept. in 2019 = 370cr

Incase are in sales in 2019 as compare to 2018 is 40 cr

As per the point 4, we have

(y + c + b + 54) - (x + y + y + x) = 40

⇒ b + c + 54 - y - 2x = 40

⇒ 2x + y - b - c = 14 ---(2)

From 7, we have y - x = b - y

⇒ b = 2y - x -----(3)

& c - y = 54 - x

⇒ c = 54 + y - x ---(4)

Using (3) & (4) in (2) we get 2x + y - 2y + x - 54 - y + x = 14

⇒ 4x - 2y = 68

⇒ 2x - y = 34 ---(5)

Using (3) in (1), we get, 3y - x = 108 --(6)

Solve (5) & 6, to get y = 50, x = 42

∴ (3) ⇒ b = 58

(4) ⇒ c = 62

Total sale of Home décor increased by Rs 70 cr. Using point 6, we can say that sale of Home décor in Delhi in 2018 is Rs 80 cr & in Bengaluru in 2018 is Rs 60 Cr.

Now 72 - a + 54 - a = 30

⇒ 2a = 96 ⇒ a = 48

Hence the final table is as below

	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
Apparels	42	50	50	62	50	58	42	54
Electronics	78	98	82	102	90	70	80	100
Home decor	80	100	48	72	60	80	48	54

43.	2	In Home décor, Delhi has maximum sales in 2018 & 2019.
44.	4	In Mumbai, the sales of Apparel dept. Increased by Rs. 12 cr.
45.	2	The max % increase is 50% for Mumbai in Home décor dept.
46.	4	The total sales of all dept. In 2019 is Rs. 900 crore
47.	3	The initial cars are 1, 2, 3, 4, when can 1 leaves, we have the arrangement V V 2 3 4 Now car 5 (a compact car) and car 6 (an SUV) came. So arrangement is 5 V 2 3 4 6 Now care 4 left, we have the arrangement 5 V 2 3 V V 6 Now car 7 (an S U V) and car 8 (a compact car) arrived, so final arrangement is 5, 8, 2, 3, 7, 6. Hence car number 7 is parked next to car 3.
48.	1	As per the options, car 1 & car 4 left as Car 8 is the last car to arrive, so it should be either at 1st position or the last position. So option 3 is wrong. In option 2, the position of car 4 is vacant. If car 5 arrived after car 4 left, then it should have been next to car 3. If car 4 left after the car 5 arrived, then car 5 should be next to V. in any

		case, car 5 cannot be after car 6. Hence option 2 is wrong. In option 4, it is clear that car 4 left after car 5 arrived. So car next to car 5 should be car 6. Hence it is wrong. Only option 1 is true where car 4 left after car 5 arrived.
49.	1	Total cars arrived here are 6 and car 3 is placed in the end. It is possible it cars 1 & 2 are S UV, then we have the arrangement 1 2 3 Now cars 1 & 2 left, then the arrangement is V V V V 3 After that the cars 4, 5, 6 arrived in order so that the final arrangement is. 4 5 6 V 3 Hence cars 4 & 5 are compact & car 1 is an S U V. but we cannot say about car 3, whether it is an S U V or a compact car.
50.	3	The original order is 1 2 3 4 5. Now car 6 is at the place of car 4 and car 4 is not the first one to leave. So either car 1 & car 2 will leave first. If we assume that the first car left is car 1, them as car 2 is also leaving, so car 7 will take the first position. So first position cannot be empty. Hence car 2 is the one which left at the first place and after it car 4 left. So we have following possibilities. 1 V 3 V 5 or 1 V 3 V V 5

<table>
<tr><td></td><td></td><td>Car 2 is not an S U V because in that case, car 6 will be next to car 1.
Also car 6 is not compact otherwise, it will be again next to car 1. So car 6 is an S U V and we have the order 1 V 3 6 5
Now car 7 came which is compact and order is 1 7 3 6 5. After that the car 1 left to give the final order as V 7 3 6 5</td></tr>
<tr><td>51.</td><td>800</td><td>Given that Amal : Sunil = 3 : 2.
Also, Sunil : Mita = 4 : 5
On combining the ratio we get Amal : Sunil : Mita = 6 : 4 : 5
So, let their shares be 6x, 4x and 5x
According to the question 6x – 4x = 400
2x = 400
x = 200
So, Sunil’s share = 4x = 4 × 200 = 800</td></tr>
<tr><td>52.</td><td>17</td><td>2x + 5y = 99 also it is given that x ≥ y ≥ -20
So, possible cases are
<table>
<tr><th>x</th><th>y</th><th>x</th><th>y</th></tr>
<tr><td>47</td><td>1</td><td>52</td><td>-1</td></tr>
<tr><td>42</td><td>3</td><td>57</td><td>-3</td></tr>
<tr><td>37</td><td>5</td><td>62</td><td>-5</td></tr>
<tr><td>32</td><td>7</td><td>67</td><td>-7</td></tr>
<tr><td>27</td><td>9</td><td>72</td><td>-9</td></tr>
<tr><td>22</td><td>11</td><td>77</td><td>-11</td></tr>
<tr><td>17</td><td>13</td><td>82</td><td>-13</td></tr>
</table></td></tr>
</table>

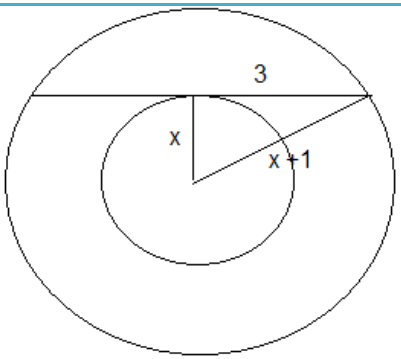
		87 -15 92 -17 97 -19 So, total 17 cases are there
53.	3	$(x^2 - 5x + 7)^{x+1} = 1$ For R.H.S to be 1, we must have $x^2 - 5x = -6$ $x^2 - 5x + 6 = 0$ On solving, we get x = 2, 3 (2 values) Also, we must have $a^0 = 1$ So, x + 1 = 0 i.e. x = -1 (1 value) also satisfies. Hence answer is 3.
54.	90000	Let the principal = 8000 So, simple interest for 3 years @ 3% per annum = Rs.720 Compound interest for 2 years @ 5% per annum = Rs.820 Difference = Rs.100 So, using unitary method When difference is 100 principal is 8000 When difference is 1125 principal is 90000
55.	2	Let the cost of pencil is Rs. x and of sharpener is Rs.(x+2) Let Aron bought 'a' pencils & 'b' sharpeners. Aditya bought '2a' pencils & 'b – 10' sharpeners. Now, ax + b(x + 2) = 2ax + (b – 10)(x + 2) ax + bx + 2b = 2ax + bx + 2b – 10x – 20

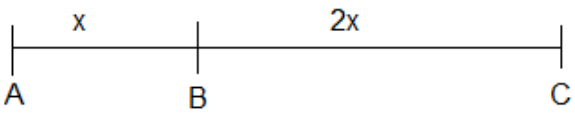
		ax – 10x = 20 a – 10 = 20/x a = 20/x + 10 Now 'a' is minimum when 'x' is maximum i.e. x = 20 Minimum 'a' = 20/20 + 10 = 11 Total pencils = 3a = 3 × 11 = 33
56.	1	Given that John had spent Rs.450 in April and it is being given that in May price of rice is increased by 20%. So, price of rice is increased by 90 (20% of 450). And it is given that in May he had Rs.150 more out of which 90 is for rice. So, for wheat he had spend Rs.60 more (150 – 90). 12% of original price in April = 60 100% of original price in April = 500. So, he spend on wheat in may = 500 + 12% of 500 = 560
57.	315	Case I: When 7 is at first place then 3 can be any of the three places = 1 × 1 × 8 × 7 + 1 × 8 × 1 × 7 + 1 × 8 × 7 × 1 = 168 Case II: When 3 is at the last place = 7 × 1 × 7 × 1 + 7 × 7 × 1 × 1 = 98 Case III: When both 7 and 3 are in middle places = 7 × 1 × 1 × 7 = 49 So, total cases = 168 + 98 + 49 = 315

58.	2704	Since we need to find the minimum value and as we know that minimum value will occur when we have symmetry. So, as x + y = 102. We have x = 51 and y = 51. So, the minimum possible value of 2601 (1 + 1/x) (1 + 1/y) = 2704
59.	3	$x^2 - 2\|x\| + \|a - 2\| = 0$ _____(1) Case I: x ≥ 0 & a ≥ 2 $x^2 - 2x + a - 2 = 0$ For D ≥ 0 ⇒ 4 − 4(a − 2) ≥ 0 ⇒1 − (a − 2) ≥ 0 ⇒ 1 − a + 2 ≥ 0 ⇒ a ≤ 3 Therefore a = 2, 3 If a = 2, eq"(1) becomes $x^2 - 2x = 0$ ⇒ x = 0, 2 Therefore, (0, 2), (2, 0) are possible pairs. If a = 3, eq"(1) becomes $x^2 - 2x + 1 = 0$ ⇒ x = 1 So (1, 3) is possible pair. Case II: x ≥ 0, a < 2 $x^2 - 2x - (a - 2) = 0$ For D ≥ 0 ⇒ 4 + 4(a − 2) ≥ 0 ⇒ 1 + a − 2 ≥ 0 ⇒ a − 1 ≥ 0 ⇒ a ≥ 1 ⇒ a = 1 When a = 1, eq"(1) becomes $x^2 - 2x + 1 = 0$ ⇒ x = 1 Therefore (1,1) is possible pair. Case III: If x < 0, a ≥ 2 $x^2 + 2x + a - 2 = 0$

		For D ≥ 0 ⇒ 4 − 4 (a − 2) ≥ 0 1 − a + 2 ≥ 0 ⇒ a ≤ 3 ⇒ a = 2, 3 If a = 2, eq"(1) becomes $x^2 + 2x = 0$ ⇒ x = 0, -2 Therefore (0, 2) and (-2, 2) is pair If a = 3, eq"(1) becomes $x^2 + 2x + 1 = 0$ ⇒ $(x + 1)^2 = 0$ ⇒ x = -1 Therefore (-1, 3) is possible pair. Case IV: If x < 0, a < 2 $x^2 + 2x − (a − 2) = 0$ For D ≥ 0 ⇒ 4 + 4 (a − 2) ≥ 0 1 + a − 2 ≥ 0 ⇒ a ≥ 1 Therefore, a = 1 Eq"(1) becomes $x^2 + 2x + 1 = 0$ ⇒ x = -1 Therefore (-1, 1) is possible pair. There are 7 such pairs of integers as follows (0, 2) (2, 2) (1, 3) (1, 1) (-2, 2) (-1, 3) (-1, 1)
60.	3	Ratio of time taken by Ram and Rahim is $= 2\pi \times 100 \times 18/15 \times 5 : 2\pi \times 20 \times \frac{18}{5} \times 5 = 5:3$ So, ratio of distance = 3:5 So, answer is 3.

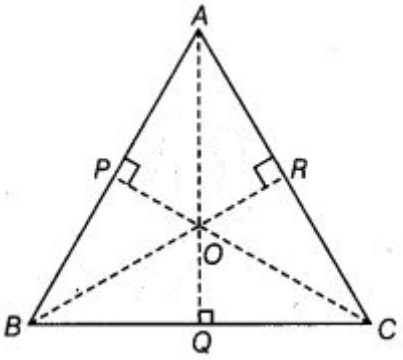
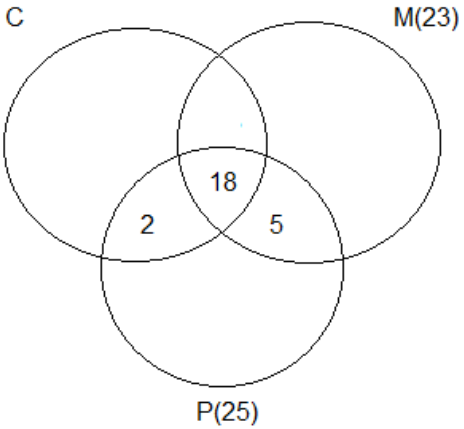
61.	1	$f(x) = x^2 + ax + b$ and $g(x) = f(x + 1) - f(x - 1)$ $g(x) = (x + 1)^2 + a(x + 1) + b - [(x - 1)^2 + a(x - 1) + b]$ $g(x) = x^2 + 2x + 1 + ax + a + b - [x^2 - 2x + 1 + ax - a + b]$ $g(x) = x^2 + 2x + 1 + ax + a + b - x^2 + 2x - 1 - ax + a - b$ $g(x) = 4x + 2a$ Now, $g(20) = 72 \Rightarrow 4(20) + 2a = 72$ $\Rightarrow 2a = -8$ $\Rightarrow a = -4$ $\therefore f(x) = x^2 - 4x + b$ As $f(x) \geq 0 \Rightarrow D \leq 0$ $16 - 4b \leq 0$ $\Rightarrow b \geq 4$ Therefore smallest value of b is 4.
62.	10	If the diameter of circle C_1 is 2 more than the diameter of circle C_2 so we can say that radius of C_1 is 1 more than the radius of circle C_2. As shown below in the figure,

		 Now, we can say that it must satisfy Pythagoras property So, x will be 4 and x + 1 will be 5 i.e. radius of circle C_1 is 5 cm. So, diameter of circle C_1 is 10 cm.
63.	4	Let the ratio be x. So, the dimensions of rectangle is x and 3x and let the side of equilateral triangle be 'a' Perimeter of rectangle = 2 (x + 3x) = 8x Perimeter of equilateral triangle = 3a According to the question: 3a + 8x = 90 _____ (1) Also, given that relation $R = T^2$, where R is area of rectangle and T is area of equilateral triangle So, we have $3x^2 = (\sqrt{3}/4\ a^2)^2$ $x = a^2/4$ Substituting x in eq"(1), we have $2a^2 + 3a - 90 = 0$

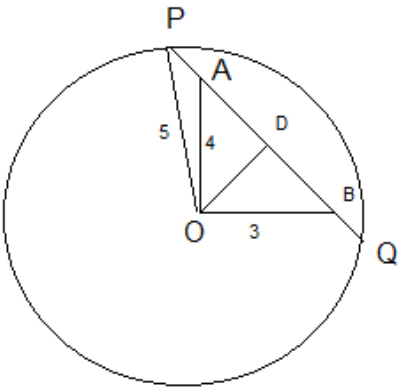
		On solving, we get a = 6 Hence, x = 9 So, longer side of rectangle = 3x = 3 × 9 = 27
64.	3	Let the distance between AB = x and BC = 3x  Let speed of train 1 be 'y' and speed of train 2 be '2y' As we know, Time = Distance/Speed For A to B: For Train 1 time = x/y and For Train 2 time = 3x/2y For B to C: For Train 1 time = x/2y and For Train 2 time = 3x/y So, total time = [x/y + 3x/2y]/[x/2y + 3x/y] = 5x/7x So, time taken by train1 to that taken by train 2 in travelling from A to C is 5:7
65.	3	Difference between highest number – Lowest number = 9 × 47 – 9 × 42 = 45 Maximum possible value of highest number = 42 + 45 = 87 Minimum possible value of lowest number = 47 – 45 = 2 So, Maximum possible mean = [42 × 9 + 87]/10

		= 46.5 Minimum possible mean = [47 × 9 + 2]/10 = 42.5 Required difference = 46.5 – 42.5 = 4
66.	1	Let 'a', 'r' be the first term and common ratio respectively. Given that m^{th} term = ¾ $a\ r^{m-1}$ = ¾ _____ (1) Also, n^{th} term = 12 $a\ r^{n-1}$ = 12 _____(2) Dividing (2) by (1), we have $a\ r^{n-1} / a\ r^{m-1}$ = 12/(3/4) r^{n-m} = 16 Now, for minimum value of r + n – m, we have r = - 4 and n – m = 2 Smallest possible value of r + n – m = - 4 + 2 = - 2
67.	2	As we know that if two objects P and Q start at the same time in opposite direction from point A and B respectively. After passing each other, P reaches B in x seconds and Q reaches A in y seconds then, Speed of P: Speed of Q = √b : √a So, Ram's speed : Rahim's speed = √4 : √1 = 2 : 1
68.	4	Let A travels = x B travels = x – 45 C travels = x – 90

		So, when B covers (x – 45) then C covers (x – 90) When B covers x = (x – 90)/(x – 45) × x = (x – 50) On solving, we get x = 450
69.	4	Let the side of equilateral triangle = 'a' As we know area of equilateral triangle ΔABC = √3/4 (Side)^2 = √3/4 (a)^2 _____ (1) Also, we have PO + OQ + OR = s (Given) Area of ΔOAB = ½ × AB × OP = ½ × a × OP Area of ΔOBC = ½ × BC × OQ = ½ × a × OQ Area of Δ OAC = ½ × AC × OR = ½ × a × OR Area of ΔABC = Area of ΔOAB + Area of ΔOBC + Area of Δ OAC = ½ × a × OP + ½ × a × OQ + ½ × a × OR = ½ × a × (OP + OQ + OR) = ½ × a × s _____ (2) Equating (1) and (2), we have √3/4 a^2 = ½ × a × s a = 2s/√3 Substituting, value of 'a' in equation (1), we have Area of equilateral ΔABC = s^2/√3

		
70.	3	 As the no. of students who have chemistry is minimum, so let 5 students have both Maths and Physics only. So, 2 students with physics will have chemistry also. Therefore, minimum students with chemistry = 18 + 2 = 20
71.	4	Let x be the total purchase price of all articles

		and y be the marked price of one article. So, according to the question: $8 \times 0.8 \times y + 4 \times 0.75 \times 0.8 \times y = 2112$ On solving, we get y = 240 Given, 2112 = 1.10x x = 1920 If no discount is given, then $12 \times 240 = 2880$ Required % = 2880 – 1920/1920 = 50%
72.	1	As we know the minimum value of $x + 1/x = 2$. So, the answer will be $1/\sqrt{2}$.
73.	4	Since John takes twice as much as Jack to finish a job. So, efficiency of John and jack is 1:2. Also, Jack and Jim together take one-third of the time to finish the job than John. So, efficiency of Jack + Jim and John is 3:1. So, efficiency of John, Jack and Jim is 1:2:1 respectively. Now, let all of them together took 'x' days so John alone take x + 3 days. So, $x (1 + 2 + 1) = x + 3$ On solving, we get x = 1 So, John takes = 4 days, Jack = 4/2 = 2 days and Jim = 4 days
74.	2	Let $A = \log_a (a/b) + \log_b (b/a)$ $A = \log_a a - \log_a b + \log_b b - \log_b a$ $A = 2 - [\log_a b + \log_b a]$ $A = 2 - [\log_a b + 1/\log_a b]$ Now, $[\log_a b + 1/\log_a b]$ has minimum value 2.

		Therefore, maximum value of A = 2 – 2 = 0 ⇒ A cannot take value as 1.
75.	23	x + 9 = z _____ (1) y + 1 = z _____ (2) Adding (1) and (2), we get x + y +10 = 2z ⇒ x + y = 2z – 10 Now, x + y < z + 5 2z – 10 < z + 5 z < 15 Therefore, Maximum z = 14 From eq"(1), Maximum x = z – 9 = 5 From eq"(2), Maximum y = z – 1 = 13 Max.(2x + y) = 2 × 5 + 13 = 23
76.	1	 Here OD perpendicular to PQ OA = 4, OB = 3 ⇒ AB = 5

		Now in ΔOAB 1/3 × 3 × 4 = ½ × OD × 5 OD = 12/5 = 2.4 Now, join OP, ΔODP is right angled triangle & OP = 5 PD = $\sqrt{(OP)^2 - (OD)^2} = \sqrt{25 - (2.4)^2} = \sqrt{19.24}$ = 4.4 PD = 4.4 PB = 4.4 × 2 = 8.8 m

Section - I: Verbal Ability

DIRECTION ***for questions 1 to 5:*** *The passage below is accompanied by a set of questions. Choose the best answer to each question.*

Passage - I

Mode of transportation affects the travel experience and thus can produce new types of travel writing and perhaps even new "identities." Modes of transportation determine the types and duration of social encounters; affect the organization and passage of space and time; . . . and also affect perception and knowledge—how and what the traveler comes to know and write about. The completion of the first U.S. transcontinental highway during the 1920s . . . for example, inaugurated a new genre of travel literature about the United States—the automotive or road narrative. Such narratives highlight the experiences of mostly male protagonists "discovering themselves" on their journeys, emphasizing the independence of road travel and the value of rural folk traditions.

Travel writing's relationship to empire building— as a type of "colonialist discourse"—has drawn the most attention from academicians. Close connections have been observed between European (and American)

political, economic, and administrative goals for the colonies and their manifestations in the cultural practice of writing travel books. Travel writers' descriptions of foreign places have been analyzed as attempts to validate, promote, or challenge the ideologies and practices of colonial or imperial domination and expansion. Mary Louise Pratt's study of the genres and conventions of 18th- and 19th-century exploration narratives about South America and Africa (e.g., the "monarch of all I survey" trope) offered ways of thinking about travel writing as embedded within relations of power between metropole and periphery, as did Edward Said's theories of representation and cultural imperialism. Particularly Said's book, Orientalism, helped scholars understand ways in which representations of people in travel texts were intimately bound up with notions of self, in this case, that the Occident defined itself through essentialist, ethnocentric, and racist representations of the Orient. Said's work became a model for demonstrating cultural forms of imperialism in travel texts, showing how the political, economic, or administrative fact of dominance relies on legitimating discourses such as those articulated through travel writing.

Feminist geographers' studies of travel writing challenge the masculinist history of geography by questioning who and what are relevant subjects of geographic study and, indeed, what counts as geographic knowledge itself. Such questions are worked through ideological constructs that posit men as explorers and women as travelers—or, conversely, men as travelers and women as tied to the home. Studies of Victorian women who were professional travel writers, tourists, wives of colonial administrators, and other (mostly) elite women who wrote narratives about their experiences abroad during the 19th century have been particularly revealing. From a "liberal" feminist perspective, travel presented one means toward female liberation for middle- and upper-class Victorian women. Many studies from the 1970s onward demonstrated the ways in which women's gendered identities were negotiated differently "at home" than they were "away," thereby showing women's self-development through travel. The more recent poststructural turn in studies of Victorian travel writing has focused attention on women's diverse and fragmented identities as they narrated their travel experiences, emphasizing women's sense of themselves as women in new locations, but only as they worked

through their ties to nation, class, whiteness, and colonial and imperial power structures.

1. According to the passage, Said's book, "Orientalism":

1. explained the difference between the representation of people and the actual fact.

2. illustrated how narrow minded and racist westerners were.

3. argued that cultural imperialism was more significant than colonial domination.

4. demonstrated how cultural imperialism was used to justify colonial domination

2. From the passage, it can be inferred that scholars argue that Victorian women experienced self-development through their travels because:

1. their identity was redefined when they were away from home.

2. they were on a quest to discover their diverse identities.

3. they were from the progressive middle- and upper-classes of society.

4. they developed a feminist perspective of the world

3. From the passage, we can infer that feminist scholars' understanding of the experiences of Victorian women travellers is influenced by all of the following EXCEPT scholars':

1. awareness of gender issues in Victorian society.

2. awareness of the ways in which identity is formed.

3. perspective that they bring to their research.

4. knowledge of class tensions in Victorian society.

4. American travel literature of the 1920s:

1. developed the male protagonists' desire for independence.

2. showed participation in local traditions.

3. presented travellers' discovery of their identity as different from others.

4. celebrated the freedom that travel gives.

5. From the passage, we can infer that travel writing is most similar to:

1. historical fiction
2. political journalism
3. feminist writing
4. autobiographical writing

DIRECTIONS ***for question 6 to 9:*** *The passage below is accompanied by a set of questions. Choose the best answer to each question.*

Passage - II

Although one of the most contested concepts in political philosophy, human nature is something on which most people seem to agree. By and large, according to Rutger Bregman in his new book Humankind, we have a rather pessimistic view – not of ourselves exactly, but of everyone else. We see other people as selfish, untrustworthy and dangerous and therefore we behave towards them with defensiveness and suspicion. This was how the 17th-century philosopher Thomas Hobbes conceived our natural state to be, believing that all that stood between us and violent anarchy was a strong state and firm leadership.

But in following Hobbes, argues Bregman, we ensure that the negative view we have of human nature is reflected back at us. He instead puts his faith in Jean-Jacques Rousseau, the 18th-century French thinker, who famously declared that man was born free and it was civilisation – with its coercive powers, social classes and restrictive laws – that put him in chains.

Hobbes and Rousseau are seen as the two poles of the human nature argument and it's no surprise that Bregman strongly sides with the Frenchman. He takes Rousseau's intuition and paints a picture of a prelapsarian idyll in which, for the better part of 300,000 years, Homo sapiens lived a fulfilling life in harmony with nature . . . Then we discovered agriculture and for the next 10,000 years it was all property, war, greed and injustice. . . .

It was abandoning our nomadic lifestyle and then domesticating animals, says Bregman, that brought about infectious diseases such as measles, smallpox, tuberculosis, syphilis, malaria, cholera and plague. This may be true, but what Bregman never really seems to get to grips with is that pathogens were not the only things that grew with agriculture – so did the number of humans. It's one thing to maintain friendly relations and

a property-less mode of living when you're 30 or 40 hunter-gatherers following the food. But life becomes a great deal more complex and knowledge far more extensive when there are settlements of many thousands.

"Civilisation has become synonymous with peace and progress and wilderness with war and decline," writes Bregman. "In reality, for most of human existence, it was the other way around." Whereas traditional history depicts the collapse of civilisations as "dark ages" in which everything gets worse, modern scholars, he claims, see them more as a reprieve, in which the enslaved gain their freedom and culture flourishes. Like much else in this book, the truth is probably somewhere between the two stated positions.

In any case, the fear of civilisational collapse, Bregman believes, is unfounded. It's the result of what the Dutch biologist Frans de Waal calls "veneer theory" – the idea that just below the surface, our bestial nature is waiting to break out. There's a great deal of reassuring human decency to be taken from this bold and thought-provoking book and a wealth of evidence in support of the contention that the sense of who we are as a species has been deleteriously distorted. But it seems equally

misleading to offer the false choice of Rousseau and Hobbes when, clearly, humanity encompasses both.

6. The author has differing views from Bregman regarding:

1. a civilised society being coercive and unjust.

2. a property-less mode of living being socially harmonious.

3. the role of agriculture in the advancement of knowledge.

4. the role of pathogens in the spread of infectious diseases.

7. According to the author, the main reason why Bregman contrasts life in pre- agricultural societies with agricultural societies is to:

1. make the argument that an environmentally conscious lifestyle is a more harmonious way of living.

2. bolster his argument that people are basically decent, but progress as we know it can make them selfish.

3. advocate the promotion of less complex societies as a basis for greater security and prosperity.

4. highlight the enormous impact that settled farming had on population growth.

8. According to the passage, the "collapse of civilisations" is viewed by Bregman as:

1. a time that enables changes in societies and cultures.

2. a sign of regression in society's trajectory.

3. a temporary phase which can be rectified by social action.

4. resulting from a breakdown in the veneer of human nature.

9. None of the following views is expressed in the passage EXCEPT that:

1. Bregman agrees with Hobbes that firm leadership is needed to ensure property rights and regulate strife.

2. Hobbes and Rousseau disagreed on the fundamental nature of humans, but both believed in the need for a strong state.

3. the author of the review believes in the veneer theory of human nature.

4. most people agree with Hobbes' pessimistic view of human nature as being intrinsically untrustworthy and selfish.

DIRECTIONS *for question 10 to 13:* *The passage below is accompanied by a set of questions. Choose the best answer to each question.*

Passage - III

[There is] a curious new reality: Human contact is becoming a luxury good. As more screens appear in the lives of the poor, screens are disappearing from the lives of the rich. The richer you are, the more you spend to be off-screen. . . .

The joy — at least at first — of the internet revolution was its democratic nature. Facebook is the same Facebook whether you are rich or poor. Gmail is the same Gmail. And it's all free. There is something mass market and unappealing about that. And as studies show that time on these advertisement-support platforms is unhealthy, it all starts to seem déclassé, like drinking soda or smoking cigarettes, which wealthy people do less than poor people. The wealthy can afford to opt out of having their

data and their attention sold as a product. The poor and middle class don't have the same kind of resources to make that happen.

Screen exposure starts young. And children who spent more than two hours a day looking at a screen got lower scores on thinking and language tests, according to early results of a landmark study on brain development of more than 11,000 children that the National Institutes of Health is supporting. Most disturbingly, the study is finding that the brains of children who spend a lot of time on screens are different. For some kids, there is premature thinning of their cerebral cortex. In adults, one study found an association between screen time and depression. . . .

Tech companies worked hard to get public schools to buy into programs that required schools to have one laptop per student, arguing that it would better prepare children for their screen- based future. But this idea isn't how the people who actually build the screen-based future raise their own children. In Silicon Valley, time on screens is increasingly seen as unhealthy. Here, the popular elementary school is the local Waldorf School, which promises a back-to- nature, nearly screen-free education. So as wealthy kids are growing up with less

screen time, poor kids are growing up with more. How comfortable someone is with human engagement could become a new class marker.

Human contact is, of course, not exactly like organic food But with screen time, there has been a concerted effort on the part of Silicon Valley behemoths to confuse the public. The poor and the middle class are told that screens are good and important for them and their children. There are fleets of psychologists and neuroscientists on staff at big tech companies working to hook eyes and minds to the screen as fast as possible and for as long as possible. And so human contact is rare. . . .

There is a small movement to pass a “right to disconnect” bill, which would allow workers to turn their phones off, but for now a worker can be punished for going offline and not being available. There is also the reality that in our culture of increasing isolation, in which so many of the traditional gathering places and social structures have disappeared, screens are filling a crucial void.

10. Which of the following statements about the negative effects of screen time is the author least likely to endorse?

1. It can cause depression in viewers.

2. It is designed to be addictive.

3. It increases human contact as it fills an isolation void.

4. It is shown to have adverse effects on young children's learning.

11. The author is least likely to agree with the view that the increase in screen-time is fuelled by the fact that:

1. screens provide social contact in an increasingly isolating world.

2. with falling costs, people are streaming more content on their devices.

3. some workers face punitive action if they are not online.

4. there is a growth in computer-based teaching in public schools

12. The author claims that Silicon Valley tech companies have tried to "confuse the public" by:

1. promoting screen time in public schools while opting for a screen-free education for their own children.

2. developing new work-efficiency programmes while lobbying for the "right to disconnect" bill.

3. concealing the findings of psychologists and neuroscientists on screen-time use from the public.

4. pushing for greater privacy while working with advertisement-support platforms to mine data.

13. The statement "The richer you are, the more you spend to be off-screen" is supported by which other line from the passage?

1. "How comfortable someone is with human engagement could become a new class marker."

2. screens are filling a crucial void."

3. . . . studies show that time on these advertisement-support platforms is unhealthy . .

4. "Gmail is the same Gmail. And it's all free."

DIRECTIONS ***for question 14 to 18:*** *The passage below is accompanied by a set of questions. Choose the best answer to each question.*

Passage - IV

I've been following the economic crisis for more than two years now. I began working on the subject as part of the background to a novel, and soon realized that I had stumbled across the most interesting story I've ever found. While I was beginning to work on it, the British bank Northern Rock blew up, and it became clear that, as I wrote at the time, "If our laws are not extended to control the new kinds of super-powerful, super-complex, and potentially super- risky investment vehicles, they will one day cause a financial disaster of global-systemic proportions." . . . I was both right and too late, because all the groundwork for the crisis had already been done—though the sluggishness of the world's governments, in not preparing for the great unraveling of autumn 2008, was then and still is stupefying. But this is the first reason why I wrote this book: because what's happened is extraordinarily interesting. It is an absolutely amazing story, full of human interest and drama, one whose byways of mathematics, economics, and psychology are both central to the story of the last decades and

mysteriously unknown to the general public. We have heard a lot about “the two cultures” of science and the arts—we heard a particularly large amount about it in 2009, because it was the fiftieth anniversary of the speech during which C. P. Snow first used the phrase. But I’m not sure the idea of a huge gap between science and the arts is as true as it was half a century ago—it’s certainly true, for instance, that a general reader who wants to pick up an education in the fundamentals of science will find it easier than ever before. It seems to me that there is a much bigger gap between the world of finance and that of the general public and that there is a need to narrow that gap, if the financial industry is not to be a kind of priesthood, administering to its own mysteries and feared and resented by the rest of us. Many bright, literate people have no idea about all sorts of economic basics, of a type that financial insiders take as elementary facts of how the world works. I am an outsider to finance and economics, and my hope is that I can talk across that gulf.

My need to understand is the same as yours, whoever you are. That’s one of the strangest ironies of this story: after decades in which the ideology of the Western world was personally and economically individualistic, we’ve

suddenly been hit by a crisis which shows in the starkest terms that whether we like it or not—and there are large parts of it that you would have to be crazy to like—we're all in this together. The aftermath of the crisis is going to dominate the economics and politics of our societies for at least a decade to come and perhaps longer.

14. Which one of the following best captures the main argument of the last paragraph of the passage?

1. Whoever you are, you would be crazy to think that there is no crisis.

2. The aftermath of the crisis will strengthen the central ideology of individualism in the Western world.

3. The ideology of individualism must be set aside in order to deal with the crisis.

4. In the decades to come, other ideologies will emerge in the aftermath of the crisis.

15. Which one of the following, if true, would be an accurate inference from the first sentence of the passage?

1. The author's preoccupation with the economic crisis is not less than two years old.

2. The economic crisis outlasted the author's preoccupation with it.

3. The author has witnessed many economic crises by travelling a lot for two years.

4. The author is preoccupied with the economic crisis because he is being followed.

16. Which one of the following, if false, could be seen as supporting the author's claims?

1. Most people are yet to gain any real understanding of the workings of the financial world.

2. The global economic crisis lasted for more than two years.

3. The huge gap between science and the arts has steadily narrowed over time.

4. The economic crisis was not a failure of collective action to rectify economic problems.

17. All of the following, if true, could be seen as supporting the arguments in the passage, EXCEPT:

1. The difficulty with understanding financial matters is that they have become so arcane.

2. Economic crises could be averted by changing prevailing ideologies and beliefs.

3. The story of the economic crisis is also one about international relations, global financial security, and mass psychology.

4. The failure of economic systems does not necessarily mean the failure of their ideologies.

18. According to the passage, the author is likely to be supportive of which one of the following programmes?

1. An educational curriculum that promotes economic research.

2. Economic policies that are more sensitively calibrated to the fluctuations of the market.

3. An educational curriculum that promotes developing financial literacy in the masses.

4. The complete nationalisation of all financial institutions.

DIRECTIONS *for the question:* Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

19. 1. Machine learning models are prone to learning human-like biases from the training data that feeds these algorithms.

2. Hate speech detection is part of the on-going effort against oppressive and abusive language on social media.

3. The current automatic detection models miss out on something vital: context.

4. It uses complex algorithms to flag racist or violent speech faster and better than human beings alone.

5. For instance, algorithms struggle to determine if group identifiers like "gay" or "black" are used in offensive or prejudiced ways because they're trained on imbalanced datasets with unusually high rates of hate speech.

DIRECTIONS *for the question:* The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

20. Aesthetic political representation urges us to realize that 'the representative has autonomy with regard to the people represented' but autonomy then is not an excuse to abandon one's responsibility. Aesthetic autonomy requires cultivation of 'disinterestedness' on the part of actors which is not indifference. To have disinterestedness, that is, to have comportment towards the beautiful that is devoid of all ulterior references to use – requires a kind of aesthetic commitment; it is the liberation of ourselves for the release of what has proper worth only in itself.

1. Aesthetic political representation advocates autonomy for the representatives drawing from disinterestedness, which itself is different from indifference.

2. Aesthetic political representation advocates autonomy for the representatives manifested through disinterestedness which itself is different from indifference.

3. Disinterestedness is different from indifference as the former means a non-subjective evaluation of things which is what constitutes aesthetic political representation.

4. Disinterestedness, as distinct from indifference, is the basis of political representation.

DIRECTIONS *for the question:* Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

21. 1. The logic of displaying one's inner qualities through outward appearance was based on a distinction between being a woman and being feminine.

2. 'Appearance' became a signifier of conduct - to look was to be and conformity to the feminine ideal was measured by how well women could use the tools of the fashion and beauty industries.

3. The makeover-centric media sets out subtly and not-so-subtly, 'good' and 'bad' ways to be a woman, layering these over inequalities of race and class.

4. The denigration of working-class women and women of colour often centres on their perceived failure to embody feminine beauty.

5. 'Woman' was considered a biological category, but femininity was a 'process' by which women became specific kinds of women.

DIRECTIONS ***for questions 22 - 23:*** The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

22. 1. Each one personified a different aspect of good fortune.

2. The others were versions of popular Buddhist gods, Hindu gods and Daoist gods.

3. Seven popular Japanese deities, the Shichi Fukujin, were considered to bring good luck and happiness.

4. Although they were included in the Shinto pantheon, only two of them, Daikoku and Ebisu, were indigenous Japanese gods.

23. 1. Complex computational elements of the CNS are organized according to a “nested” hierarchic criterion; the organization is not permanent and can change dynamically from moment to moment as they carry out a computational task.

2. Echolocation in bats exemplifies adaptation produced by natural selection; a function not produced by natural selection for its current use is exaptation -- feathers might have originally arisen in the context of selection for insulation.

3. From a structural standpoint, consistent with exaptation, the living organism is organized as a complex of “Russian Matryoshka Dolls” -- smaller structures are contained within larger ones in multiple layers.

4. The exaptation concept, and the Russian-doll organization concept of living beings deduced from studies on evolution of the various apparatuses in mammals, can be applied for the most complex human organ: the central nervous system (CNS).

DIRECTIONS ***for questions 24 - 25:*** The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

24. The dominant hypotheses in modern science believe that language evolved to allow humans to exchange factual information about the physical world. But an alternative view is that language evolved, in modern humans at least, to facilitate social bonding. It increased our ancestors' chances of survival by enabling them to hunt more successfully or to cooperate more extensively. Language meant that things could be explained and that plans and past experiences could be shared efficiently.

1. Most believe that language originated from a need to articulate facts, but others think it emerged from the need to promote social cohesion and cooperation, thus enabling human survival.

2. From the belief that humans invented language to process factual information, scholars now think that language was the outcome of the need to ensure social cohesion and thus human survival.

3. Since its origin, language has been continuously evolving to higher forms, from being used to identify objects to ensuring human survival by enabling our ancestors to bond and cooperate.

4. Experts are challenging the narrow view of the origin of language, as being merely used to describe facts and label objects, to being necessary to promote more complex interactions among humans.

25. Brown et al. (2001) suggest that 'metabolic theory may provide a conceptual foundation for much of ecology just as genetic theory provides a foundation for much of evolutionary biology'. One of the successes of genetic theory is the diversity of theoretical approaches and models that have been developed and applied. A Web of Science (v. 5.9. Thomson Reuters) search on genetic* + theor* + evol* identifies more than 12000 publications between 2005 and 2012. Considering only the 10 most-cited papers within this 12000 publication set, genetic theory can be seen to focus on genome dynamics, phylogenetic inference, game theory and the regulation of gene expression. There is no one fundamental genetic equation, but

rather a wide array of genetic models, ranging from simple to complex, with differing inputs and outputs, and divergent areas of application, loosely connected to each other through the shared conceptual foundation of heritable variation.

1. Genetic theory has a wide range of theoretical approaches and applications and Metabolic theory must have the same in the field of ecology.

2. Genetic theory has evolved to spawn a wide range of theoretical models and applications but Metabolic theory need not evolve in a similar manner in the field of ecology.

3. Genetic theory has a wide range of theoretical approaches and application and is foundational to evolutionary biology and Metabolic theory has the potential to do the same for ecology.

4. Genetic theory provides an example of how a range of theoretical approaches and applications can make a theory successful.

DIRECTIONS *for the question:* The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

26. 1. It advocated a conservative approach to antitrust enforcement that espouses faith in efficient markets and voiced suspicion regarding the merits of judicial intervention to correct anticompetitive practices.

2. Many industries have consistently gained market share, the lion's share - without any official concern; the most successful technology companies have grown into veritable titans, on the premise that they advance 'public interest'.

3. That the new anticompetitive risks posed by tech giants like Google, Facebook, and Amazon, necessitate new legal solutions could be attributed to the dearth of enforcement actions against monopolies and the few cases challenging mergers in the USA.

4. The criterion of 'consumer welfare standard' and the principle that antitrust law should serve

consumer interests and that it should protect competition rather than individual competitors was an antitrust law introduced by, and named after, the 'Chicago school'.

Section - II: DI & LR

DIRECTION ***for questions 27 to 30****: Study the following table given below and answer the question that follows.*

Sixteen patients in a hospital must undergo a blood test for a disease. It is known that exactly one of them has the disease. The hospital has only eight testing kits and has decided to pool blood samples of patients into eight vials for the tests. The patients are numbered 1 through 16, and the vials are labelled A, B, C, D, E, F, G, and H. The following table shows the vials into which each patient's blood sample is distributed.

Patient	Vials	Patient	Vials
1	B, D, F, H	9	A, D, F, H
2	B, D, F, G	10	A, D, F, G
3	B, D, E, H	11	A, D, E, H
4	B, D, E, G	12	A, D, E, G
5	B, C, F, H	13	A, C, F, H
6	B, C, F, G	14	A, C, F, G
7	B, C, E, H	15	A, C, E, H
8	B, C, E, G	16	A, C, E, G

If a patient has the disease, then each vial containing his/her blood sample will test positive. If a vial tests positive, one of the patients whose blood samples were

mixed in the vial has the disease. If a vial tests negative, then none of the patients whose blood samples were mixed in the vial has the disease.

27. Suppose vial C tests positive and vials A, E and H test negative. Which patient has the disease?

1. Patient 2
2. Patient 6
3. Patient 14
4. Patient 8

28. Suppose vial A tests positive and vials D and G test negative. Which of the following vials should we test next to identify the patient with the disease?

1. Vial C
2. Vial H
3. Vial B
4. Vial E

29. Which of the following combinations of test results is NOT possible?

1. Vial B positive, vials C, F and H negative
2. Vials B and D positive, vials F and H negative
3. Vials A and E positive, vials C and D negative
4. Vials A and G positive, vials D and E negative

30. Suppose one of the lab assistants accidentally mixed two patients' blood samples before they were distributed to the vials. Which of the following

correctly represents the set of all possible numbers of positive test results out of the eight vials?

1. {5,6,7,8}
2. {4,5}
3. {4,5,6,7,8}
4. {4,5,6,7}

DIRECTIONS *for questions 31 to 36:* *Read the information given below and answer the question that follows.*

The Hi-Lo game is a four-player game played in six rounds. In every round, each player chooses to bid Hi or Lo. The bids are made simultaneously. If all four bid Hi, then all four lose 1 point each. If three players bid Hi and one bids Lo, then the players bidding Hi gain 1 point each and the player bidding Lo loses 3 points. If two players bid Hi and two bid Lo, then the players bidding Hi gain 2 points each and the players bidding Lo lose 2 points each. If one player bids Hi and three bid Lo, then the player bidding Hi gains 3 points and the players bidding Lo lose 1 point each. If all four bid Lo, then all four gain 1 point each.

Four players Arun, Bankim, Charu, and Dipak played the Hi-Lo game. The following facts are known about their game:

1. At the end of three rounds, Arun had scored 6 points, Dipak had scored 2 points, Bankim and Charu had scored -2 points each.

2. At the end of six rounds, Arun had scored 7 points, Bankim and Dipak had scored -1 point each, and Charu had scored -5 points.

3. Dipak's score in the third round was less than his score in the first round but was more than his score in the second round.

4. In exactly two out of the six rounds, Arun was the only player who bid Hi.

31. What were the bids by Arun, Bankim, Charu and Dipak, respectively in the first round?

1. Lo, Lo, Lo, Hi
2. Hi, Lo, Lo, Hi
3. Hi, Hi, Lo, Lo
4. Hi, Lo, Lo, Lo

32. In how many rounds did Arun bid Hi?

33. In how many rounds did Bankim bid Lo?

34. In how many rounds did all four players make identical bids?

35. In how many rounds did Dipak gain exactly 1 point?

36. In which of the following rounds, was Arun DEFINITELY the only player to bid Hi?

1. Second 2. Fourth 3. Third 4. First

DIRECTIONS ***for questions 37 to 40:*** *Read the information given below and answer the question that follows.*

A survey of 600 schools in India was conducted to gather information about their online teaching learning processes (OTLP). The following four facilities were studied.

F1: Own software for OTLP

F2: Trained teachers for OTLP

F3: Training materials for OTLP

F4: All students having Laptops

The following observations were summarized from the survey.

1. 80 schools did not have any of the four facilities – F1, F2, F3, F4.
2. 40 schools had all four facilities.
3. The number of schools with only F1, only F2, only F3, and only F4 was 25, 30, 26 and 20 respectively.
4. The number of schools with exactly three of the facilities was the same irrespective of which three were considered.
5. 313 schools had F2.
6. 26 schools had only F2 and F3 (but neither F1 nor F4).
7. Among the schools having F4, 24 had only F3, and 45 had only F2.
8. 162 schools had both F1 and F2.
9. The number of schools having F1 was the same as the number of schools having F4.

37. What was the total number of schools having exactly three of the four facilities?

1. 200 2. 50 3. 64 4. 80

38. What was the number of schools having facilities F2 and F4?

1. 85 2. 95 3. 45 4. 185

39. What was the number of schools having only facilities F1 and F3?

40. What was the number of schools having only facilities F1 and F4?

DIRECTIONS ***for questions 41 to 44:*** *Read the information given below and answer the question that follows.*

XYZ organization got into the business of delivering groceries to home at the beginning of the last month. They have a two-day delivery promise. However, their deliveries are unreliable. An order booked on a particular day may be delivered the next day or the day after. If the order is not delivered at the end of two days, then the order is declared as lost at the end of the second day. XYZ then does not deliver the order, but informs the customer, marks the order as lost, returns the payment and pays a penalty for non-delivery.

The following table provides details about the operations of XYZ for a week of the last month. The first column gives the date, the second gives the cumulative number of orders that were booked up to and including that day.

The third column represents the number of orders delivered on that day. The last column gives the cumulative number of orders that were lost up to and including that day.

It is known that the numbers of orders that were booked on the 11th, 12th, and 13th of the last month that took two days to deliver were 4, 6, and 8 respectively.

Day	Cumulative orders booked	Orders delivered on day	Cumulative orders lost
13th	219	11	91
14th	249	27	92
15th	277	23	94
16th	302	11	106
17th	327	21	118
18th	332	13	120
19th	337	14	129

41. Among the following days, the largest fraction of orders booked on which day was lost?

1. 13^{th} 2. 16^{th} 3. 15^{th} 4. 14^{th}

42. On which of the following days was the number of orders booked the highest?

1. 15^{th} 2. 13^{th} 3. 14^{th} 4. 12^{th}

43. The delivery ratio for a given day is defined as the ratio of the number of orders booked on that day which are delivered on the next day to the number of orders booked on that day which are delivered on the second day after booking. On which of the following days, was the delivery ratio the highest?

1. 13^{th} 2. 15^{th} 3. 14^{th} 4. 16^{th}

44. The average time taken to deliver orders booked on a particular day is computed as follows. Let the number of orders delivered the next day be x and the number of orders delivered the day after be y. Then the average time to deliver order is (x+2y)/(x+y). On which of the following days was the average time taken to deliver orders booked the least?

1. 16^{th} 2. 15^{th} 3. 13^{th} 4. 14^{th}

DIRECTIONS ***for questions 45 to 50:*** *Read the information given below and answer the question that follows.*

A farmer had a rectangular land containing 205 trees. He distributed that land among his four daughters – Abha, Bina, Chitra and Dipti by dividing the land into twelve plots along three rows (X,Y,Z) and four Columns (1,2,3,4) as shown in the figure below:

	1	2	3	4
X	12 C			
Y	21 A			A
Z	B	C	9	28

The plots in rows X, Y, Z contained mango, teak and pine trees respectively. Each plot had trees in non-zero multiples of 3 or 4 and none of the plots had the same number of trees. Each daughter got an even number of plots. In the figure, the number mentioned in top left corner of a plot is the number of trees in that plot, while the letter in the bottom right corner is the first letter of the name of the daughter who got that plot (For example, Abha got the plot in row Y and column 1 containing 21 trees). Some information in the figure got erased, but the following is known:

1. Abha got 20 trees more than Chitra but 6 trees less than Dipti.
2. The largest number of trees in a plot was 32, but it was not with Abha.
3. The number of teak trees in Column 3 was double of that in Column 2 but was half of that in Column 4.

4. Both Abha and Bina got a higher number of plots than Dipti.
5. Only Bina, Chitra and Dipti got corner plots.
6. Dipti got two adjoining plots in the same row.
7. Bina was the only one who got a plot in each row and each column.
8. Chitra and Dipti did not get plots which were adjacent to each other (either in row / column / diagonal).
9. The number of mango trees was double the number of teak trees.

45. How many mango trees were there in total?

1. 49
2. 98
3. 126
4. 84

46. Which of the following is the correct sequence of trees received by Abha, Bina, Chitra and Dipti in that order?

1. 60, 39, 40, 66
2. 50, 69, 30, 56
3. 44, 87, 24, 50
4. 54, 57, 34, 60

47. How many pine trees did Chitra receive?

1. 18
2. 15
3. 21
4. 30

48. Who got the plot with the smallest number of trees and how many trees did that plot have?

1. Bina, 3 trees
2. Dipti, 6 trees
3. Abha, 4 trees
4. Bina, 4 trees

49. Which of the following statements is NOT true?

1. Bina got 32 pine trees.
2. Dipti got 56 mango trees.
3. Chitra got 12 mango trees.
4. Abha got 41 teak trees.

50. Which column had the highest number of trees?

1. 2
2. 4
3. 3
4. Cannot be determined

Section - III: Quantitative Ability

51. Two alcohol solutions, A and B, are mixed in the proportion 1:3 by volume. The volume of the mixture is then doubled by adding solution A such that the resulting mixture has 72% alcohol. If solution A has 60% alcohol, then the percentage of alcohol in solution B is

1. 90% 2. 92% 3. 94% 4. 89%

52. Anil, Sunil, and Ravi run along a circular path of length 3 km, starting from the same point at the same time, and going in the clockwise direction. If they run at speeds of 15 km/hr, 10 km/hr, and 8 km/hr, respectively, how much distance in km will Ravi have run when Anil and Sunil meet again for the first time at the starting point?

1. 5.2 2. 4.6 3. 4.8 4. 4.2

53. The area, in sq. units, enclosed by the lines $x = 2$, $y = |x - 2| + 4$, the X-axis and the Y-axis is equal to

1. 10 2. 8 3. 6 4. 12

54. A and B are two railway stations 90 km apart. A train leaves A at 9:00 am, heading towards B at a speed of 40 km/hr. Another train leaves B at 10:30 am, heading towards A at a speed of 20 km/hr. The trains meet each other at

1. 11 : 45 am
2. 10 : 45 am
3. 11 : 00 am
4. 11 : 20 am

55. In the final examination, Bishnu scored 52% and Asha scored 64%. The marks obtained by Bishnu is 23 less, and that by Asha is 34 more than the marks obtained by Ramesh. The marks obtained by Geeta, who scored 84%, is

1. 399
2. 417
3. 439
4. 357

56. If $\log_a 30 = A$, $\log_a(5/3) = -B$ and $\log_2 a = 1/3$, then $\log_3 a$ equals

1. $\frac{2}{A+B} - 3$
2. $\frac{2}{A+B-3}$
3. $\frac{A+B}{2} - 3$
4. $\frac{A+B-3}{2}$

57. In a trapezium ABCD, AB is parallel to DC, BC is perpendicular to DC and $\angle BAD = 45°$. If DC = 5 cm, BC = 4cm, the area of the trapezium in sq cm is

58. If f(x + y) = f (x) f (y) and f(5) = 4, then f (10) - f (-10) is equal to

1. 14.0625 2. 3 3. 0 4. 15.9375

59. $\frac{2\times4\times8\times16}{(\log_2 4)^2(\log_4 8)^3(\log_8 16)^4}$ equals

60. Let N, x and y be positive integers such that N = x + y, 2 < x < 10 and 14 < y < 23. If N > 25, then how many distinct values are possible for N?

61. A man buys 35 kg of sugar and sets a marked price in order to make a 20% profit. He sells 5 kg at this price, and 15 kg at a 10% discount. Accidentally, 3 kg of sugar is wasted. He sells the remaining sugar by raising the marked price by p percent so as to make an overall profit of 15%. Then p is nearest to

1. 25 2. 22 3. 31 4. 35

62. Vimla starts for office every day at 9 am and reaches exactly on time if she drives at her usual speed of 40 km/hr. She is late by 6 minutes if she drives at 35 km/hr. One day, she covers two-thirds

of her distance to office in one-thirds of her usual time to reach office, and then stops for 8 minutes. The speed, in km/hr, at which she should drive the remaining distance to reach office exactly on time is

1. 27 2. 28 3. 26 4. 29

63. How many integers in the set {100, 101, 102, ..., 999} have at least one digit repeated?

64. A batsman played n + 2 innings and got out on all occasions. His average score in these n + 2 innings was 29 runs and he scored 38 and 15 runs in the last two innings. The batsman scored less than 38 runs in each of the first n innings. In these n innings, his average score was 30 runs and lowest score was x runs. The smallest possible value of x is

1. 1 2. 2 3. 3 4. 4

65. Let k be a constant. The equations kx + y = 3 and 4x + ky = 4 have a unique solution if and only if

1. $k \neq 2$ 2. $|k| = 2$
3. $k = 2$ 4. $|k| \neq 2$

66. Dick is thrice as old as Tom and Harry is twice as old as Dick. If Dick's age is 1 year less than the average age of all three, then Harry's age, in years, is

67. The vertices of a triangle are (0, 0), and (4, 0) and (3, 9). The area of the circle passing through these three points is

1. $\frac{12\pi}{5}$ 2. $\frac{14\pi}{5}$ 3. $\frac{205\pi}{9}$ 4. $\frac{123\pi}{7}$

68. A person invested a certain amount of money at 10% annual interest, compounded half-yearly. After one and a half years, the interest and principal together became Rs 18522. The amount, in rupees, that the person had invested is

69. If a, b, c are non-zero and $14^a = 36^b = 84^c$, then $6b\left(\frac{1}{c}-\frac{1}{a}\right)$ is equal to

70. The points (2, 1) and (-3, -4) are opposite vertices of a parallelogram. If the other two vertices lie on the line x + 9y + c = 0, then c is

1. 14 2. 15 3. 12 4. 13

71. Let m and n be natural numbers such that n is even and $0.2 < \frac{m}{20}, \frac{n}{m}, \frac{n}{11} < 0.5.$

Then m - 2n equals

1. 2 2. 4 3. 3 4. 1

72. If $x_1 = -1$ and $x_m = x_{m+1} + (m + 1)$ for every positive integer m, then x_{100} equals

1. -5150 2. -5051 3. -5050 4. -5151

73. How many of the integers 1, 2, ….., 120, are divisible by none of 2, 5 and 7?

1. 40 2. 42 3. 41 4. 43

74. A contractor agreed to construct a 6 km road in 200 days. He employed 140 persons for the work. After 60 days, he realized that only 1.5 km road has been completed. How many additional people would he need to employ in order to finish the work exactly on time?

75. How many pairs (a, b) of positive integers are there such that $a \leq b$ and $ab = 4^{2017}$?

1. 2017 2. 2019 3. 2018 4. 2020

76. Let m and n be positive integers, If $x^2 + mx + 2n = 0$ and $x^2 + 2nx + m = 0$ have real roots, then the smallest possible value of m + n is

1. 5 2. 8 3. 7 4. 6

Answer Key & Explanation

Q. No.	Key	Explanations
1.	4	Refer to this line of the second paragraph - that the Occident defined itself through essentialist, ethnocentric, and **racist representations of the Orient.** Orientalism means style, artefacts, or traits considered characteristic of the peoples and cultures of Asia. The representation of Asia in a stereotyped way that is regarded as embodying a **colonialist attitude**.
2.	1	Refer to this line of the last paragraph – Many studies from the 1970s onward demonstrated the ways in which women's gendered identities were negotiated differently "at home" than they were "away,"
3.	4	There isn't any significant mention or stress laid upon the class conflict or class tensions in the passage.
4.	4	Refer to the last line of the first paragraph – "male protagonists "discovering themselves" on their journeys, emphasizing the **independence of road travel** and the value of rural folk traditions." So travel literature of the 1920s may or may not

		have developed the male protagonists' desire for independence but they definitely enjoyed the freedom that it gave. Also they did discover themselves, similar or different than others is not mentioned in the passage. To participate and to value something are different things.
5.	4	As travel writing is what travelers wrote about their experiences hence Option 4 is the correct answer.
6.	1	This line of the last paragraph reflects the author's viewpoit – "In any case, the fear of civilisational collapse, Bregman believes, is unfounded. It's the result of what the Dutch biologist Frans de Waal calls "veneer theory" – the idea that just below the surface, our bestial nature is waiting to break out." This line of first paragraph reflects the thought process of Bregman - "By and large, according to Rutger Bregman in his new book Humankind, we have a rather pessimistic view – not of ourselves exactly, but of everyone else."
7.	2	Refer to this line of the third paragraph – "Then we discovered agriculture and for the next 10,000 years it was all property, war, **greed** and injustice. . . ."
8.	1	Refer to this line of the second last paragraph – "he claims, see them more as a reprieve, in which the enslaved gain their freedom and

		culture flourishes."
9.	4	This question is asking to point out something which is mentioned in the passage. Option 4 finds reference in this line of the first paragraph – "By and large, according to Rutger Bregman in his new book Humankind, we have a rather pessimistic view – not of ourselves exactly, but of everyone else."
10.	3	The question asks which the negative effects of screen time are the author least likely to endorse i.e. it is asking for a positive effect, which is presented in Option 3 only.
11.	2	There is no mention of the 'cost' factor playing any role for increased screen time, mentioned in the passage.
12.	1	Confusion would happen only when one says or does two different things, which is reflected only in option 1.
13.	1	Refer to the first line of the passage – "[There is] a curious new reality: Human contact is becoming a luxury good"
14.	3	Refer to the last line of the paragraph – "we've suddenly been hit by a crisis which shows in the starkest terms that whether we like it or not—and there are large parts of it that you would have to be crazy to like—we're all in this together." All the information stated before by

		the author is to lead the discussion to this end.
15.	1	As the author has been occupied with the economic crisis for more than two years, so it cannot definitely be less than 2 years.
16.	4	Refer to this line of the first paragraph – "—though the sluggishness of the world's governments, in not preparing for the great unraveling of autumn 2008, was then and still is stupefying". Negating Option 4 will strengthen author's viewpoint.
17.	4	Option 1 is supported by this line of the passage – "Many bright, literate people have no idea about all sorts of economic basic" Option 2 is supported by "after decades in which the ideology of the Western world was personally and economically individualistic……we're all in this together." Option 3 is supported by this line of the passage – "It is an absolutely amazing story, full of human interest and drama, one whose byways of mathematics, economics, and psychology ……."
18.	3	Option 1 points to research whereas a generic program would serve the purpose. Option 2 does not mention anything about raising awareness among masses. Option 4 is too extreme.

19.	3	The context is about the software (AI) to detect hate speech and to stop the spread of abusive language on social media. One sentence tells that what exactly it is based on. The flip side is that this machine learning models are prone to biases as seen in data fed to them. An example is also given to substantiate the same. 3 is odd one out as it talks about the 'context' which is nowhere mentioned i.e. machine cannot understand the context in which the word or the language has been used.
20.	1	The context moves around 'political representatives should have disinterested approach along with responsibility towards job and people. Also being 'disinterested 'does not mean 'being indifferent.
21.	3	The context moves around the distinction between being a woman and 'being feminine' To signify this difference, 'appearance' became the standard and ability to use the tools of fashion and beauty industries gained significance. Those who were not able to use them effectively to enhance feminine grace were denigrated. 3 talks about the role played by the media to fuel this thought process. Hence odd one out.

22.	3142	The opener is this case is 3 as it introduces the idea of seven popular Japanese deities. 'Each one' is linked to 3 as it is telling us 'what each signifies'. Then 4 will come as it tells that only two are Japanese and 'others' are popular Buddhist or Hindu gods.
23.	2431	The context moves around the result of 'adaptation' and 'exaptation'. That is a few of the features shown by animals may not have basis in natural selection. Hence the sentence 2 will be an opener. After this 4 will come as it further explains the basis of 'The exaptation concept, and the Russian-doll organization concept' can be applied to understand CNS. 3 explain another way of looking at these two processes. 1 will conclude as it tells that how CNS is not permanent in structural set up but changes from moment to moment.
24.	1	The paragraph has highlighted two definitions of 'how language evolved and its underlying purpose. Both the aspects have been captured well by option 1
25.	3	The key line is 'metabolic theory may provide a conceptual foundation for much of ecology just as genetic theory provides a foundation for much of evolutionary biology' Another important line ', genetic theory can be seen to focus on genome dynamics, phylogenetic

		inference, game theory and the regulation of gene expression.
26.	4123	The context talks about 'antitrust law' and how it has not served its purpose. After this 1 will come as it explains the approach adopted by this law. 2 shows the consequences. And finally new regulations are required to curb the tendencies to use loopholes in the existing system , which is evident from 'the dearth of enforcement actions against monopolies and the few cases challenging mergers in the USA'.
27.	2	Since vial C tests positive so the patient who has the disease has to be one of the following:- 5, 6, 7, 8, 13, 14, 15, 16, but as vial E tests negative so patients 15, 16, 7 and 8 are ruled out, similarly as vial H tests negative so patients 5 and 13 are also ruled out. Also as vial A tests negative so patients 13, 14, 15,16 are ruled out. Hence we are only left with patient 6 who has the disease.
28.	4	Since vial A tests positive and vials D and G test negative so from the given table the only possible patients with the disease can be 13 or 15. To eliminate between 13 and 15 numbered patients vial E or F can be tested as they both have vials A, C and H, as common vials. So answer is 4^{th} option

<table>
<tr><td>29.</td><td>3</td><td>Going by options, 1st option is possible and it will result into patient 4 being diseased.
2nd option is possible and it will result into patient 4, 8 or 12 being diseased
3rd option is not possible is not possible as it will result into making all the patients free from disease. 4th option is possible as it will result into patient 14 being diseased.
So, 3rd option is the correct answer.</td></tr>
<tr><td>30.</td><td>3</td><td>Since every patient's blood sample is there in 4 vials so with a mixing of two non-diseased patient's blood samples there will be 4 vials with positive test result. If the mixing of samples includes the sample of the patient suffering from disease then the number of vials testing positive can increase and become 5, 6, 7 or 8 depending upon the number of vials further testing positive because of the mix-up being 1, 2, 3 or 4 whish were earlier testing negative in case of no mix up. So the correct answer is 3rd option</td></tr>
<tr><td>31-36.</td><td colspan="2">As per the given conditions the table of first three rounds is given below- Table - I
<table>
<tr><th></th><th>Arun</th><th>Bankim</th><th>Charu</th><th>Dipak</th></tr>
<tr><td>Round 1</td><td>Hi (+2)</td><td>Lo (-2)</td><td>Lo (-2)</td><td>Hi (+2)</td></tr>
<tr><td>Round 2</td><td>Hi (+3)</td><td>Lo (-1)</td><td>Lo (-1)</td><td>Lo (-1)</td></tr>
<tr><td>Round 3</td><td>Lo (+1)</td><td>Lo (+1)</td><td>Lo (+1)</td><td>Lo (+1)</td></tr>
<tr><td>Total</td><td>6</td><td>-2</td><td>-2</td><td>2</td></tr>
</table></td></tr>
</table>

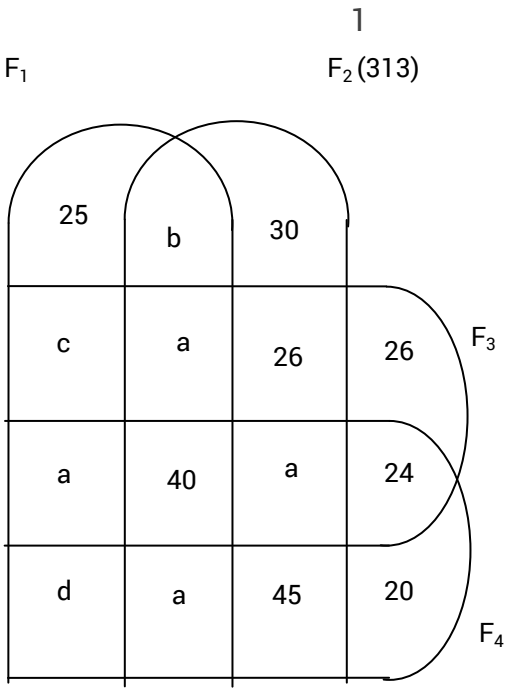
So, at the end of three rounds, Arun had scored 6 points, Dipak had scored 2 points, Bankim and Charu had scored -2 points each. Now with the further condition being given that at the end of six rounds, Arun had scored 7 points. Bankim and Dipak had scored 7 points, also with the condition that there has to be one more round after the first three rounds in which Arun was the only player who bid Hi, we can have the following combinations for Rounds 4, 5 & 6.

Table - II

Arun	Bankim	Charu	Dipak
Hi (+3)	Lo (-1)	Lo (-1)	Lo (-1)
Hi (-1)	Hi (-1)	Hi (-1)	Hi (-1)
Lo (-1)	Hi (+1)	Lo (-1)	Lo (-1)

31.	2	Refer to table I.
32.	4	Arun bid Hi in 4 rounds.
33.	4	Bankim bid Lo in 4 rounds
34.	2	All four players made identical bids in Round 3 and once again in one of rounds 4, 5 or 6. So this happened in 2 rounds.
35.	1	Dipak gained exactly 1 point only in round 3. So this happened only in one of the rounds.
36.	1	The only round we are sure about Arun being the only player to bid Hi so answer is 1st option.

37-40.



Number of schools who do not have any of these 4 facilities = 80

$2a + 40 + b = 162$……(1)

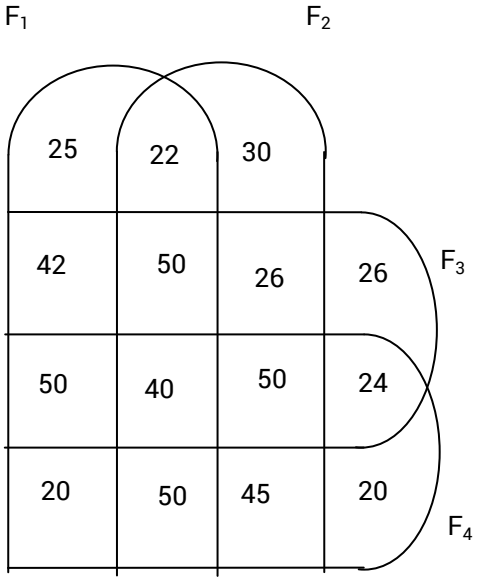
$162 + 30 + 26 + a + 45 = 313$…….(2). So $a = 50$.

Putting this value of a in equation (1), we get $b = 22$.

As the number of schools having F1 was the same as the number of schools having F4, so $25 + c + a + d + b + a + 40 + a = a + 40 + a + 24 + d + a + 45 + 20$

$\Rightarrow 25 + c + 22 + 40 = 129 \Rightarrow c = 42$.

Also $25 + c + a + d + 162 + 30 + 26 + a + 45 + 26 + 24 + 20 + 80 = 600$

	⇒ 25 + 42 + 50 + d + 162 + 30 + 26 + 50 + 45 + 26 + 24 + 20 + 20 + 80 = 600 ⇒ d = 20 So we get the final diagram as follows:  	
37.	1	Number of schools having exactly three of the four facilities = 50 + 50 + 50 + 50 = 200
38.	4	Number of schools having facilities F_2 and F_4 = 40 + 50 + 50 + 45 = 185
39.	42	Number of schools having only facilities F_1 and F_3 = 42
40.	20	Number of schools having only facilities F_1 and F_4 = 20

41-44. Firstly we will convert the cumulative values to normal frequency model. So the new table becomes

Day	Orders Booked	Orders Delivered	Orders Lost
13^{th}		11	
14^{th}	30	27	1
15^{th}	28	23	2
16^{th}	25	11	12
17^{th}	25	21	12
18^{th}	5	13	2
19^{th}	5	14	9

As is given that number of orders that were booked on 11^{th}, 12^{th} and 13^{th} of the last month that took 2 days to deliver were 4, 6 and 8 respectively, so we can say that on the 13^{th} day, the breakup of 11 orders which were delivered will be 4 + 7. Hence the remaining 7 orders must have been booked on 12^{th} day.

Similarly, we can get the breakup of 27 orders which were delivered on 14^{th} day will be 6 + 21. Hence the remaining 21 orders must have been booked on 13^{th} day.

Similarly, we can get the breakup of 23 orders which were delivered on 15^{th} day will be 8 + 15. Hence the remaining 15 orders must have been booked on 14^{th} day.

But we can see that there are 2 orders which are lost on 15^{th} day. These must have been booked on 13^{th} day.

As 12 orders on 16^{th} day are lost, so they must have been booked on 14^{th} day. So we can say that breakup of 11 orders on day 16 will be 3 + 8. Hence 3 orders delivered on 16^{th} day must have been ordered on 14^{th} day and remaining 8 orders must have been booked on 15^{th} day.

Moving in this pattern, we can find the breakup of 17^{th}, 18^{th} and 19^{th} day and we can get the final table as follows:

Day	Orders Booked	Orders Delivered (Day wise)	Orders Lost
13^{th}		4 (11^{th} day) + 7 (12^{th} day)	
14^{th}	30	6 (12^{th} day) + 21 (13^{th} day)	1
15^{th}	28	8 (13^{th} day) + 15 (14^{th} day)	2 (13^{th} day)
16^{th}	25	3 (14^{th} day) + 8 (15^{th} day)	12 (14^{th} day)
17^{th}	25	8 (15^{th} day) + 13 (16^{th} day)	12 (15^{th} day)
18^{th}	5	10 (16^{th} day) + 3 (17^{th} day)	2 (16^{th} day)
19^{th}	5	13 (17^{th} day) + 1 (18^{th} day)	9 (17^{th} day)

Now we can find the number of orders booked on 13^{th} day = 21 + 8 + 2 = 31. Now we can find all the answers:

<table>
<tr><td>41.</td><td>3</td><td>Orders lost as a fraction of orders booked was maximum on 15th day which is equal to $\frac{12}{28}$.</td></tr>
<tr><td>42.</td><td>2</td><td>We can see that highest number of orders were booked on 13th day i.e 31.</td></tr>
<tr><td>43.</td><td>3</td><td>Delivery Ratio is highest for 14th day which is equal to 15 : 3 $\Rightarrow$ 5 : 1. Hence 3rd option.</td></tr>
<tr><td>44.</td><td>4</td><td>Average time taken as given in the question is least for 14th day which is equal to $\frac{15+2(3)}{15+3}=\frac{21}{18}$</td></tr>
<tr><td>45-50.</td><td colspan="2">
<table>
<tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>X</td><td>12
C</td><td></td><td></td><td></td></tr>
<tr><td>Y</td><td>21
A</td><td></td><td></td><td>A</td></tr>
<tr><td>Z</td><td>B</td><td>C</td><td>9</td><td>28</td></tr>
</table>
Given
Total number of trees = 205
A – C = 20 and D – A = 6 (from condition 1)
Let number of teak trees in column 2,3 and 4 is x, 2x and 4x respectively (from condition 3)
From condition 6 and 8, only possible plots for D is Row 1, column 3 and 4
From condition 7, plots for Bina are Row 1 column 2, Row 3 column 4 and Row 2 column 3. So Bina got 4</td></tr>
</table>

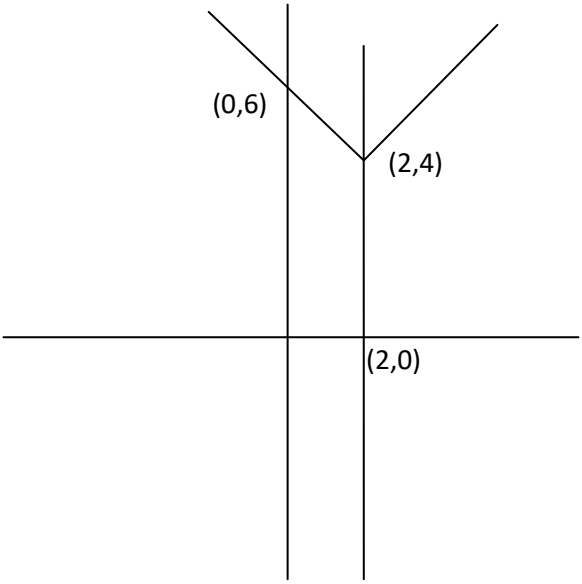
plots.
From condition 4 Abha and Dipti got 4 and 2 plots respectively.
(as each daughter got an even number of plots)
Using all conditions we get, number of plots as A = 4, B = 4, C = 2 and D = 2

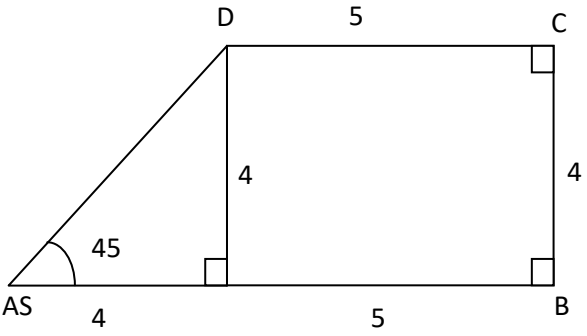
	1	2	3	4	
X	12 C	 B	 D	 D	M(2a)
Y	21 A	 A	 B	 A	T(a)
Z	 B	 C	9 A	28 B	P
		x	2x	4x	

Now as each plot had trees in non-zero multiples of 3 or 4 and none of the plots had the same number of trees.
So we cannot take x as 3 or 6.
If x = 4 then 2x = 8 and 4x = 16

	1	2	3	4	
X	12 C	 B	 D	 D	M(98)
Y	21 A	4 A	8 B	16 A	T(49)
Z	 B	 C	9 A	28 B	P
		x	2x	4x	

<table>
<tr><td></td><td colspan="2">So we have A = 50
From condition 1, C = 30 and D = 56 $\Rightarrow$ B = 69
So we have
<table>
<tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th></th></tr>
<tr><td>X</td><td>12
C</td><td>30
B</td><td>
D</td><td>
D</td><td>M(98)</td></tr>
<tr><td>Y</td><td>21
A</td><td>4
A</td><td>8
B</td><td>16
A</td><td>T(49)</td></tr>
<tr><td>Z</td><td>3
B</td><td>18
C</td><td>9
A</td><td>28
B</td><td>P</td></tr>
</table></td></tr>
<tr><td>45.</td><td>2</td><td>There are 98 mango trees in total</td></tr>
<tr><td>46.</td><td>2</td><td>50, 69, 30, 56 is the correct sequence of trees received by Abha, Bina, Chitra and Dipti.</td></tr>
<tr><td>47.</td><td>1</td><td>Chitra receives 18 pine trees.</td></tr>
<tr><td>48.</td><td>1</td><td>Bina got the plot with smallest number of trees i.e. 3.</td></tr>
<tr><td>49.</td><td>1</td><td>Statement 1 is wrong as Bina got 3 pine trees.</td></tr>
<tr><td>50.</td><td>2</td><td>Total trees in column 1 = 36
Total trees in column 2 = 52
As Dipti got 32 trees in one of her plots. We can see taking 32 trees in either column 3 or 4, number of trees in column 4 is always more than all other columns. So column 4 is the answer.</td></tr>
<tr><td>51.</td><td>2</td><td>Let initial volume of A and B be 1 lt and 3 lt. Now 4lt of A is added. Now A = 5 lt and B = 3lt. Let % of alcohol in B is p%. So according to the</td></tr>
</table>

		question: 8×72/100 = (5×60/100) + (3 × p/100) On solving this we get p= 92
52.	3	Time taken by Anil to complete one round = 3/15 Time taken by Sunil to complete one round = 3/10 Time taken by Anil and Sunil to meet at the starting point first time = 3/5 hrs Distance travelled by Ravi in 3/5 hrs = 8×3/5 = 4.8 kms
53.	1	The figure is a trapezium Area = ½ x (4 + 6) × 2 = 10 

54.	3	Distance covered by Train from point A till 10:30 = 40 × 1.5 = 60 km So remaining distance = 90 – 60 = 30 km Time = 30/(40+20) = ½ hrs So trains meet each other at 11:00 am
55.	1	Bishnu scored 52% and Asha scored 64%. Difference between their actual marks = 23 + 34 =57 Difference in their percentages = 12% So 12% of Total = 57 Total = 57×100/12 Score of Geeta = (57 × 100/12) × 84/100 = 399
56.	2	A+B = $\log_a 5 + \log_a 6 - \log_a 5 + \log_a 3 = \log_a 18$ $\log_a 2 = 3$ So $\log_a 18 = \log_a 2 + 2\log_a 3$ So A+B = $3 + 2\log_a 3$ $\log_a 3 = (A+B-3)/2$ So $\log_3 a = 2/(A+B-3)$
57.	28	Required Area = (5x4) + ½ x 4 x 4 = 28 

58.	4	$F(5 + 5) = F(5)^2 = 16$ similarly $F(-5) = 1/4$, So $F(-10) = 1/16$ So $16 - 1/16 = 15.9375$
59.	24	$(2x4x8x16)/ (4 \times 27/8 \times 256/81) = 24$
60.	6	$N=x + y$ Minimum of $x + y = 3 + 15 = 18$ Maximum value of $x + y = 9 + 22 = 31$ Now as $N > 25$, so all values from 26 to 31 are possible. 6 values are possible
61.	1	Let cost per kg = 1 Mark Price = 1.2/kg Total cost = 35 Total selling price = $35x\ 1.15 = 40.25$ $[(5x1.2)+ (15x\ 1.2 \times 0.9)+ (3\times 0) + (12\times1.2\times (1 + p/100))] = 40.25$ $p= 25$
62.	2	Let usual time taken is t $40 \times t = 35 \times (t + 6)$ So t = 42 mins Distance = $40 \times 42/60 = 28$kms So $28 \times 2/3 = 56/3$ kms are covered in 42/3 = 14 mins Vimla stops for 8 mins. Time left = 42 – 14 – 8 = 20 mins So 28/3 kms are to be covered in 20 mins. Speed = $(28/3)/(20/60) = 28$kmph

63.	252	Three digit numbers without repetition = 9 × 9 × 8 = 648 So three digit numbers with at least one digit repeated = 900 – 648 = 252
64.	2	Total score of (n+2) innings = 29x(n+2) = 29n + 58 Total score of n innings = 29n + 58 – 38 – 15 = 30n So n=5 So total score in 5 innings = 30 × 5 = 150 Maximum score in any inning = 37 So 150 – (37× 4) = 2
65.	4	K/4 = 1/K So K^2 = 4 |K| = 2
66.	18	Let age of Tom = x So age of Dick = 3x and Harry = 6x So (x + 3x + 6x)/3 - 3x = 1 x = 3 So Harry's age = 18
67.	3	Let coordinates of the circumcenter be (x, y) Now just equating the distance of this point from the vertices of the triangle. $x^2 + y^2 = (x – 4)^2 + y^2$ $x^2 + y^2 = (x – 3)^2 + (y – 9)^2$ On solving these two equations we get x=2 and y= 13/3 So $R^2 = (2^2 + (13/3)^2) = 205\pi/9$

68.	16000	$P(1+5/100)^3 = 18522$ $P = 16000$
69.	3	$14^a = 36^b = 84^c = K$ $14 = k^{1/a}$ $84 = k^{1/c}$ $36 = k^{1/b}$ $(84/14)^2 = 36$ $K^{(2/c - 2/a)} = K^{1/b}$ $2(1/c - 1/a) = 1/b$ $2b(1/c - 1/a) = 1$ So $6b(1/c - 1/a) = 3$
70.	1	The diagonals will intersect at the midpoint of the line joining (2,1) and (-3,-4). This point will be (-1/2 , -3/2). The line x+9y +c =0 will also pass through (-1/2 , -3/2) so -1/2 + 9x-3/2 + c = 0 c = 14
71.	4	As N is even and N/11 lies between 0.2 and 0.5, So N has to be 4. N/M is less than 0.5, So M has to be greater than 8 but has to be less than 10 as M/20 is also less than 0.5 So M = 9 M – 2N = 9 – 8= 1
72.	3	$X_1 = -1$, $X_2 = -3$, $X_3 = -6$, $X_4 = -10$ So you can observe the pattern $X_n = -n(n+1)/2$ $X_{100} = -100x101/2 = -5050$

73.	3	Numbers divisible by 2 = 120/2 = 60 Numbers divisible by 5 = 120/5 = 24 Numbers divisible by 7 = 120/7 = 17 Numbers divisible by 2 and 5 = 120/10 = 12 Numbers divisible by 5 and 7 = 120/35 = 3 Numbers divisible by 2 and 7 = 120/14 = 8 Numbers divisible by 2, 5 and 7 = 120/70 = 1 Numbers divisible by either 2, 5 or 7 = 60+24+17 – 12 – 3 – 8 + 1 = 79 Numbers divisible by none of 2, 5 or 7 = 120 – 79 = 41
74.	40	To complete 1.5 km, 140 persons took 60 days So to complete the remaining 4.5 km, 140 persons would have taken = 60×3 = 180 days Now to complete 180 days work in (200 – 60) = 140 days: Number of persons required = 140 × 180/140 = 180 Additional persons = 180 – 140 = 40
75.	3	Ax B = 4^{2017} A x B = 2^{4034} Now A and B are factors of 2^{4034} Total factors of the above number are 4035 So there are 4035 cases possible So there will be one case where A= B. (4035 – 1)/2 = 2017 cases will be there A>B, these cases are invalid. So 4035 – 2017 = 2018 cases

76.	4	$m^2 - 8n >= 0$ and $4n^2 - 4m >= 0$ Now the smallest value m can take for the first equation is m=3 and n =1, but this will not satisfy the second equation. If m= 4 then n= 2 So m + n = 6

Section - I: Verbal Ability

DIRECTIONS ***for questions 1 to 24:*** *Read the passage and answer the question based on it.*

Passage-I

Contemporary internet shopping conjures a perfect storm of choice anxiety. Research has consistently held that people who are presented with a few options make better, easier decisions than those presented with many Helping consumers figure out what to buy amid an endless sea of choice online has become a cottage industry unto itself. Many brands and retailers now wield marketing buzzwords such as curation, differentiation, and discovery as they attempt to sell an assortment of stuff targeted to their ideal customer. Companies find such shoppers through the data gold mine of digital advertising, which can catalog people by gender, income level, personal interests, and more. Since Americans have lost the ability to sort through the sheer volume of the consumer choices available to them, a ghost now has to be in the retail machine, whether it's an algorithm, an influencer, or some snazzy ad tech to help a product follow you around the internet. Indeed, choice fatigue is one reason so many people gravitate toward lifestyle influencers on Instagram—the relentlessly chic young

moms and perpetually vacationing 20-somethings—who present an aspirational worldview, and then recommend the products and services that help achieve it…

For a relatively new class of consumer-products start-ups, there's another method entirely. Instead of making sense of a sea of existing stuff, these companies claim to disrupt stuff as Americans know it. Casper (mattresses), Glossier (makeup), Away (suitcases), and many others have sprouted up to offer consumers freedom from choice: The companies have a few aesthetically pleasing and supposedly highly functional options, usually at mid-range prices. They're selling nice things, but maybe more importantly, they're selling a confidence in those things, and an ability to opt out of the stuff rat race….

One-thousand-dollar mattresses and $300 suitcases might solve choice anxiety for a certain tier of consumer, but the companies that sell them, along with those that attempt to massage the larger stuff economy into something navigable, are still just working within a consumer market that's broken in systemic ways. The presence of so much stuff in America might be more valuable if it were more evenly distributed, but stuff's creators tend to focus their energy on those who already

have plenty. As options have expanded for people with disposable income, the opportunity to buy even basic things such as fresh food or quality diapers has contracted for much of America's lower classes.

For start-ups that promise accessible simplicity, their very structure still might eventually push them toward overwhelming variety. Most of these companies are based on hundreds of millions of dollars of venture capital, the investors of which tend to expect a steep growth rate that can't be achieved by selling one great mattress or one great sneaker. Casper has expanded into bedroom furniture and bed linens. Glossier, after years of marketing itself as no-makeup makeup that requires little skill to apply, recently launched a full line of glittering color cosmetics. There may be no way to opt out of stuff by buying into the right thing.

1. Which one of the following best sums up the overall purpose of the examples of Casper and Glossier in the passage?

1. They are increasing the purchasing power of poor Americans.

2. They might transform into what they were exceptions to.

3. They are exceptions to a dominant trend in consumer markets.

4. They are facilitating a uniform distribution of commodities in the market.

2. All of the following, IF TRUE, would weaken the author's claims EXCEPT:

1. the empowerment felt by purchasers in buying a commodity were directly proportional to the number of options they could choose from.

2. the annual sales growth of companies with fewer product options were higher than that of companies which curated their products for target consumers.

3. the annual sale of companies that hired lifestyle influencers on Instagram for marketing their products were 40% less than those that did not.

4. product options increased market competition, bringing down the prices of commodities, which, in turn, increased purchasing power of the poor.

3. A new food brand plans to launch a series of products in the American market. Which of the following product plans is most likely to be supported by the author of the passage?

1. A range of 10 products priced between $10 and $25.

2. A range of 10 products priced between $5 and $10.

3. A range of 25 products priced between $10 and $25.

4. A range of 25 products priced between $5 and $10.

4. Which of the following hypothetical statements would add the least depth to the author's prediction of the fate of start-ups offering few product options?

1. Start-ups with few product options are no exception to the American consumer market that is deeply divided along class lines.

2. With the motive of promoting certain rival companies, the government decides to double the tax-rates for these start-ups.

3. An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their product catalogue.

4. With Casper and Glossier venturing into new product ranges, their regular customers start losing trust in the companies and their products.

5. Based on the passage, all of the following can be inferred about consumer behaviour EXCEPT that:

1. too many options have made it difficult for consumers to trust products.

2. consumers tend to prefer products by start-ups over those by established companies.

3. consumers are susceptible to marketing images that they see on social media.

4. having too many product options can be overwhelming for consumers.

Passage-II

Scientists recently discovered that Emperor Penguins—one of Antarctica's most celebrated species—employ a particularly unusual technique for surviving the daily chill. As detailed in an article published today in the journal Biology Letters, the birds minimize heat loss by

keeping the outer surface of their plumage below the temperature of the surrounding air. At the same time, the penguins' thick plumage insulates their body and keeps it toasty. . . .

The researchers analyzed thermo graphic images taken over roughly a month during June 2008. During that period, the average air temperature was 0.32 degrees Fahrenheit. At the same time, the majority of the plumage covering the penguins' bodies was even colder: the surface of their warmest body part, their feet, was an average 1.76 degrees Fahrenheit, but the plumage on their heads, chests and backs were -1.84, -7.24 and -9.76 degrees Fahrenheit respectively. Overall, nearly the entire outer surface of the penguins' bodies was below freezing at all times, except for their eyes and beaks. The scientists also used a computer simulation to determine how much heat was lost or gained from each part of the body—and discovered that by keeping their outer surface below air temperature, the birds might paradoxically be able to draw very slight amounts of heat from the air around them. The key to their trick is the difference between two different types of heat transfer: radiation and convection.

The penguins do lose internal body heat to the surrounding air through thermal radiation, just as our bodies do on a cold day. Because their bodies (but not surface plumage) are warmer than the surrounding air, heat gradually radiates outward over time, moving from a warmer material to a colder one. To maintain body temperature while losing heat, penguins, like all warm-blooded animals, rely on the metabolism of food. The penguins, though, have an additional strategy. Since their outer plumage is even colder than the air, the simulation showed that they might gain back a little of this heat through thermal convection—the transfer of heat via the movement of a fluid (in this case, the air). As the cold Antarctic air cycles around their bodies, slightly warmer air comes into contact with the plumage and donates minute amounts of heat back to the penguins, then cycles away at a slightly colder temperature.

Most of this heat, the researchers note, probably doesn't make it all the way through the plumage and back to the penguins' bodies, but it could make a slight difference. At the very least, the method by which a penguin's plumage wicks heat from the bitterly cold air that surrounds it helps to cancel out some of the heat that's radiating from its interior. And given the Emperors' unusually

demanding breeding cycle, every bit of warmth counts. Since [penguins trek as far as 75 miles to the coast to breed and male penguins] don't eat anything during [the incubation period of 64 days], conserving calories by giving up as little heat as possible is absolutely crucial.

6. All of the following, if true, would negate the findings of the study reported in the passage EXCEPT:

1. the average temperature of the feet of penguins in the month of June 2008 were found to be 2.76 degrees Fahrenheit.

2. the penguins' plumage were made of a material that did not allow any heat transfer through convection or radiation.

3. the temperature of the plumage on the penguins' heads, chests and backs were found to be 1.84, 7.24 and 9.76 degrees Fahrenheit respectively.

4. the average air temperature recorded during the month of June 2008 in the area of study were –10 degrees Fahrenheit.

7. Which of the following can be responsible for Emperor Penguins losing body heat?

1. Plumage.

2. Reproduction process.

3. Food metabolism.

4. Thermal convection

8. Which of the following best explains the purpose of the word “paradoxically” as used by the author?

1. Keeping a part of their body colder helps penguins keep their bodies warmer.

2. Heat loss through radiation happens despite the heat gain through convection.

3. Heat gain through radiation happens despite the heat loss through convection.

4. Keeping their body colder helps penguins keep their plumage warmer.

9. In the last sentence of paragraph 3, “slightly warmer air” and “at a slightly colder temperature” refer to AND respectively:

1. the cold Antarctic air which becomes warmer because of the heat radiated out from penguins’

bodies AND the fall in temperature of the surrounding air after thermal convection.

2. the cold Antarctic air whose temperature is higher than that of the plumage AND the fall in temperature of the Antarctic air after it has transmitted some heat to the plumage.

3. the air trapped in the plumage which is warmer than the Antarctic air AND the fall in temperature of the trapped plumage air after it radiates out some heat.

4. the air inside penguins' bodies kept warm because of metabolism of food AND the fall in temperature of the body air after it transfers some heat to the plumage.

Passage-III

"Free of the taint of manufacture" – that phrase, in particular, is heavily loaded with the ideology of what the Victorian socialist William Morris called the "anti-scrape", or an anti- capitalist conservationism (not conservatism) that solaced itself with the vision of a pre- industrial golden age. In Britain, folk may often appear a cosy, fossilised form, but when you look more closely, the idea of folk – who has the right to sing it, dance it, invoke it,

collect it, belong to it or appropriate it for political or cultural ends – has always been contested territory.

In our own time, though, the word "folk"…. has achieved the rare distinction of occupying fashionable and unfashionable status simultaneously. Just as the effusive floral prints of the radical William Morris now cover genteel sofas, so the revolutionary intentions of many folk historians and revivalists have led to music that is commonly regarded as parochial and conservative. And yet – as newspaper columns periodically rejoice – folk is hip again, influencing artists, clothing and furniture designers, celebrated at music festivals, awards ceremonies and on TV, reissued on countless record labels. Folk is a sonic "shabby chic", containing elements of the uncanny and eerie, as well as an antique veneer, a whiff of Britain's heathen dark ages. The very obscurity and anonymity of folk music's origins open up space for rampant imaginative fancies. . . .

[Cecil Sharp, who wrote about this subject, believed that] folk songs existed in constant transformation, a living example of an art form in a perpetual state of renewal. "One man sings a song, and then others sing it after him, changing what they do not like" is the most concise summary of his conclusions on its origins. He compared

each rendition of a ballad to an acorn falling from an oak tree; every subsequent iteration sows the song anew. But there is tension in newness. In the late 1960s, purists were suspicious of folk songs recast in rock idioms. Electrification, however, comes in many forms. For the early-20th-century composers such as Vaughan Williams and Holst, there were thunderbolts of inspiration from oriental mysticism, angular modernism and the body blow of the first world war, as well as input from the rediscovered folk tradition itself.

For the second wave of folk revivalists, such as Ewan MacColl and AL Lloyd, starting in the 40s, the vital spark was communism's dream of a post-revolutionary New Jerusalem. For their younger successors in the 60s, who thronged the folk clubs set up by the old guard, the lyrical freedom of Dylan and the unchained melodies of psychedelia created the conditions for folk- rock's own golden age, a brief Indian summer that lasted from about 1969 to 1971. Four decades on, even that progressive period has become just one more era ripe for fashionable emulation and pastiche. The idea of a folk tradition being exclusively confined to oral transmission has become a much looser, less severely guarded concept. Recorded

music and television, for today's metropolitan generation, are where the equivalent of folk memories are seeded….

10. The primary purpose of the reference to William Morris and his floral prints is to show:

1. the pervasive influence of folk on contemporary art, culture, and fashion.

2. that despite its archaic origins, folk continues to remain a popular tradition.

3. that what was once derided as genteel is now considered revolutionary.

4. that what is once regarded as radical in folk, can later be seen as conformist

11. Which of the following statements about folk revivalism of the 1940s and 1960s cannot be inferred from the passage?

1. Even though it led to folk-rock's golden age, it wasn't entirely free from critique.

2. It reinforced Cecil Sharp's observation about folk's constant transformation.

3. Freedom and rebellion were popular themes during the second wave of folk revivalism.

4. Electrification of music would not have happened without the influence of rock music.

12. The author says that folk "may often appear a cosy, fossilised form" because:

1. it has been arrogated for various political and cultural purposes.

2. of its nostalgic association with a pre-industrial past.

3. folk is a sonic "shabby chic" with an antique veneer.

4. the notion of folk has led to several debates and disagreements.

13. All of the following are causes for plurality and diversity within the British folk tradition EXCEPT:

1. paradoxically, folk forms are both popular and unpopular.

2. that British folk forms can be traced to the remote past of the country.

3. the fluidity of folk forms owing to their history of oral mode of transmission.

4. that British folk continues to have traces of pagan influence from the dark ages.

14. At a conference on folk forms, the author of the passage is least likely to agree with which one of the following views?

1. The plurality and democratising impulse of folk forms emanate from the improvisation that its practitioners bring to it.

2. Folk forms, in their ability to constantly adapt to the changing world, exhibit an unusual poise and homogeneity with each change.

3. The power of folk resides in its contradictory ability to influence and be influenced by the present while remaining rooted in the past.

4. Folk forms, despite their archaic origins, remain intellectually relevant in contemporary times.

Passage-IV

As defined by the geographer Yi-Fu Tuan, topophilia is the affective bond between people and place. His 1974 book set forth a wide-ranging exploration of how the emotive ties with the material environment vary greatly from person to person and in intensity, subtlety, and

mode of expression. Factors influencing one's depth of response to the environment include cultural background, gender, race, and historical circumstance, and Tuan also argued that there is a biological and sensory element. Topophilia might not be the strongest of human emotions— indeed, many people feel utterly indifferent toward the environments that shape their lives— but when activated it has the power to elevate a place to become the carrier of emotionally charged events or to be perceived as a symbol.

Aesthetic appreciation is one way in which people respond to the environment. A brilliantly colored rainbow after gloomy afternoon showers, a busy city street alive with human interaction—one might experience the beauty of such landscapes that had seemed quite ordinary only moments before or that are being newly discovered. This is quite the opposite of a second topophilic bond, namely that of the acquired taste for certain landscapes and places that one knows well. When a place is home, or when a space has become the locus of memories or the means of gaining a livelihood, it frequently evokes a deeper set of attachments than those predicated purely on the visual. A third response to the environment also depends on the human senses but

may be tactile and olfactory, namely a delight in the feel and smell of air, water, and the earth.

Topophilia—and its very close conceptual twin, sense of place—is an experience that, however elusive, has inspired recent architects and planners. Most notably, new urbanism seeks to counter the perceived placelessness of modern suburbs and the decline of central cities through neo-traditional design motifs. Although motivated by good intentions, such attempts to create places rich in meaning are perhaps bound to disappoint. As Tuan noted, purely aesthetic responses often are suddenly revealed, but their intensity rarely is long- lasting. Topophilia is difficult to design for and impossible to quantify, and its most articulate interpreters have been self-reflective philosophers such as Henry David Thoreau, evoking a marvelously intricate sense of place at Walden Pond, and Tuan, describing his deep affinity for the desert.

Topophilia connotes a positive relationship, but it often is useful to explore the darker affiliations between people and place. Patriotism, literally meaning the love of one's terra patria or homeland, has long been cultivated by governing elites for a range of nationalist projects, including war preparation and ethnic cleansing.

Residents of upscale residential developments have disclosed how important it is to maintain their community's distinct identity, often by casting themselves in a superior social position and by reinforcing class and racial differences. And just as a beloved landscape is suddenly revealed, so too may landscapes of fear cast a dark shadow over a place that makes one feel a sense of dread or anxiety—or topophobia.

15. Which one of the following comes closest in meaning to the author's understanding of topophilia?

1. The tendency of many cultures to represent their land as "motherland" or "fatherland" may be seen as an expression of their topophilia

2. Scientists have found that most creatures, including humans, are either born with or cultivate a strong sense of topography.

3. The French are not overly patriotic, but they will refuse to use English as far as possible, even when they know it well.

4. Nomadic societies are known to have the least affinity for the lands through which they traverse because they tend to be topophobic.

16. The word "topophobia" in the passage is used:

1. to signify feelings of fear or anxiety towards topophilic people.

2. as a metaphor expressing the failure of the homeland to accommodate non-citizens.

3. to represent a feeling of dread towards particular spaces and places.

4. to signify the fear of studying the complex discipline of topography.

17. Which one of the following best captures the meaning of the statement, "Topophilia is difficult to design for and impossible to quantify . . ."?

1. The deep anomie of modern urbanisation led to new urbanism's intricate sense of place.

2. Philosopher-architects are uniquely suited to develop topophilic design.

3. People's responses to their environment are usually subjective and so cannot be rendered in design.

4. Architects have to objectively quantify spaces and hence cannot be topophilic.

18. In the last paragraph, the author uses the example of "Residents of upscale residential developments" to illustrate the:

1. sensitive response to race and class problems in upscale residential developments.

2. manner in which environments are designed to minimise the social exclusion of their clientele.

3. introduction of nationalist projects by such elites to produce a sense of dread or topophobia.

4. social exclusivism practised by such residents in order to enforce a sense of racial or class superiority.

19. Which of the following statements, if true, could be seen as not contradicting the arguments in the passage?

1. Generally speaking, in a given culture, the ties of the people to their environment vary little in significance or intensity.

2. New Urbanism succeeded in those designs where architects collaborated with their clients.

3. The most important, even fundamental, response to our environment is our tactile and olfactory response.

4. Patriotism, usually seen as a positive feeling, is presented by the author as a darker form of topophilia.

Passage - V

In the past, credit for telling the tale of Aladdin has often gone to Antoine Galland . . . the first European translator of . . . Arabian Nights [which] started as a series of translations of an incomplete manuscript of a medieval Arabic story collection. . . But, though those tales were of medieval origin, Aladdin may be a more recent invention. Scholars have not found a manuscript of the story that predates the version published in 1712 by Galland, who wrote in his diary that he first heard the tale from a Syrian storyteller from Aleppo named Hanna Diyab…

Despite the fantastical elements of the story, scholars now think the main character may actually be based on a real person's real experiences. Though Galland never credited Diyab in his published translations of the Arabian Nights stories, Diyab wrote something of his own: a travelogue penned in the mid-18th century. In it,

he recalls telling Galland the story of Aladdin [and] describes his own hard-knocks upbringing and the way he marveled at the extravagance of Versailles. The descriptions he uses were very similar to the descriptions of the lavish palace that ended up in Galland's version of the Aladdin story. [Therefore, author Paulo Lemos] Horta believes that "Aladdin might be the young Arab Maronite from Aleppo, marveling at the jewels and riches of Versailles."....

For 300 years, scholars thought that the rags-to-riches story of Aladdin might have been inspired by the plots of French fairy tales that came out around the same time, or that the story was invented in that 18th century period as a byproduct of French Orientalism, a fascination with stereotypical exotic Middle Eastern luxuries that was prevalent then. The idea that Diyab might have based it on his own life — the experiences of a Middle Eastern man encountering the French, not vice-versa — flips the script. [According to Horta,] "Diyab was ideally placed to embody the overlapping world of East and West, blending the storytelling traditions of his homeland with his youthful observations of the wonder of 18th-century France."....

To the scholars who study the tale, its narrative drama isn't the only reason storytellers keep finding reason to return to Aladdin. It reflects not only "a history of the French and the Middle East, but also [a story about] Middle Easterners coming to Paris and that speaks to our world today," as Horta puts it. "The day Diyab told the story of Aladdin to Galland, there were riots due to food shortages during the winter and spring of 1708 to 1709, and Diyab was sensitive to those people in a way that Galland is not. When you read this diary, you see this solidarity among the Arabs who were in Paris at the time. There is little in the writings of Galland

that would suggest that he was capable of developing a character like Aladdin with sympathy, but Diyab's memoir reveals a narrator adept at capturing the distinctive psychology of a young protagonist, as well as recognizing the kinds of injustices and opportunities that can transform the path of any youthful adventurer."

20. Which of the following, if true, would invalidate the inversion that the phrase "flips the script" refers to?

1. Galland acknowledged in the published translations of Arabian Nights that he heard the story of Aladdin from Diyab.

2. The French fairy tales of the eighteenth century did not have rags-to-riches plot lines like that of the tale of Aladdin.

3. The description of opulence in Hanna Diyab's and Antoine Galland's narratives bore no resemblance to each other.

4. Diyab's travelogue described the affluence of the French city of Bordeaux, instead of Versailles.

21. The author of the passage is most likely to agree with which of the following explanations for the origins of the story of Aladdin?

1. Basing it on his own life experiences, Diyab transmitted the story of Aladdin to Galland who included it in Arabian Nights.

2. Galland received the story of Aladdin from Diyab who, in turn, found it in an incomplete medieval manuscript.

3. Galland derived the story of Aladdin from Diyab's travelogue in which he recounts his fascination with the wealth of Versailles.

4. The story of Aladdin has its origins in an undiscovered, incomplete manuscript of a medieval Arabic collection of stories.

22. All of the following serve as evidence for the character of Aladdin being based on Hanna Diyab EXCEPT:

1. Diyab's narration of the original story to Galland.

2. Diyab's cosmopolitanism and cross-cultural experience.

3. Diyab's description of the wealth of Versailles in his travelogue.

4. Diyab's humble origins and class struggles, as recounted in his travelogue.

23. Which of the following is the primary reason for why storytellers are still fascinated by the story of Aladdin?

1. The story of Aladdin is evidence of the eighteenth century French Orientalist attitude.

2. The tale of Aladdin documents the history of Europe and Middle East.

3. The traveller's experience that inspired the tale of Aladdin resonates even today.

4. The archetype of the rags-to-riches story of Aladdin makes it popular even today

24. Which of the following does not contribute to the passage's claim about the authorship of Aladdin?

1. The story-line of many French fairy tales of the 18th century.

2. The narrative sensibility of Diyab's travelogue.

3. The depiction of the affluence of Versailles in Diyab's travelogue.

4. Galland's acknowledgment of Diyab in his diary.

DIRECTION *for the question 25:* *Five sentences related to a topic are given below in a jumbled order. Four of them form a coherent and unified paragraph. Identify the odd sentence that does not go with the four. Key in the number of the option that you choose.*

25. 1. 'Stat' signaled something measurable, while 'matic' advertised free labour; but 'tron', above all, indicated control.

2. It was a totem of high modernism, the intellectual and cultural mode that decreed no process or phenomenon was too complex to be grasped, managed and optimized.

3. Like the heraldic shields of ancient knights, these morphemes were painted onto the names of scientific technologies to proclaim one's history and achievements to friends and enemies alike.

4. The historian Robert Proctor at Stanford University calls the suffix '-tron', along with '-matic' and '-stat', embodied symbols.

5. To gain the suffix was to acquire a proud and optimistic emblem of the electronic and atomic age.

DIRECTIONS ***for questions 26 & 27:*** *The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.*

26. 1. People with dyslexia have difficulty with print-reading, and people with autism spectrum disorder have difficulty with mind-reading.

2. An example of a lost cognitive instinct is mind-reading: our capacity to think of ourselves and others as having beliefs, desires, thoughts and feelings.

3. Mind-reading looks increasingly like literacy, a skill we know for sure is not in our genes, since scripts have been around for only 5,000-6,000 years.

4. Print-reading, like mind-reading varies across cultures, depends heavily on certain parts of the brain, and is subject to developmental disorders.

27. 1. Metaphors may map to similar meanings across languages, but their subtle differences can have a profound effect on our understanding of the world.

2. Latin scholars point out carpe diem is a horticultural metaphor that, particularly seen in the context of its source, is more accurately translated as “plucking the day,” evoking the plucking and gathering of ripening fruits or flowers, enjoying a moment that is rooted in the sensory experience of nature, unrelated to the force implied in seizing.

3. The phrase carpe diem, which is often translated as “seize the day and its accompanying philosophy, has gone on to inspire countless people in how they live their lives and motivates us to see the world a little differently from the norm

4. It's an example of one of the more telling ways that we mistranslate metaphors from one language to another, revealing in the process our hidden assumptions about what we really value.

DIRECTIONS ***for questions 28 to 30:*** *The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage*

28. Vance Packard's The Hidden Persuaders alerted the public to the psychoanalytical techniques used by the advertising industry. Its premise was that advertising agencies were using depth interviews to identify hidden consumer motivations, which were then used to entice consumers to buy goods. Critics and reporters often wrongly assumed that Packard was writing mainly about subliminal advertising. Packard never mentioned the word subliminal, however, and devoted very little space to discussions of "subthreshold" effects. Instead, his views largely aligned with the notion that individuals do not always have access to their conscious thoughts and can be persuaded by supraliminal messages without their knowledge.

1. Packard argued that advertising as a 'hidden persuasion' understands the hiddenmotivations of

consumers and works at the subliminal level, on the subconscious level of the awareness of the people targeted.

2. Packard held that advertising as a 'hidden persuasion' understands the hidden motivations of consumers and works at the supraliminal level, though the people targeted have no awareness of being persuaded.

3. Packard argued that advertising as a 'hidden persuasion' works at the supraliminal level, wherein the people targeted are aware of being persuaded, after understanding the hidden motivations of consumers and works.

4. Packard held that advertising as a 'hidden persuasion' builds on peoples' conscious thoughts and awareness, by understanding the hidden motivations of consumers and works at the subliminal level

29. A distinguishing feature of language is our ability to refer to absent things, known as displaced reference. A speaker can bring distant referents to mind in the absence of any obvious stimuli. Thoughts, not limited to the here and now, can pop

into our heads for unfathomable reasons. This ability to think about distant things necessarily precedes the ability to talk about them. Thought precedes meaningful referential communication. A prerequisite for the emergence of human-like meaningful symbols is that the mental categories they relate to can be invoked even in the absence of immediate stimuli.

1. Thoughts precede all speech acts and these thoughts pop up in our heads even in the absence of any stimulus.

2. The ability to think about objects not present in our environment precedes the development of human communication.

3. Thoughts are essential to communication and only humans have the ability to think about objects not present in their surroundings.

4. Displaced reference is particular to humans and thoughts pop into our heads for no real reason

30. Physics is a pure science that seeks to understand the behavior of matter without regard to whether it will afford any practical benefit. Engineering is the correlative applied science in which physical

theories are put to some specific use, such as building a bridge or a nuclear reactor. Engineers obviously rely heavily on the discoveries of physicists, but an engineer's knowledge of the world is not the same as the physicist's knowledge. In fact, an engineer's know-how will often depend on physical theories that, from the point of view of pure physics, are false. There are some reasons for this. First, theories that are false in the purest and strictest sense are still sometimes very good approximations to the true ones, and often have the added virtue of being much easier to work with. Second, sometimes the true theories apply only under highly idealized conditions which can only be created under controlled experimental situations. The engineer finds that in the real world, theories rejected by physicists yield more accurate predictions than the ones that they accept.

1. Though engineering draws heavily from pure science, it contributes to knowledge, by incorporating the constraints and conditions in the real world.

2. Engineering and physics fundamentally differ on matters like building a bridge or a nuclear reactor.

3. The relationship between pure and applied science is strictly linear, with the pure science directing applied science, and never the other way round.

4. The unique task of the engineer is to identify, understand, and interpret the design constraints to produce a successful result.

DIRECTIONS ***for questions 31 & 32:*** *The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.*

31. 1. If you've seen a little line of text on websites that says something like "customers who bought this also enjoyed that" you have experienced this collaborative filtering firsthand.

2. The problem with these algorithms is that they don't take into account a host of nuances and circumstances that might interfere with their accuracy.

3. If you just bought a gardening book for your cousin, you might get a flurry of links to books about gardening, recommended just for you! – the

algorithm has no way of knowing you hate gardening and only bought the book as a gift.

4. Collaborative filtering is a mathematical algorithm by which correlations and co-occurrences of behaviors are tracked and then used to make recommendations.

32. 1. We'll all live under mob rule until then, which doesn't help anyone.

2. Perhaps we need to learn to condense the feedback we receive online so that 100 replies carry the same weight as just one.

3. As we grow more comfortable with social media conversations being part of the way we interact every day, we are going to have to learn how to deal with legitimate criticism.

4. A new norm will arise where it is considered unacceptable to reply with the same point that dozens of others have already.

DIRECTIONS ***for questions 33 & 34:*** *Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.*

33. 1. His idea to use sign language was not a completely new idea as Native Americans used hand gestures to communicate with other tribes.

2. Ancient Greek philosopher Aristotle, for example, observed that men who are deaf are incapable of speech.

3. People who were born deaf were denied the right to sign a will as they were "presumed to understand nothing; because it is not possible that they have been able to learn to read or write."

4. Pushback against this prejudice began in the 16th century when Pedro Ponce de León created a formal sign language for the hearing impaired.

5. For millennia, people with hearing impairments encountered marginalization because it was believed that language could only be learned by hearing the spoken word.

34. 1. One argument is that actors that do not fit within a single, well-defined category may suffer an "illegitimacy discount".

2. Others believe that complex identities confuse audiences about an organization's role or purpose.

3. Some organizations have complex and multidimensional identities that span or combine categories, while other organizations possess narrow identities.

4. Identity is one of the most important features of organizations, but there exist opposing views among sociologists about how identity affects organizational performance.

5. Those who think that complex identities are beneficial point to the strategic advantages of ambiguity, and organizations' potential to differentiate themselves from competitors.

Section - II: DI & LR

DIRECTIONS ***for questions 35 to 38****: Study the following table given below and answer the question that follows.*

The following table represents addition of two six-digit numbers given in the first and the second rows, while the sum is given in the third row. In the representation, each of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 has been coded with one letter among A, B, C, D, E, F, G, H, J, K, with distinct letters representing distinct digits.

		B	**H**	**A**	**A**	**G**	**F**
+		A	H	J	F	K	F
	A	A	F	G	C	A	F

35. Which digit does the letter A represent?

36. Which digit does the letter B represent?

37. Which among the digits 3, 4, 6 and 7 cannot be represented by the letter D?

38. Which among the digits 4, 6, 7 and 8 cannot be represented by the letter G?

DIRECTIONS ***for questions 39 to 42:*** *Read the information given below and answer the question that follows.*

Princess, Queen, Rani and Samragni were the four finalists in a dance competition. Ashman, Badal, Gagan and Dyu were the four music composers who individually assigned items to the dancers. Each dancer had to individually perform in two dance items assigned by the different composers. The first items performed by the four dancers were all assigned by different music composers. No dancer performed her second item before the performance of the first item by any other dancers. The dancers performed their second items in the same sequence of their performance of their first items.

The following additional facts are known.

i) No composer who assigned item to Princess, assigned any item to Queen.

ii) No composer who assigned item to Rani, assigned any item to Samragni.

iii) The first performance was by Princess; this item was assigned by Badal.

iv) The last performance was by Rani; this item was assigned by Gagan.

v) The items assigned by Ashman were performed consecutively. The number of performances between items assigned by each of the remaining composers was the same.

39. Which of the following is true?

1. The third performance was composed by Ashman.

2. The second performance was composed by Dyu.

3. The second performance was composed by Gagan.

4. The third performance was composed by Dyu.

40. Which of the following is FALSE?

1. Queen did not perform in any item composed by Gagan.

2. Samragni did not perform in any item composed by Ashman.

3. Rani did not perform in any item composed by Badal.

4. Princess did not perform in any item composed by Dyu.

41. The sixth performance was composed by:

1. Gagan 2. Badal 3. Ashman 4. Dyu

42. Which pair of performances were composed by the same composer?

1. The third and the seventh
2. The first and the seventh
3. The first and the sixth
4. The second and the sixth

DIRECTIONS ***for questions 43 to 46:*** *Read the information given below and answer the question that follows.*

A new game show on TV has 100 boxes numbered 1, 2, . . . , 100 in a row, each containing a mystery prize. The prizes are items of different types, a, b, c, . . . , in decreasing order of value. The most expensive item is of type a, a diamond ring, and there is exactly one of these. You are told that the number of items at least doubles as you move to the next type. For example, there would be at least twice as many items of type b as of type a, at least twice as many items of type c as of type b and so on. There is no particular order in which the prizes are placed in the boxes.

43. What is the minimum possible number of different types of prizes?

44. What is the maximum possible number of different types of prizes?

45. Which of the following is not possible?

1. There are exactly 60 items of type d.
2. There are exactly 30 items of type b.
3. There are exactly 45 items of type c.
4. There are exactly 75 items of type e.

46. You ask for the type of item in box 45. Instead of being given a direct answer, you are told that there are 31 items of the same type as box 45 in boxes 1 to 44 and 43 items of the same type as box 45 in boxes 46 to 100.

What is the maximum possible number of different types of items?

1. 6 2. 4 3. 3 4. 5

DIRECTIONS ***for questions 47 to 50:*** *Read the information given below and answer the question that follows.*

A supermarket has to place 12 items (coded A to L) in shelves numbered 1 to 16. Five of these items are types of biscuits, three are types of candies and the rest are types of savouries. Only one item can be kept in a shelf. Items are to be placed such that all items of same type are clustered together with no empty shelf between items of the same type and at least one empty shelf between two different types of items. At most two empty shelves can have consecutive numbers.

The following additional facts are known.

1. A and B are to be placed in consecutively numbered shelves in increasing order.

2. I and J are to be placed in consecutively numbered shelves both higher numbered than the shelves in which A and B are kept.

3. D, E and F are savouries and are to be placed in consecutively numbered shelves in increasing order after all the biscuits and candies.

4. K is to be placed in shelf number 16.

5. L and J are items of the same type, while H is an item of a different type.

6. C is a candy and is to be placed in a shelf preceded by two empty shelves.

7. L is to be placed in a shelf preceded by exactly one empty shelf.

47. In how many different ways can the items be arranged on the shelves?

1. 4 2. 1 3. 2 4. 8

48. Which of the following items is not a type of biscuit?

1. B 2. A 3. L 4. G

49. Which of the following can represent the numbers of the empty shelves in a possible arrangement?

1. 1,7,11,12 2. 1,2,8,12

3. 1,2,6,12 4. 1,5,6,12

50. Which of the following statements is necessarily true?

1. There are at least four shelves between items B and C.

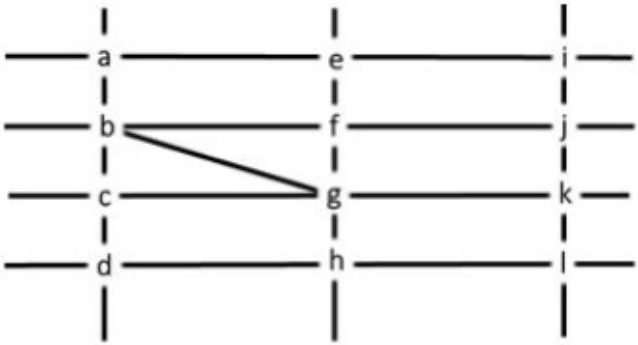
2. There are two empty shelves between the biscuits and the candies.

3. All candies are kept before biscuits.

4. All biscuits are kept before candies.

DIRECTIONS ***for questions 51 to 54****: Read the information given below and answer the question that follows.*

The figure below shows the street map for a certain region with the street intersections marked from a through I. A person standing at an intersection can see along straight lines to other intersections that are in her line of sight and all other people standing at these intersections. For example, a person standing at intersection g can see all people standing at intersections b, c, e, f, h, and k. In particular, the person standing at intersection g can see the person standing at intersection e irrespective of whether there is a person standing at intersection f.



Six people U, V, W, X, Y, and Z, are standing at different intersections. No two people are standing at the same intersection.

The following additional facts are known.

1. X, U, and Z are standing at the three corners of a triangle formed by three street segments.

2. X can see only U and Z.

3. Y can see only U and W.

4. U sees V standing in the next intersection behind Z.

5. W cannot see V or Z.

6. No one among the six is standing at intersection d.

51. Who is standing at intersection a?

1. No one 2. Y 3. V 4. W

52. Who can V see?

1. U, W and Z only
2. Z only
3. U and Z only
4. U only

53. What is the minimum number of street segments that X must cross to reach Y?

1. 1 2. 4 3. 3 4. 2

54. Should a new person stand at intersection d, who among the six would she see?

1. U and Z only
2. V and X only
3. W and X only
4. U and W only

DIRECTIONS ***for questions 55 to 58****: Read the information given below and answer the question that follows.*

Six players – Tanzi, Umeza, Wangdu, Xyla, Yonita and Zeneca competed in an archery tournament. The tournament had three compulsory rounds, Rounds 1 to 3. In each round every player shot an arrow at a target. Hitting the centre of the target (called bull's eye) fetched the highest score of 5. The only other possible scores that a player could achieve were 4, 3, 2 and 1. Every bull's

eye score in the first three rounds gave a player one additional chance to shoot in the bonus rounds, Rounds 4 to 6. The possible scores in Rounds 4 to 6 were identical to the first three.

A player's total score in the tournament was the sum of his/her scores in all rounds played by him/her. The table below presents partial information on points scored by the players after completion of the tournament. In the table, NP means that the player did not participate in that round, while a hyphen means that the player participated in that round and the score information is missing.

	Round-1	Round-2	Round-3	Round-4	Round-5	Round-6
Tanzi	-	4	-	5	NP	NP
Umeza	-	-	-	1	2	NP
Wangdu	-	4	-	NP	NP	NP
Xyla	-	-	-	1	5	-
Yonita	-	-	3	5	NP	NP
Zeneca	-	-	-	5	5	NP

The following facts are also known.

1. Tanzi, Umeza and Yonita had the same total score.

2. Total scores for all players, except one, were in multiples of three.

3. The highest total score was one more than double of the lowest total score.

4. The number of players hitting bull's eye in Round 2 was double of that in Round 3.

5.Tanzi andZeneca had the same score in Round 1 but different scores in Round 3.

55. What was the highest total score?

1. 25 2. 21 3. 24 4. 23

56. What was Zeneca's total score?

1. 21 2. 22 3. 23 4. 24

57. Which of the following statements is true?

1. Xyla's score was 23.
2. Xyla was the highest scorer.
3. Zeneca was the highest scorer.
4. Zeneca's score was 23

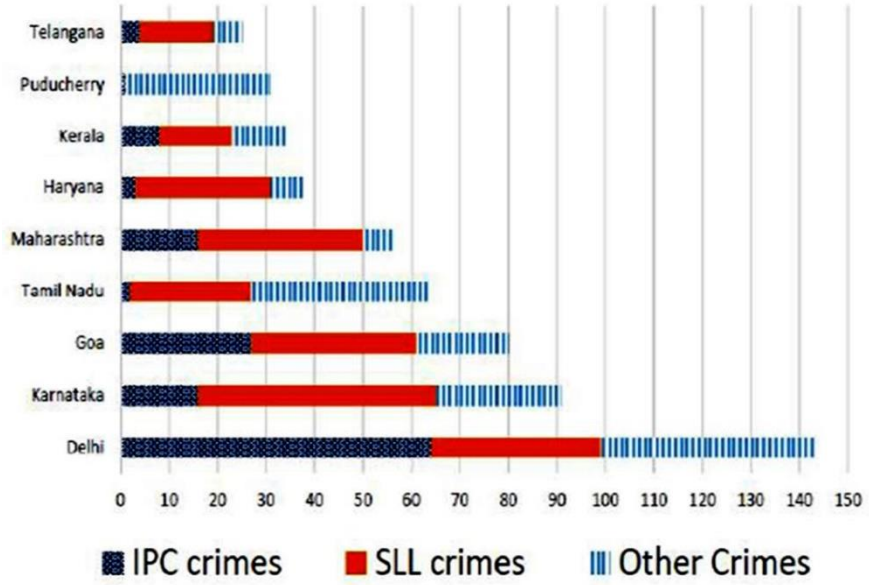
58. What was Tanzi's score in Round 3?

1. 5 2. 4 3. 1 4. 3

DIRECTIONS *for questionss 59 to 62:* *Study the following Graph & table given below and answer the question that follows.*

The Ministry of Home Affairs is analysing crimes committed by foreigners in different states and union territories (UT) of India. All cases refer to the ones registered against foreigners in 2016.

The number of cases – classified into three categories: IPC crimes, SLL crimes and other crimes – for nine states/UTs are shown in the figure below. These nine belong to the top ten states/UTs in terms of the total number of cases registered. The remaining state (among top ten) is West Bengal, where all the 520 cases registered were SLL crimes.



The table below shows the ranks of the ten states/UTs mentioned above among ALL states/UTs of India in terms of the number of cases registered in each of the three category of crimes. A state/UT is given rank r for a category of crimes if there are (r-1) states/UTs having a larger number of cases registered in that category of crimes. For example, if two states have the same number of cases in a category, and exactly three other states/UTs have larger numbers of cases registered in the same category, then both the states are given rank 4 in that category. Missing ranks in the table are denoted by *.

	IPC Crimes	SLL Crimes	Other Crimes
Delhi	*	*	*
Goa	*	4	*
Haryana	8	6	*
Karnataka	3	2	*
Kerala	*	9	*
Maharashtra	3	4	8
Puducherry	13	29	*
Tamil Nadu	11	7	*
Telangana	6	9	8
West Bengal	17	*	16

59. What is the rank of Kerala in the 'IPC crimes' category?

60. In the two states where the highest total number of cases are registered, the ratio of the total number of cases in IPC crimes to the total number in SLL crimes is closest to

1. 11:10 2. 19:20 3. 1:9 4. 3:2

61. Which of the following is DEFINITELY true about the ranks of states/UT in the 'other crimes' category?

i) Tamil Nadu: 2 ii) Puducherry: 3

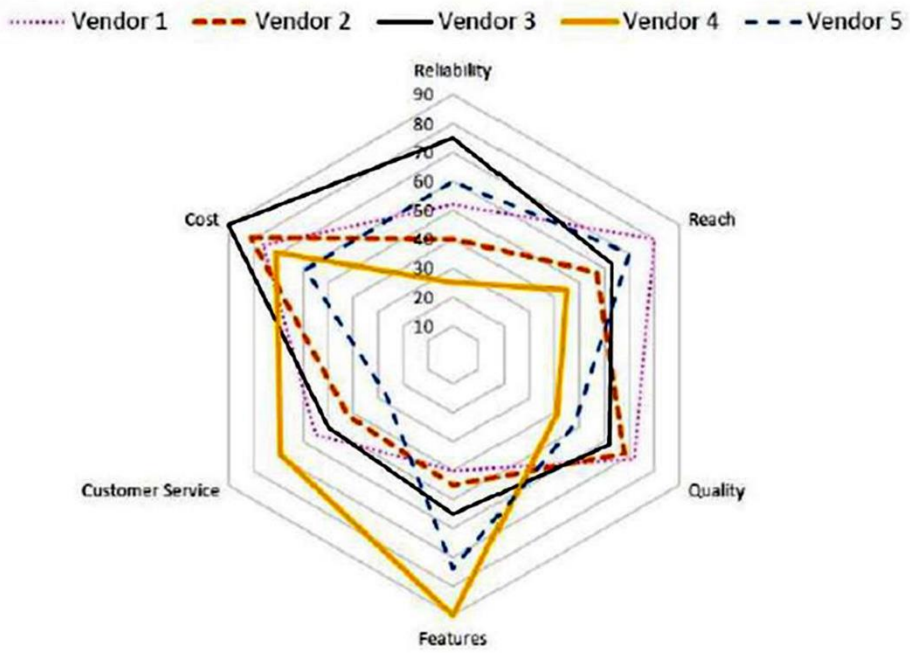
1. both i) and ii) 2. only i)

3. only ii) 4. neither i) , nor ii)

62. What is the sum of the ranks of Delhi in the three categories of crimes?

DIRECTIONS ***for questions 63 to 66:*** *Read the information and answer the given questions:*

Five vendors are being considered for a service. The evaluation committee evaluated each vendor on six aspects – Cost, Customer Service, Features, Quality, Reach, and Reliability. Each of these evaluations are on a scale of 0 (worst) to 100 (perfect). The evaluation scores on these aspects are shown in the radar chart. For example, Vendor 1 obtains a score of 52 on Reliability, Vendor 2 obtains a score of 45 on Features and Vendor 3 obtains a score of 90 on Cos



63. On which aspect is the median score of the five vendors the least?

1. Quality
2. Cost
3. Customer Service

64. A vendor's final score is the average of their scores on all six aspects. Which vendor has the highest final score?

1. Vendor 1
2. Vendor 2
3. Vendor 4
4. Vendor 3

65. List of all the vendors who are among the top two scorers on the maximum number of aspects is:

1. Vendor 2 and Vendor 5
2. Vendor 1 and Vendor 5
3. Vendor 1 and Vendor 2
4. Vendor 2, Vendor 3 and Vendor 4

66. List of all the vendors who are among the top three vendors on all six aspects is:

1. Vendor 1
2. None of the Vendors
3. Vendor 3
4. Vendor 1 and Vendor 3

Section - III: Quantitative Ability

67. A person invested a total amount of Rs 15 lakh. A part of it was invested in a fixed deposit earning 6% annual interest, and the remaining amount was invested in two other deposits in the ratio 2 : 1, earning annual interest at the rates of 4% and 3%, respectively. If the total annual interest income is Rs 76000 then the amount (in Rs lakh) invested in the fixed deposit was

68. In a race of three horses, the first beat the second by 11 metres and the third by 90 metres. If the second beat the third by 80 metres, what was the length, in metres, of the racecourse?

69. If $(5.55)^x = (0.555)^y = 1000$, then the value of $\frac{1}{x} - \frac{1}{y}$ is

1. 2/3 2. 3 3. 1 4. 1/3

70. The income of Amala is 20% more than that of Bimala and 20% less than that of Kamala. If Kamala's income goes down by 4% and Bimala's goes up by 10%, then the percentage by which

Kamala's income would exceed Bimala's is nearest to

1. 29 2. 28 3. 31 4. 32

71. Consider a function f satisfying $f(x + y) = f(x)\ f(y)$ where x, y are positive integers, and $f(1) = 2$.

If $f(a+1) + f(a+2) + \ldots\ldots + f(a+n) = 16\ (2^n - 1)$ then a is equal to

72. For any positive integer n, let $f(n) = n(n + 1)$ if n is even, and $f(n) = n + 3$ if n is odd. If m is a positive integer such that $8\ f(m + 1) - f(m) = 2$, then m equals

73. In a class, 60% of the students are girls and the rest are boys. There are 30 more girls than boys. If 68% of the students, including 30 boys, pass an examination, the percentage of the girls who do not pass is

74. If $a_1 + a_2 + a_3 + ... + a_n = 3(2^{n+1} - 2)$, for every $n \geq 1$, then a_{11} equals

75. Two cars travel the same distance starting at 10:00 am and 11:00 am, respectively, on the same day. They reach their common destination at the same point of time. If the first car travelled for at least 6 hours, then the highest possible value of the percentage by which the speed of the second car could exceed that of the first car is

1. 20 2. 25 3. 30 4. 10

76. The number of solution to the equation $|x|(6x^2 + 1) = 5x^2$ is

77. Let T be the triangle formed by the straight line $3x + 5y - 45 = 0$ and the coordinate axes. Let the circumcircle of T have radius of length L, measured in the same unit as the coordinate axes. Then, the integer closest to L is

78. If the rectangular faces of a brick have their diagonals in the ratio 3 : 2√3 : √15, then the ratio of the length of the shortest edge of the brick to that of its longest edge is

1. $1:\sqrt{3}$ 2. $\sqrt{3}:2$ 3. $\sqrt{2}:\sqrt{3}$ 4. $2:\sqrt{5}$

79. Let x and y be positive real numbers such that $\log_5 (x + y) + \log_5 (x - y) = 3$, and $\log_2 y - \log_2 x = 1 - \log_2 3$. Then xy equals

1. 25 2. 150 3. 100 4. 250

80. A club has 256 members of whom 144 can play football, 123 can play tennis, and 132 can play cricket. Moreover, 58 members can play both football and tennis, 25 can play both cricket and tennis, while 63 can play both football and cricket. If every member can play at least one game, then the number of members who can play only tennis is

1. 45 2. 43 3. 32 4. 38

81. The product of two positive numbers is 616. If the ratio of the difference of their cubes to the cube of their difference is 157:3, then the sum of the two numbers is

1. 50 2. 85 3. 58 4. 95

82. In a circle of radius 11 cm, CD is a diameter and AB is a chord of length 20.5 cm. If AB and CD intersect at a point E inside the circle and CE has length 7 cm, then the difference of the lengths of BE and AE, in cm, is

1. 2.5 2. 3.5 3. 1.5 4. 0.5

83. Three men and eight machines can finish a job in half the time taken by three machines and eight men to finish the same job. If two machines can finish the job in 13 days, then how many men can finish the job in 13 days?

84. Amala, Bina, and Gouri invest money in the ratio 3 : 4 : 5 in fixed deposits having respective annual interest rates in the ratio 6 : 5 : 4. What is their total interest income (in Rs) after a year, if Bina's interest income exceeds Amala's by Rs 250?

1. 7250 2. 7000 3. 6350 4. 6000

85. The product of the distinct roots of $|x^2 - x - 6| = x + 2$ is

1. -24 2. -4 3. -8 4. −16

86. The number of the real roots of the equation $2\cos(x(x + 1)) = 2^x + 2^{-x}$ is

1. infinite 2. 2 3. 0 4. 1

87. A chemist mixes two liquids 1 and 2. One litre of liquid 1 weighs 1 kg and one litre of liquid 2 weighs 800 gm. If half litre of the mixture weighs 480 gm, then the percentage of liquid 1 in the mixture, in terms of volume, is

1. 80 2. 75 3. 85 4. 70

88. AB is a diameter of a circle of radius 5 cm. Let P and Q be two points on the circle so that the length of PB is 6 cm, and the length of AP is twice that of AQ. Then the length, in cm, of QB is nearest to

1. 8.5 2. 9.3 3. 9.1 4. 7.8

89. Corners are cut off from an equilateral triangle T to produce a regular hexagon H. Then, the ratio of the area of H to the area of T is

1. 3 : 4 2. 2 : 3 3. 5 : 6 4. 4 : 5

90. Let S be the set of all points (x, y) in the x-y plane such that $|x|+|y| \leq 2$ and $|x| \geq 1$. Then, the area, in square units, of the region represented by S equals

91. Ramesh and Gautam are among 22 students who write an examination. Ramesh scores 82.5. The average score of the 21 students other than Gautam is 62. The average score of all the 22 students is one more than the average score of the 21 students other than Ramesh. The score of Gautam is

1. 48 2. 49 3. 53 4. 51

92. If a_1, a_2..... are in A.P., then,

$$\frac{1}{\sqrt{a_1}+\sqrt{a_2}}+\frac{1}{\sqrt{a_2}+\sqrt{a_3}}+....+\frac{1}{\sqrt{a_n}+\sqrt{a_{n+1}}} \text{ is equal to}$$

1. $\frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$
2. $\frac{n}{\sqrt{a_1}-\sqrt{a_{n+1}}}$
3. $\frac{n-1}{\sqrt{a_1}+\sqrt{a_{n-1}}}$
4. $\frac{n}{\sqrt{a_1}+\sqrt{a_{n+1}}}$

93. At their usual efficiency levels, A and B together finish a task in 12 days. If A had worked half as efficiently as she usually does, and B had worked thrice as efficiently as he usually does, the task would have been completed in 9 days. How many days would A take to finish the task if she works alone at her usual efficiency?

1. 24
2. 12
3. 18
4. 36

94. One can use three different transports which move at 10, 20, and 30 kmph, respectively. To reach from A to B, Amal took each mode of transport 1/3 of his total journey time, while Bimal took each mode of transport 1/3 of the total distance. The percentage by which Bimal's travel time exceeds Amal's travel time is nearest to

1. 22
2. 21
3. 19
4. 20

95. Meena scores 40% in an examination and after review, even though her score is increased by 50%, she fails by 35 marks. If her post-review score is increased by 20%, she will have 7 marks more than the passing score. The percentage score needed for passing the examination is

1. 75 2. 60 3. 80 4. 70

96. On selling a pen at 5% loss and a book at 15% gain, Karim gains Rs. 7. If he sells the pen at 5% gain and the book at 10% gain, he gains Rs. 13. What is the cost price of the book in Rupees?

1. 100 2. 80 3. 85 4. 95

97. The wheels of bicycles A and B have radii 30 cm and 40 cm, respectively. While traveling a certain distance, each wheel of A required 5000 more revolutions than each wheel of B. If bicycle B traveled this distance in 45 minutes, then its speed, in km per hour, was

1. 16π 2. 14π 3. 18π 4. 12π

98. With rectangular axes of coordinates, the number of paths from (1,1) to (8,10) via (4,6), where each step from any point (x, y) is either to (x, y+1) or to (x+1, y), is

99. If m and n are integers such that $\left(\sqrt{2}\right)^{19} 3^4\, 4^2\, 9^m\, 8^n = 3^n\, 16^m \left(\sqrt[4]{64}\right)$ then m is

1. -16
2. -24
3. -20
4. -12

100. If the population of a town is p in the beginning of any year then it becomes 3+2p in the beginning of the next year. If the population in the beginning of 2019 is 1000, then the population in the beginning of 2034 will be

1. $(1003)2^{15} - 3$
2. $(997)2^{14} + 3$
3. $(1003)^{15} + 6$
4. $(997)^{15} - 3$

Answer Key & Explanation

Q No.	Key	Explanations
1.	2	For this, we need to concentrate on Paragraphs 2 and 4 of the passage. In paragraph 2, the author says thatCasper and Glossier are exceptions to a dominant trend and in Paragraph 4, the author explains how these companies get pushedinto offering variety. Options 1 and 4 are easy to reject as they are not mentioned. Out of options 2 and 3, though both arefactually correct according to the passage, 2 is more appropriate because the question stem asks for the OVERALL PURPOSE of themention of these two companies. Hence, the answer should be option 2.
2.	2	Let us examine the options one by one. Option 1 - The second line of the passage contradicts this option and hence this option weakens the author's claim. Option 2 - The author relates to this when he/she mentions that a few companies which don't offer many options have sprung upbecause of choice anxiety. So, it is possible that those companies do better for a period of time than the companies which giveoptions. However, the author explains that even the

		companies which don't give options will start to offer options in order tosurvive. But it is entirely possible that for a period of time the annual sales growth of companies with fewer product options arehigher than that of companies which curated their products for target consumers Hence, this does not weaken the author'sclaim. Option 3 - According to the author, lifestyle influencers have a positive impact on consumers and the companies that hire themshould have higher sales. This option contradicts that claim and hence weakens. Option 4 - This option contradicts the author's claim mentioned in the last line of the third paragraph and hence weakens. Hence, the answer should be OPTION 2.
3.	2	A reading of paragraph 3 helps us get to the answer. The author expresses concern for America's lower classesand how with the options expanding, purchasing even basic things has become difficult for them (Last line of the third paragraph).Option 2 aligns the best with this thought process. Hence, the answer should be OPTION 2.
4.	3	The author's prediction is that the start-ups offering few product options will eventually have to move towardsvariety (Last paragraph

		first line and the further reading of this paragraph elaborates on this idea). The statement adding leastdepth is likely to be the one which contradicts this idea or does not support it very strongly. Let us examine the options one by one. Option 1 - If the start-ups with few product options are no exception to the American consumer market, then their fate is likely tobe determined by the trend in the market which favours companies offering variety. So this supports the author's idea fairlystrongly. Option 2 - If the government decides to double the tax-rates for these start-ups, then surviving and making profits becomes evenmore difficult for these companies and it lends support to the author's argument that these companies will have to move towardsvariety to meet the expectations of steep growth rate of the investors which can't be achieved by selling one great product. Option 3 - An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their productcatalogue means that they will be able to the investors' expectations without offering variety and this contradicts the author'sprediction. A very strong contender for

		the right answer. Option 4 - This option talks about what happens once the companies have already ventured into new products and the author'sprediction is that they will venture into new products. So what happens once the companies start offering variety is irrelevant tothe question. Hence, the answer should be OPTION 3.
5.	2	Options 1 & 4 can be inferred from the first few lines of the passage where the author talks about choice anxiety,etc. Option 3 can be inferred from the lines at the end of the first paragraph where the author talks about people gravitatingtowards lifestyle influencers. Option 2 cannot be inferred. Hence, the answer should be option 2.
6.	1	Option 1 - The point here is that the temperature of the Penguins' bodies (but not surface plumage) was higherthan the surrounding air which allowed for radiation to take place. The average air temperature mentioned in the passage is 0.32degrees Fahrenheit. Now, it makes no difference to the findings of the study reported if the temperature of the feet of penguins was1.76 degrees Fahrenheit (as mentioned in the passage) or 2.76 degrees Fahrenheit as in

		either case it is higher than the average airtemperature and radiation will take place. This implies that this option does not negate the findings of the study reported and hence should be the answer.Option 2 - Theproblem with this option is that if the heat transfer could not take place, then the study would have very different findings as muchof the explanation in the study is based on heat transfer through radiation and convection. Option 3 - This option would mean that the temperature on the plumage was higher than the average air temperature and thenheat would flow from plumage to the outside air. This is in direct contradiction with the findings of the study. Option 4 - If the average air temperature were -10 degrees Fahrenheit, then it would be lower than the temperature on theplumage. Hence, heat would flow from plumage to the outside air which contradicts the report in the study. Hence, the answer should be OPTION 1.
7.	2	The other three options result in gaining body heat (explained in the passage). Reproduction, however, is going toresult in the loss of body heat. Hence, the answer should be OPTION 2.
8.	1	The word 'Paradoxical' is defined as 'self-

		contradictory'. The author here means that though a part of Penguins'bodies (their plumage) is colder than the outside air, it actually helps keep their bodies warmer (which is kind of self-contradictory). Option 2 - This statement, though true, is not self-contradictory and hence not paradoxical. Options 3 & 4 are factually incorrect according to the passage. Hence, the answer should be OPTION 1.
9.	2	In Paragraph 3, the author is talking about how the outside air (which is slightly warmer than the plumage)comes into contact with the plumage and donates minute amounts of heat back to the penguins, then cycles away at a slightlycolder temperature. The other options do not relate to the point being discussed in the last line of paragraph 3. Hence, the answer should be OPTION 2.
10.	4	From the lines ' Just as the effusive floral prints of the radical William Morris now cover genteel sofas, so therevolutionary intentions of many folk historians and revivalists have led to music that is commonly regarded as parochial andconservative. And yet – as newspaper columns periodically rejoice – folk is hip again, influencing artists, clothing and

		furnituredesigners, celebrated at music festivals, awards ceremonies and on TV, reissued on countless record labels & ' what the Victoriansocialist William Morris called the "anti-scrape", or an anti- capitalist conservationism (not conservatism) that solaced itself withthe vision of a pre- industrial golden age, it is clear that these examples lines highlight that folk music has been generallyconsidered revolutionary, parochial, etc but at the same ime it is admired and followed also. This is reflected in option 4.
11.	4	Electrification of folk music happened later and not the other way round. So this cannot be inferred as there is noconcrete evidence for the same. Option 1 can be inferred from last line of the first paragraph.Option 2 can be inferred from thirdparagraph. Option 3 can be inferred from last paragraph.
12.	2	From the lines ' Victorian socialist William Morris called the "anti-scrape", or an anti- capitalist conservationism (not conservatism) that solaced itself with the vision of a pre- industrial golden age. In Britain, folk may often appear a cosy,fossilised form, but when you look more closely, the idea of folk – who has the right to

		sing it, dance it, invoke it, collect it, belongto it or appropriate it for political or cultural ends – has always been contested territory, it is clear that folk music is considered tobe associated with past of something nostlagic (the key word is 'fossilised'). This is reflected in option 2. Other options do notreflect the seemingly assocoation of the folk music with the past.
13.	1	Option 1 is not referring to folk music being plural and diverse, instead it is showing the perception relted toappeal of this genre. Other option show the causes for plurality and diversity within the British folk tradition.
14.	2	From the lines 'so the revolutionary intentions of many folk historians and revivalists have led to music that iscommonly regarded as parochial and conservative. And yet – as newspaper columns periodically rejoice – folk is hip again,influencing artists, clothing and furniture designers, celebrated at music festivals, awards ceremonies and on TV, reissued oncountless record labels. Folk is a sonic "shabby chic", containing elements of the uncanny and eerie, as well as an antique veneer, awhiff of Britain's heathen dark ages. The very obscurity and anonymity of folk music's origins open up space for

		rampantimaginative fancies, the author is least likely to agree with this genre keeping homogeneity with each change. Hence answer isoption 2.
15.	1	From the lines ' As defined by the geographer Yi-Fu Tuan, topophilia is the affective bond between people andplace. His 1974 book set forth a wide-ranging exploration of how the emotive ties with the material environment vary greatly fromperson to person and in intensity, subtlety, and mode of expression., it is clear that option 1 is closest to author's understanding oftopoohilia. 'Topography' is features and hence option 2 rejected. Option 3 is about language and not land/area, therefore rejected.Option 4 is exactly opposite of what has been asked and hence rejected.
16.	3	From the lines 'Residents of upscale residential developments have disclosed how important it is to maintain theircommunity's distinct identity, often by casting themselves in a superior social position and by reinforcing class and racialdifferences. And just as a beloved landscape is suddenly revealed, so too may landscapes of fear cast a dark shadow over a placethat makes one feel a sense of dread or anxiety—or topophobia, it is claer that

		answer is option 3.
17.	3	From the lines ' Topophilia—and its very close conceptual twin, sense of place—is an experience that, howeverelusive, has inspired recent architects and planners. Most notably, new urbanism seeks to counter the perceived placelessness ofmodern suburbs and the decline of central cities through neo-traditional design motifs. Although motivated by good intentions,such attempts to create places rich in meaning are perhaps bound to disappoint. As Tuan noted, purely aesthetic responses oftenare suddenly revealed, but their intensity rarely is long-lasting. Topophilia is difficult to design for and impossible to quantify, andits most articulate interpreters have been self-reflective philosophers such as Henry David Thoreau, evoking a marvelously intricatesense of place at Walden Pond, and Tuan, describing his deep affinity for the desert', it is clear that this experience is verysubjective and personal and hence cannot be quantified. This is clearly reflected in option 3.
18.	4	From the line 'Topophilia connotes a positive relationship, but it often is useful to explore the darker affiliationsbetween people and place. Patriotism, literally meaning the love of one's

		terra patria or homeland, has long been cultivated bygoverning elites for a range of nationalist projects, including war preparation and ethnic cleansing. Residents of upscale residentialdevelopments have disclosed how important it is to maintain their community's distinct identity, often by casting themselves in asuperior social position and by reinforcing class and racial differences.', and this is reflected in option 4.
19.	4	From the lines 'Patriotism, literally meaning the love of one's terra patria or homeland, has long been cultivatedby governing elites for a range of nationalist projects, including war preparation and ethnic cleansing and the lines ' And just as abeloved landscape is suddenly revealed, so too may landscapes of fear cast a dark shadow over a place that makes one feel asense of dread or anxiety—or topophobia', it is clear that author will not contradict option 4 and hence is the answer option.
20.	3	The inversion being referred to is that instead of the idea that the story of Aladdin might have been inspired bythe plots of French fairy tales that came out around the same time, or that the story was invented in that 18th century period as abyproduct of French Orientalism, a fascination with stereotypical exotic Middle

		Eastern luxuries that was prevalent then, now thenew idea was that Diyab might have based it on his own life — the experiences of a Middle Eastern man encountering the Frenchand not vice-versa. We need to show which option "invalidates" this new idea i.e. which option says that the story of Aladdin was not based on Diyab'slife. Let us examine all the options one by one. Option 1 - If Galland acknowledged in the published translations of Arabian Nights that he heard the story of Aladdin from Diyab,then it means that the story is based on Diyab's life and hence the inversion does not get invalidated. Hence, this should not be theanswer. Option 2 - If the French fairy tales of the eighteenth century did not have rags-to-riches plot lines like that of the tale of Aladdin,then it means that the tale of Aladdin could not have been based on the French fairy tales, meaning it could then have been basedon Diyab's life rather. The inversion does not get invalidated. Hence, this should not be the answer. Option 3 - If the description of opulence in Hanna Diyab's and Antoine Galland's narratives bore no resemblance to each other, then Galland was

		not influenced by Diyab's narrative while writing his own, meaning that the storywas not based on Diyab's life. This is exactly what we need to invalidate the inversion. This option is a very strong contender forthe correct answer. Option 4 - Change of the name of the city does not matter as the story could still be based on Diyab's own life with a change inthe name of the city. The inversion does not get invalidated. Hence, this should not be the answer. Hence, the answer should be OPTION 3.
21.	1	According to the author, Galland heard the tale of Aladdin from Diyab (Last line of Paragraph 1). Anunderstanding of the first and the second paragraphs informs us that the author is of the opinion that Galland included the taletold by Diyab in Arabian Nights and it is highly likely that Diyab might have based the tale on his own life experiences. So, thisleads to OPTION 1 BEING THE ANSWER. Let us now examine the problems with the other options. Option 2 - Neither Galland nor Diyab found the tale of Aladdin in an incomplete medieval manuscript. So this option is incorrect. Option 3 - Galland did not derive the story from Diyab's travelogue Option 4 - The story of Aladdin does not have

		its origins in an undiscovered, incomplete manuscript of a medieval Arabiccollection of stories. So this option is factually incorrect.
22.	1	Towards the end of the passage, the author talks about Diyab's understanding of Paris' culture. He also talksabout the Ups and Downs faced by Diyab and his humble beginnings. The author also mentions that Diyab describes the vastwealth of Versailles. These three features also resonate with the character of Aladdin. Hence, Options 2, 3 and 4 will be incorrect.From option 1, we only get to know that Galland gets the story from description of Diyab. We can't conclude from this option thatAladdin is based on Diyab. Hence, the answer should be option 1.
23.	3	In the first two lines of the last paragraph, the author says that Aladdin is relevant even today because of its travelexperiences. Option 3 talks exactly about the same. Hence, the answer should be OPTION 3.
24.	1	In the third paragraph, the author says that many scholars thought the story of Aladdin might have been inspiredfrom French fairy tales. The author tries to disprove this by saying various instances from Diyab's life and how it would haveinspired him to base Aladdin upon him. Options 2, 3 and 4 support the

		author's claims whereas option a goes against the author'sclaims. Hence, the answer should be OPTION 1.
25.	2	After reading all the sentences/context, it is clearly understood that discussion moves round symbols and theirinterptetation modern context. Also some sort of analogy has also been drawn with historical context. In the rearrangement, theopening sentence has to be 4 , as it intruduces Robert Proctor and his idea ogf the symbols. After this 3 will come as it talks futherabout these symbols by drawing analogy symbols on sheilds of ancient knights. After this 1 will come, as it highlights the embededmeaning of the suffixes.After this 5 will come as it tells about the significance of 'tron' in having control. So the order is 4315. 2introduces the intellectual and cultral angles to the discusion of these symbols, which is off tangent and hence odd one out.
26.	2341	After reading all the sentences, it is understood that context moves round 'mind reading' and hence the openingsentence is 2. After this 3 will come as the key link is 'mid reading' . The examples 'developmental disorders' in 4 have been givenin 1. Hence 41 is a mandatory pair. The final rearrangent of the sentences will be

		2341
27.	3241	After reading all the sentences, it is understood that context starts from very specific case and then conclusion isdrawn. The context moves round the meaning and interptetation of phrase 'carpe diem' in different languages and its profoundimpact on our understanding of the world around us. The introductory sentence will be 3 and the hint for it is 'often' i.e. generallythe meaning of the phrase is 'seize the day'. After this 2 will come as it higlights the meaning of the same phrase in LatinLanguage. 4 is the summing up sentences 2 & 3. Both the interptetations (of the phrase) are same but have subtle difference as inthe way we value the world around us. Hence the final seqiuence is 3241.
28.	2	The keywords are 'hidden persuaders' , hidden consumer motivations' , 'supraliminal level' & consumers are noteven aware of their thought being manipulated by advertising companies. Option 1 and option 4 is rejected as Vance did notmention 'subliminal' level and this option says that people are aware of these manipulations. Option 3 is rejected as 'people arenot aware' of these manipulations. Hence the passage is aptly summarised by option 2.
29.	2	The keywords are 'hidden persuaders' , hidden

		consumer motivations' , 'supraliminal level' & consumers are noteven aware of their thought being manipulated by advertising companies. Option 1 and option 4 is rejected as Vance did notmention 'subliminal' level and this option says that people are aware of these manipulations. Option 3 is rejected as 'people arenot aware' of these manipulations. Hence the passage is aptly summarised by option 2.
30.	1	The context is comparison between pure science and engineering. The key lines are ' without regard to whether itwill afford any practical benefit', ' correlative applied science in which physical theories are put to some specific use,' ut anengineer's knowledge of the world is not the same as the physicist's knowledge' , & sometimes the true theories apply only underhighly idealized conditions which can only be created under controlled experimental situations'. All these key points aptlysummarized by option 1.
31.	4123	After reading all the sentence it is easy to figure out that opening sentence is 4, as it introduces the term' Collaborative filtering'. After this 1 will come as it is an exmaple of ' Collaborative filtering'. After this 2 will come as

		'thesealgorithims' referes to 'results' shown is 1. The 'problem ' in 2 is exeeplified in 3. Hence 4123
32.	3241	The context moves round 'learning how to handle online criticism' and if it doesnot happen 'what this lead to'. Theopening sentence is 3. After this 2 will come as it tells one of the mature ways to accept/ handle criticism. 1 will happen if 4 doesnot come into the picture. Hence the final sequece of the sentences 3241
33.	2	The context moves around the rights of hearing impaired or some preconcieved notions about hearing impaired.The opener in this case is 5. After this 3 will come as it shows the result of 5. 'this prejudice' refers to the 'denied rights' in 3. 1 tellfurther about Pedro Ponce de León'. So the order of these four ot of five sentences is '5341'. Hence the odd one out is 2 as it talks alittle off tangent about the same i.e 'deaf are incapable of speech'.
34.	1	After reading all the sentences it can be deduced that context is about ' Identity is one of the most importantfeatures of organizations' and its differing views. Afere this 3 will come as it further tells types of identites'. 5 & 2 form amandatory pair. So the order of the sentences is 4352. 1 is odd one as it takes the

<table>
<tr><td></td><td></td><td>discussion to altogether diffetrent tangent.</td></tr>
<tr><td>35 - 38.</td><td colspan="2">Starting with F, F+F gives us F. only possible F can be 0 here.
<table>
<tr><td></td><td>B</td><td>H</td><td>A</td><td>A</td><td>G</td><td>0</td></tr>
<tr><td></td><td>A</td><td>H</td><td>J</td><td>0</td><td>K</td><td>0</td></tr>
<tr><td>A</td><td>A</td><td>0</td><td>G</td><td>C</td><td>A</td><td>0</td></tr>
</table>
In column 5, A+0 gives us C. This is only possible if 1 is carried forward from column 5. This have 2 interpretations, 1) G+K is more than 10, 2) C is one more than A.
Using 2nd and changing C's into A+1.
In column 3, H+H is equal 0. This can be done if H is 5 or 0. As F is 0, H can be 5 only.
In column 2, B+A is also A. This is possible if B is 0 but F is already 0. Further B can also be 9 for which 1 can be carried forward from column 3.
<table>
<tr><td></td><td>9</td><td>5</td><td>A</td><td>A</td><td>G</td><td>0</td></tr>
<tr><td></td><td>A</td><td>5</td><td>J</td><td>0</td><td>K</td><td>0</td></tr>
<tr><td>A</td><td>A</td><td>0</td><td>G</td><td>A+1</td><td>A</td><td>0</td></tr>
</table>
As only 1 can be carried forward, A can only be 1.
<table>
<tr><td></td><td>9</td><td>5</td><td>1</td><td>1</td><td>G</td><td>0</td></tr>
<tr><td></td><td>1</td><td>5</td><td>J</td><td>0</td><td>K</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>G</td><td>2</td><td>1</td><td>0</td></tr>
</table>
In column 6, G+K ends up with 1, so G and K can be 6+5 or 7+4 or 8+3 or 9+2. But as 9 and 5 are already done, G and K can be 7/4 or 8/3 only.</td></tr>
<tr><td>35.</td><td>1</td><td>In column 4, 1+J is equal to G without any</td></tr>
</table>

		carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.
36.	9	In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7
37.	7	In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.
38.	6	In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.
39 - 42.	We will make a table with composers on the vertical axis and dancers on the horizontal axis. Keep in mind that - Composers can assign 1st, 2nd, 3rd and 4th position in first round and remaining 5th to 8th position in second round.	

		Dancers			
		Princess	Queen	Rani	Samragni
Composers	Ashman				
	Badal				
	Gagan				
	Dyu				

From condition 3, the first performer was by Princess and this item was assigned by Badal. So we assign 1 in that position.

Similarly from condition 4, The last performance was by Rani; this item was assigned by Gagan. So we assign 8 in that position.

		Dancers			
		Princess	Queen	Rani	Samragni
Composers	Ashman				
	Badal	1			
	Gagan			8	
	Dyu				

From condition 1, Composer who assigned to Princess did not assigned any item to Queen.

Similarly, from condition 2, Composer who assigned to Rani did not assigned any item to Samragni.

		Dancers			
		Princess	Queen	Rani	Samragni
Composers	Ashman				
	Badal	1	*		
	Gagan			8	*
	Dyu				

It is given in question that the dancers performed their second items in the same sequence of their performance of their first items. This means that if someone performed at 1st position, he would again perform at 5th Similarly, someone who performs at 3rd position would perform at 7th position.

Thus princess has performed at 1st position so she would again perform at 5th. Similarly, Rani has performed at 8th position, so she would perform at 4th position.

		Dancers			
		Princess	Queen	Rani	Samragni
Composers	Ashman				
	Badal	1	*		
	Gagan			8	*
	Dyu				
Extra Notes (if any)		5th position		4th position	

From condition 5, we get that items assigned by Ashman were performed consecutively. This means that his items were 4 & 5. (when each composer has given the dance item to dancers one then only the composers would be able to give their second list of dances.) (Consecutive items assigned can only be 4 and 5th position)

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5		4		4th & 5th position
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

Let us see what different options are available to different composers. E.q. Badal has given 1st performance to princess, so he can assign 5,6,7,8 position in second round. Now 5th and 8th position are already taken by other composers, thus he is left with assigning 6th and 7th position

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*		6th or 7th position
	Gagan	*		8	*	2nd or 3rd position
	Dyu	*		*		2nd or 3rd position
Extra Notes (if any)						

From condition 5, we also get that the number of performances between items assigned by each of the remaining composers was the same.
Badal can assign 6^{th} or 7^{th} position. Check which one is true.
If Badal assign 6^{th} position, then as per condition 5, difference between both 1^{st} and 6^{th} position is 5 and that should be difference with rest all composers except Ashman. We will see if that is possible ofr other composers. Dyu will be left with 2^{nd} and 7^{th} position and difference is 5. Gagan is left will 3^{rd}postion. Difference 3^{rd} and 8^{th} is also 5. Thus case is true

		Dancers			
		Princess	Queen	Rani	Samragni
Composers	Ashman	5	*	4	*
	Badal	1	*	*	6
	Gagan	*	3	8	*
	Dyu	*	7	*	2
Extra Notes (if any)					

This is the final order as assigned by different composers

39.	2	The second performance was composed by Dyu
40.	1	Queen did not perform in any item composed by Green
41.	2	Badal

42.	3	The first and the six
43.	2	The number of items atleast doubles and there are total 100 boxes each containing an item. So minimum types can be 2 as 1st prize having 1 item of type A and 2nd having 99 items of type B.
44.	6	Similarly to last one, 1 item of type A then 2 of type B then 4 of type C then 8 of type D then 16 of type E then 32 of type F will sum upto 63 items. There cannot be type G because that will cross 100 item barrier. Hence 6.
45.	3	There is 1 item of type A. If there are exactly 30 items of type B then there will be 60 or more type C. If 69 type C, then This is possible. If there are exactly 45 type C then there must be 2 to 22 type B only summing upto 48 to 68 items. Now Type D must have at least 90 (double of 45) items but it is not possible. Exactly 60 type D is possible if there is 1 type A, 9 type B and 30 type C. 75 of type E is also possible. You ask for the type of item in box 45. Instead of being given a direct answer, you are told that there are 31 items of the same type as box 45 in boxes 1 to 44 and 43 items

		of the same type as box 45 in boxes 46 to 100.
46.	4	Now as per the additional information given in the question, there are a total of 75 boxes in which the same itemis given (one in box number 45 and 31 items in 1 - 44 boxes and 43 items in 46 - 100 boxes). Now the remaining 25 items has tobe maximized in terms of variety. There is 1 item of type A, so let there be 2 items of type B, 4 items of type C, 8 items of type D.Now after that if try to have 32 items of type E, the total items become more than 100. Thus there can be only 4 more types ofitems other than the one, which has been used in box number 45. So the total different types of items at the most can be 5.
47 - 50.	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table> We have to arrange 3 types of item (B, C and S) (total 12 items) in 16 shelves space. We can have 1 or 2 empty selves (E) between 2 items. It is known that K is on 16th shelves so we put that on 16^{th} (from condition 4) (From condition 4) It is given that D, E, F will be placed after biscuits and cookies so they will be in last item group. So we will put D, E, F in last shelves

in same order and K will be be last in that group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
												D	E	F	K
												D	E	F	K

(from condition 6) there should be 2 empty shelve before C. We also know that C is candy and there are 3 candies

We can arrange them in 2 different ways.

1	2	3	4	5	6	7	8	9	10	11	12	13
empty	empty				empty						empty	D
empty						empty	empty	C			empty	D

(from condition 7) There should be 1 empty shelve before L

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C			empty	L					empty	D	E	F	K
empty	L					empty	empty	C			empty	D	E	F	K

Now (from condition 2), I and J will be placed after A and B. (A….B….I/J….)
(From condition 5) L and J are items of the same type
Mixing above both conditions, we get that I, J, L are of same type and they must be biscuits as they cannot be candies (C is already a candy and they can be only 3 candies in total).
(From Condition 5) H is an item of a different type than L, J. Thus H will be in cookies group.

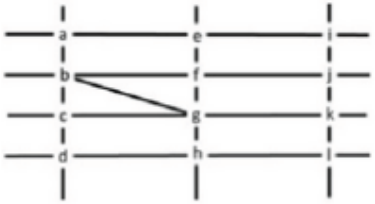
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/_)	(_/H)	empty	L					empty	D	E	F	K
empty	L					empty	empty	C	(H/_)	(_/H)	empty	D	E	F	K

(From condition 1) A and B are consecutive thus they lie in same group. They cannot be cookies are there is only 1 space left thus it will be in biscuit. (Biscuit will be A, B, I, J, L) and then G will be a

<table>
<tr><td></td><td colspan="3">cookies.
We know that AB are consecutive and I and J after them
<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr><tr><td>empty</td><td>empty</td><td>C</td><td>(H/G)</td><td>(G/H)</td><td>empty</td><td>L</td><td>A</td><td>B</td><td>(I/J)</td><td>(J/I)</td><td>empty</td><td>D</td><td>E</td><td>F</td><td>K</td></tr><tr><td>empty</td><td>L</td><td>A</td><td>B</td><td>(I/J)</td><td>(J/I)</td><td>empty</td><td>empty</td><td>C</td><td>(H/G)</td><td>(G/H)</td><td>empty</td><td>D</td><td>E</td><td>F</td><td>K</td></tr></table></td></tr>
<tr><td>47.</td><td>4</td><td></td></tr>
<tr><td>48.</td><td>4</td><td>G is not a type of biscuit (As we can clearly see that it is cookies in both cases)</td></tr>
<tr><td>49.</td><td>3</td><td>1, 2, 6, 12</td></tr>
<tr><td>50.</td><td>1</td><td>There are at least four shelves between items B and C</td></tr>
<tr><td>51 - 54.</td><td colspan="2">Point 1, Only 2 triangles are possible, BCG and BFG. X, U and Z are standing at these points.
Point 2, there is no one else in straight line of X.
Point 3, Y is on the straight line of U and W.
Point 4, Z and V are standing next to each other while U is also in the same row. Also, Z and are not on BG as then V won’t be standing in the same row. Hence, X is on B or G.
Point 5, W is in different row/column then of V and</td></tr>
</table>

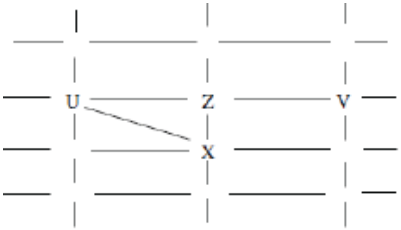
Z.

Point 6, D is empty.



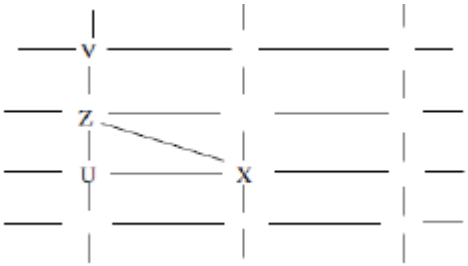
Following are the possible cases:

Case 1:



We cannot see V or Z. So W can only be at the intersection a. Since Y can see only U and W, Y can only be at c where X can see him. Hence this case is rejected.

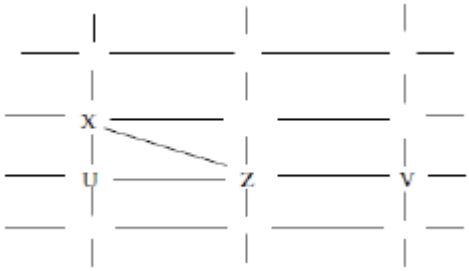
Case 2:



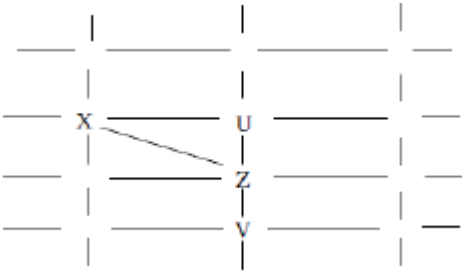
Y can only see U and W. Y cannot be placed anywhere. hence this case is also rejected.

Case 3:

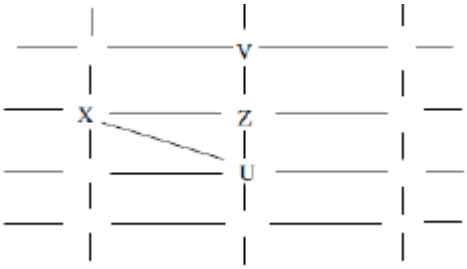
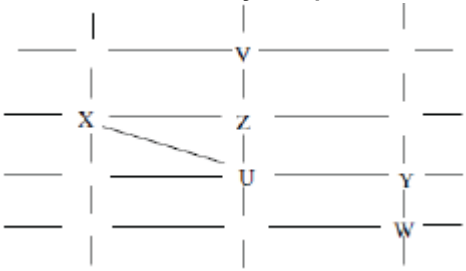
Y can only see U and W. Y cannot be placed anywhere. hence this case is also rejected.



Case 4:



Here W cannot see V or Z and X cannot see W so W can only be placed at i. Y can see only U and W, Y can only be placed at j or e, where he can see more people than U and W. Hence this case is also rejected.

	Case 5:  W cannot see V or Z. Y can only see U anw W. Hence W and Y can only be placed as shown:  The aboce mentioned case s the only case possible.	
51.	1	No one is standing at a.
52.	3	V can see U and Z only.
53.	4	X can reach Y through b-g, g-k. So minimum 2 street segments need to be crossed
54.	3	The person standing at d can see X and W only.
55 - 58.	Of its nostalgic association with a pre-industrial past.	

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	
Umeza	-	-	-	1	2	NP	
Wangdu	-	4	-	NP	NP	NP	
Xyla	-	-	-	1	5	-	
Yonita	-	-	3	5	NP	NP	
Zeneca	-	-	-	5	5	NP	

In this, First thing that we can conclude is that those who played 1 round out of round 4, 5 and 6 must have scored one 5 in their first 3 shots. Similarly 2 and 3 can be concluded.

By this, Xyla must have scored 5 in each round. Tanzi scored a 5 in either round 1 or 3. Umeza must have scored 2 5's in 3 rounds. And so on.

Accordingly, we can also put a bracket of possible scores for each of them.

For example, Tanzi scored a 4 in round 2 and 5 in round 5 and also a 5 in either round 1 or 3. Hence Tanzi's total score out of these 3 round can be 14. In the remaining round, Tanzi could have scored 1-4 (not 5 because then round 5 would also be there).

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15-18
Umeza	-	-	-	1	2	NP	14-17
Wangdu	-	4	-	NP	NP	NP	6-12
Xyla	5	5	5	1	5	-	22-26
Yonita	-	-	3	5	NP	NP	14-17
Zeneca	-	-	-	5	5	NP	21-24

By point 1, Tanzi, Umeza and Yonita had same score. So possible scores for these 3 would be 15-17.
By point 2, only 1 player had scored a non 3x score. Combining this with point 1, we see that possible scores for the can only be 15 or else there will be 3 people with non 3x score.
By point 3, Highest is one more than double of lowest. As we see that highest possible score is 22-26, lowest can only be 11-12. If 11, highest would be 23 and if 12, highest would be 25.
As only one of these could have had a non 3x score, we can eliminate 11 and 23.
So Possible scores now are

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	-	4	-	NP	NP	NP	12
Xyla	5	5	5	1	5	-	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

We can fill some of the scores as per total, in each round.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

Tanzi: 5/1, Umeza: 5/5/2, Yonita: 5/2 and Zeneca: 5/5/(1/4)

By point 4, 5 in round 1 are double than round 3.

Now if there is only 1 bullseye in round 3. Umeza and Zeneca doesn't score 5 in round 3, then they must score 5 in round 2. This will make 5's in round 2 more than 2. So the case is invalid.

That means there must be 4 bullseyes in round 2.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	5	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	-	5	-	5	5	NP	21/24

By point 5, Tanzi and Zeneca had same score in round 1 but different in round 3.

So one of them must have scored a 5 in either round 1 or 3. This means there are 2 bullseye in round 3 and Umeza must have scored it in round 1 only.

Concluding from this,

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	5	4	1	5	NP	NP	15
Umeza	5	5	2	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	4	5	5	5	5	NP	24

55.	1	25
56.	4	24
57.	2	Xyla was the highest scorer
58.	3	1

59 - 62.

	IPC	SLL	Others	Total
Telengana	4	15	6	25
Puducherry	1		30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	15	35	6	56
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	49	26	91
Delhi	64	36	45	145
West Bengal	0	520	0	520

59.	5	So that is the rank of Kerala in the 'IPC crimes' category is 5.
60.	3	The ratio of the total number of cases in IPC crimes to the total number in SLL crimes is in the two states where the highest totalnumber of cases are registered = 64 : 520 + 36 = 64 : 556 = 1:9
61.	1	Both I and II
62.	5	Delhi's rank in IPC is 1 Delhi's Rank in SLL is 3 (consider West Bengal also as West Bengalis at rank 1) Delhi's rank in OTHERS is 1 Sum of ranks = 5
63.	3	Median scores will be the third score in ascending or descending order for any of the 6 aspects. Checking for above 4 aspects, we get median scores as Quality =62 Reliability=54 Cost=78 Customer Service=50 Least score is for Customer service.
64.	4	

	Cost	Customer Service	Features	Reach	Quality	Reliability	Total

		Vender 1	77	55	40	80	72	52	376
		Vender 2	82	42	45	58	69	40	336
		Vender 3	90	50	55	62	62	75	394
		Vender 4	72	70	90	45	40	26	343

Vender 3 has highest final score.

65. B

If we see the top 2 venders for each of the 6 aspects we will find our answer

	Top 2 Vendors
Cost	2,3
Customer Service	4,1
Features	4,5
Reach	1,5
Quality	1,2
Reliability	3,5

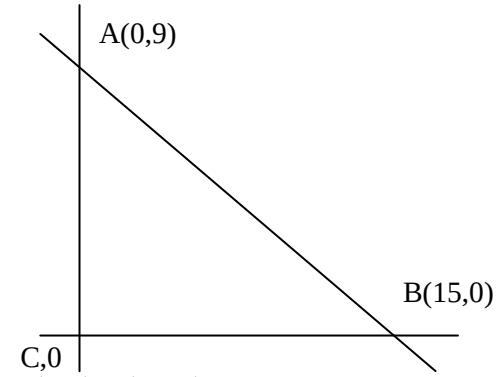
Vendor 1 and 5 comes for 3 times. Thus

<table>
<tr><td></td><td></td><td>Vendor 1 and vendor 5 is our answer.</td></tr>
<tr><td>66.</td><td>3</td><td>We will look for top 3 vendors in all aspects
<table>
<tr><td></td><td>Top 3 Vendors</td></tr>
<tr><td>Cost</td><td>2,3,1</td></tr>
<tr><td>Customer Service</td><td>4,1,3</td></tr>
<tr><td>Features</td><td>4,5,3</td></tr>
<tr><td>Reach</td><td>1,5,3</td></tr>
<tr><td>Quality</td><td>1,2,3</td></tr>
<tr><td>Reliability</td><td>3,5,1</td></tr>
</table>
Vendor 3 comes for maximum number of time.
Thus vendor 3 will be our answer.</td></tr>
<tr><td>67.</td><td>9</td><td>Total = 15 lakh
Let the amount invested in fixed deposit be = x at 6% SI
Remaining amount = 15-x… which was invested in 2:1 at rates 4% and 3% per annum.
So amount ingested at 4% pa = 2/3 (15-x)
Amount invested at 3% pa = 1/3 (15-x)
Total interest after 1 year = 76000
So, (x×6×1)/100 + [2/3(15-x)×4×1]/100 + [1/3(15-x)×3×1]/100 = 76000
x = 9 lakh
So 9 lakh will be the answer.</td></tr>
<tr><td>68.</td><td>880</td><td>A beat B by 11 and A beat C by 90m. That means B is already 79 m ahead of C. Now B will beat C by 80m and B is already 79m ahead so B</td></tr>
</table>

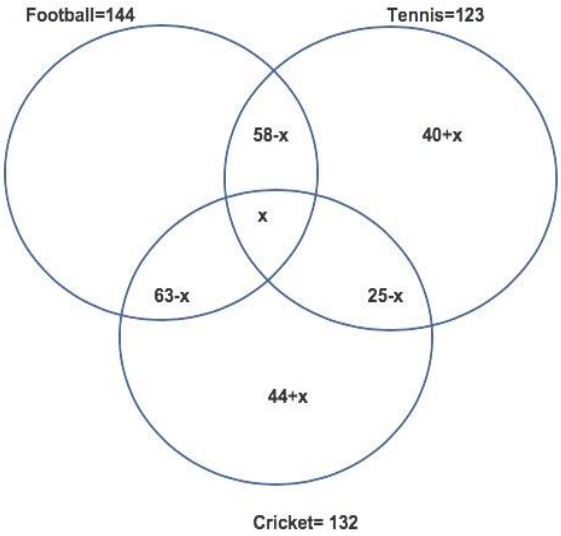
		will gain 1m lead in next 11m. So lead of 80m will be in the span of 80 × 11 = 880m
69.	4	$5.55^x = 1000$ $5.55 = 1000^1/x$ … eq1 $0.555^y = 1000$ $0.555 = 1000^1/y$… eq2 Dividing eq 1 and 2 $1/10 = 1000^{(1/x-1/y)}$ So $1/x - 1/y = 1/3$
70.	3	Let the income of Bimala is Rs. 100. So income of Amala is Rs. 120 and that of Kamala is Rs. 150. In second case, the income of Bimala becomes Rs. 110 and that of Kamala, it becomes Rs. 144. Required %age = $\frac{144-110}{110}\times 100 = \frac{34}{110}\times 100 = 30.9 \approx 31\%$
71.	3	As $f(x+y) = f(x)\,f(y) \Rightarrow f(x) = b^x$ Now $f(1) = 2 \Rightarrow b^1 = 2 \Rightarrow b = 2$. Given that $f(a+1) + f(a+2) + f(a+3) +$ ----------+ $f(a+n) = 16(2^n - 1)$ $\Rightarrow 2^{a+1} + 2^{a+2} + 2^{a+3} +$ .....+ $2^{a+n} = 16(2^n - 1)$ $\Rightarrow \frac{2^{a+1}(2^n-1)}{2-1} = 16(2^n-1)$ $\Rightarrow 2^{a+1} = 16 = 2^4 \Rightarrow a+1 = 4 \Rightarrow a = 3$
72.	10	We have $f(n) = \begin{cases} n(n+1), \text{if } n \text{ is even.} \\ n+3, \text{ if } n \text{ is odd.} \end{cases}$ Case I: If 'm' is odd :- m + 1 is even

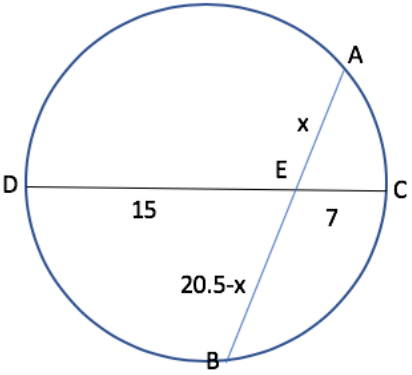
		∴ 8 f(m+1) - f(m) = 2 ⇒ 8 (m+1) (m+2) - (m + 3) = 2 ⇒ 8(m^2 + 3mn + 2) - m - 5 = 0 ⇒ 8m^2 + 24m +16 - m - 5 = 0 ⇒ 8m^2 + 23m + 11 = 0 Its discriminant = $(23)^2$ - 4 × 8 × 11 = 529 - 352 = 177 As the discriminant is not a perfect square, so we will not get integral values of 'm'. Case II: If 'm' is even :- m +1 is odd ∴ 8 f(m+1) - f(m) = 2 ⇒ 8(m+4) - m(m+1) = 2 ⇒ 8m + 32 - m^2 - m = 2 ⇒ m^2 - 7m - 30 = 0 ⇒ (m -10) (m+3) = 0 ⇒ m = 10, -3 A 'm' is +ve integer ⇒ m = 10
73.	20	Let the boys are x. So girls are x + 30 Total students = 2x + 30 Given that (2xd + 30) = 0.6 = x + 30 ⇒ 1.2x + 18 = x + 30 ⇒ 0.2x = 12 ⇒ x = 60 ∴ Boys = 60 and girls = 90 ∴ Total students = 150 Students who passed the exam = 68% of 150 = 102 ∴ Girls passed the exam = 102 - 30 = 72 ∴ Girls who failed = 90 - 72 = 18

		∴ Required percentage = $\frac{18}{90} \times 100 = 20\%$
74.	6144	a1 = 6 a1 + a2 = 18 a2 = 12 a1 + a2 + a3 = 42 a3 = 24 a1 + a2 + a3 + a4 = 90 a4 = 48 So a1, a2, a3, a4…an are in GP with ratio 2 So a11 = 6 (2^{10}) = 6(1024) = 6144
75.	1	Suppose first car starts 10:00 and it travelled for 6 hour. Assume speed of car 1 is 10km/h. So in 6 hour it travelled 60km. Now car B will travel same distance in 5 hour so $\frac{60}{5}$ = 12 km/h So, percentage change = $\frac{2}{10} \times 100 = 20\%$ Now if we take 7 hours instead of 6 hours we get $\frac{60}{7}$ = 8.57 And for car 2 it will be $\frac{60}{6}$ = 10km/h So percentage change is less than 20%. So at max it can be 20%
76.	5	Case I: If x ≥ 0 ⇒ |x| = x. ∴ |x| ($6x^2$ + 1) = $5x^2$ ⇒ x($6x^2$ + 1) = $5x^2$

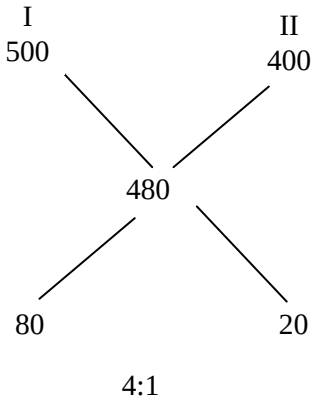
		$\Rightarrow x(6x^2 - 5x + 1) = 0$ $\Rightarrow x(3x-1)(2x-1) = 0$ $\Rightarrow x = 0, \frac{1}{3}, \frac{1}{2}$ Case II: if $x < 0 \Rightarrow \|x\| = -x$ $\therefore \|x\|(6x^2 + 1) = 5x^2$ $\Rightarrow -x(6x^2 + 1) = 5x^2$ $\Rightarrow x(6x^2 + 5x + 1) = 0$ $\Rightarrow (6x^2 + 5x + 1) = 0 [\because x < 0]$ $\Rightarrow (3x + 1)(2x + 1) = 0$ $x = \frac{-1}{3}, \frac{-1}{2}$ $\therefore$ total 5 solution are possible
77.	9	The equation of line is $3x + 5y - 45 = 0$ .....(1) Put $x = 0 \Rightarrow y = 9$ Put $y = 0 \Rightarrow x = 15$  $\therefore$ a(0,9) B(15,0) are point on coordinate axes where the line cuts the coordinate axes.

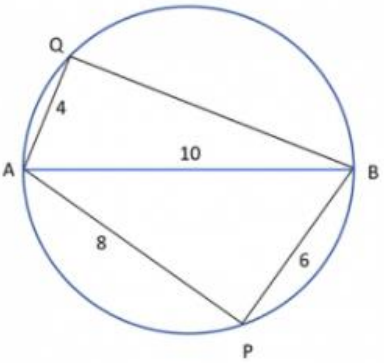
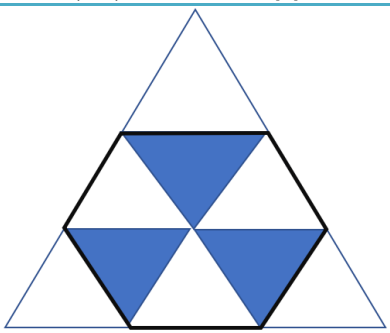
		Length AB of hypotenuse $= \sqrt{15^2 + 9^2} = \sqrt{306} = 17.5$ ∴ circum radius = 1/2 × hy = 1/2 × 17.5 = 8.75 ≈ 9.
78.	1	Let a, b and c be the three sides. So, $a^2 + b^2 = 9$ $b^2 + c^2 = 12$ $c^2 + a^2 = 15$ So, $2a^2 + 2b^2 + 2c^2 = 36$ $a^2 + b^2 + c^2 = 18$ So, $c^2 = 9$, c = 3 a = √6 b = √3 So, ratio of shortest to longest = 1 : √3
79.	2	Given $\log_5 (x + y) + \log_5 (X-Y) = 3$ and $\log_2 Y - \log_2 x = 1 - \log_2 3$. $\text{Log}_5 (X + Y) + \log_5 (X-Y) = \log_5 (x^2-y^2) = 3$ $\Rightarrow x^2-y^2 = 5^3$ … eq1 $\log_2 Y - \log_2 x = 1 - \log_2 3$ $\log_2 (y/x) = \log_2 2 - \log_2 3$ $\log_2 (y/x) = \log_2 2/3$ y/x = 2/3 x=3y/2 ….. putting this in eq1 $9y^2/4-y^2 = 125$ $y^2=100$ y = 10

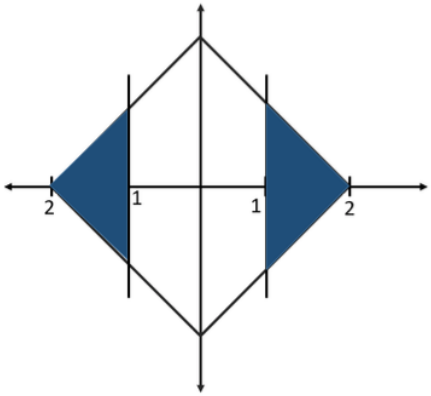
		x = 15 xy = 150
80.	2	 So, only football 144 + 109 + x = 256 x = 3 So, only tennis = 40 + x = 43
81.	1	Here xy = 616 Also $(x^3 - y^3)/(x-y)^3 = 157/3$ Now $x^3 - y^3 = (x-y)(x^2 + y^2 + xy)$ So $(x^2 + y^2 + xy)/(x^2 + y^2 - 2xy) = 157/3$ Let $x^2 + y^2 = t$ So $(t + 616)/(t-1232) = 157/3$

		t = 1268 $x^2 + y^2 = 1268$ $(x + y)^2 - 2xy = 1268$ $(x + y)^2 - 2^{616} = 1268$ $(x + y)^2 = 2500$ x + y = 50
82.	4	 When two chords intersect inside a circle then AE×BE = CE × DE So x (20.5-x) = 15 × 7 So x = 10.5 So AE = 10.5 BE = 10 Difference in lengths = 0.5
83.	13	It is given that)$3M + 8M_C$) × x = ($8M + 3M_C$) × 2x ⇒ $3M + 8M_C = 16M + 64M_C$ ⇒ $13M = 2M_C$

		$\Rightarrow 1\ M_C = \frac{13}{2}$ Men 2 Machines can do the work in 13 days $\Rightarrow$ 1 Machine can do it in 26 days $\therefore \frac{13}{2}$ Men can do the work in 26 days $\Rightarrow$ 13 Men can do it in 13 days
84.	1	Let money invested be in ratio 300x:400x:500x Bina's interest income = 400x$\times$ 5 $\times$ 1/100 Amala's interest income = 300x $\times$ 6 $\times$ 1/100 Difference = 2x = 250 X = 125 Total interest income = 20x + 18x + 20x = 58x = 58 $\times$ 125 = 7250
85.	4	We have $\lvert x^2 - x - 6\rvert = x+ 2 \Rightarrow x^2 - x - 6 = \pm (x + 2)$ Case I: If $x^2 - x - 6 = x + 2 \Rightarrow x^2 - 2x - 8 = 0$ $\Rightarrow (x - 4)(x + 2) = 0 \Rightarrow x = 4, -2$ Case II: If $x^2 - x - 6 = - (x+2)$ $\Rightarrow x^2 - x - 6 = -x-2$ $\Rightarrow x^2 = 4 \Rightarrow x = 2, -2$ $\therefore$ Product of distinct roots = 4 $\times$ 2 $\times$ (-2) = -16
86.	4	Since in LHS we have $\cos\theta$ whose value lies from – 1 to 1. So LHS can have value from – 2 to 2 RHS will always be > = 2 Since $2^x + 2^{-x} = (2^x) + (1/2^x)$ and we know that sum of a number and its reciprocal is always greater than or equal to 2 if is real using AM > =

		GM. So they intersect only once at x = 0 when value of LHS and RHS is 2
87.	1	One litre of liquid 1 weight 1 kg. ⇒ Half litre of liquid 1 weights 500 gm Illy half litre of liquid 2 weights 400 gm Using the rule of allegation ∴ Ratio of liquid 1 and liquid 2 is 4:1 ∴ liquid 1 is 4/5× 100 = 80% of the mixture  4:1 ∴ Ratio of liquid 1 and liquid 2 is 4:1 ∴ liquid 1 is 4/5× 100 = 80% of the mixture

88.	3	 Here ∠AQB = 90 Since angle is a semicircle is 90 Now as AB = 10 and PB = 6 so AP = 8 therefore AQ = 4 (as the length of AP is twice that of AQ.) So $AQ^2 + QB^2 = AB^2$ $100 = 16 + QB^2$ $QB = (84)^1/2 = 9.1$ approx.
89.	2	 We can see that the equilateral triangle is made up of 9 equal triangles Hexagon is made up of 6 equal triangles of same size. So ratio of areas = 6/9 = 2/3

90.	2	 Here we have required area shaded in blue where we have 4 triangle having height = 1 and base = 1 So total area = $4 \times (1/2 \times 1 \times 1) = 2$ units
91.	4	Let the score of Gautam = x $\therefore$ Total score = 21 ×62 + x = 1302 +x …… (i) Let the average of 21 students other than Ramesh is y $\therefore$ 21y + 82.5 = 22(y+1) $\Rightarrow$ 21y + 82.5 = 22y + 22 $\Rightarrow$ y = 60.5 $\therefore$ Total score = 22× 61.5 = 1353 …….. (2) (1) & (2) $\Rightarrow$ 1302 + x = 1353 $\Rightarrow$ x = 51
92.	4	Taking n = 3 and assuming $a_1 = 1$, $a_2 = 2$, $a_3 = 3$, $a_4 = 4\ \frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}}$ Rationalizing the denominator of all them, we got

		$\frac{1}{\sqrt{2}+\sqrt{1}}\times\frac{\sqrt{2}-\sqrt{1}}{\sqrt{2}-\sqrt{1}}+\frac{1}{\sqrt{3}+\sqrt{2}}\times\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}+\frac{1}{\sqrt{4}+\sqrt{3}}\times\frac{\sqrt{4}-\sqrt{3}}{\sqrt{4}-\sqrt{3}}$ $\Rightarrow\frac{\sqrt{2}-\sqrt{1}}{1}+\frac{\sqrt{3}-\sqrt{2}}{1}+\frac{\sqrt{4}-\sqrt{3}}{1}\Rightarrow\sqrt{2}-\sqrt{1}+\sqrt{3}-\sqrt{2}+\sqrt{4}-\sqrt{3}$ $\Rightarrow\sqrt{4}-\sqrt{1}=2-1=1$ Now, using option In option (4) $\frac{3}{\sqrt{1}+\sqrt{4}}\Rightarrow\frac{3}{3}=1$ So only option (4) satisfies.
93.	3	Let A can do 2x units per day and B can do y units per day As per the question 12(2x+y) = 9(x + 3y) ⇒ 24x + 12y = 9x + 27y ⇒ 15x = 15y ⇒ x = y Let x= y = 1, so A will do 2 units/day and B will don 1 units/day ∴ Total work = 12 (2+1) = 36 units ∴ A alone will do it in $\frac{36}{2}$ 36/2 = 18 days
94.	1	Let total distance = 60km So, Bimal will travel 1/3rd of total distance for each given speed That means with the speed of 10 he will travel for 20 km = 2 hour And with the speed of 20 km/h he will travel for 20 km = 1 hour And with the speed of 30 km he will travel for

		20 km = 2/3 hour So, total time = 3hour 40 min = 220 min Now, for Amal 1/3rd of total travel time that means with the speed 20 it will travel for 1 hour, with the speed of 10 he will travel for 1 hour and with the speed of 30 it will travel of 1 hour. So, total 3 hour = 180 min So, $\frac{40}{180} \times 100 = 22.22\% = 22\%$
95.	4	Let total marks be x Meena score 0.4x After review marks are increased by 50% So new marks = 0.4 × 1.5 = 0.6x But she still fails by 35 marks So passing mark = 0.6x + 35 Now if this post review score is increased by 20% So it becomes 1.2×0.6x, she gets 7 marks more than passing marks That means passing marks = 1.2 × 0.6x – 7 = 0.72x – 7 Equating passing marks in both the cases 0.6x + 35 = 0.72x – 7 0.12x = 42 X = 350 So passing marks = 350 × 0.6 + 35 = 245 So percentage marks required to pass = 245/350 × 100 = 70%

96.	2	Let CP of Pen = x and CP of book =y ATQ 0.95x + 1.15y = x + y + 7 -0.05x + 0.15y = 7 ------(1) 1.05x + 1.10y = x + y + 13 0.05x + 0.1y = 13 ------(2) Adding (1) and (2) We get 0.25y = 20 So, y = 80
97.	1	A travel 2πr = 60π B travel 2πr = 80π So LCM = 240π That means A travel for 4 revolution and B travel for 3 revolution. We need gap of 5000 revolution So B will travel 5000 × 240π cm distance in 45 min So speed = 5000 × 240π / 45cm / min To convert cm into km 1 km = 1000m and 1 m = 100cm So, 1 km = 100000cm, So 1cm = 10^{-5}km And 60 min = 1 hour So, speed = $5000 \times 240\pi \frac{60}{45} \times 100000 = 16\pi$
98.	3920	We want to go to (1, 1) to (8, 10) through (4, 6) So, first we will go to (1, 1) to (4, 6) and then (4,

		6) to (8, 10) So from (1, 1) to (4, 6) we have 5 + 3 = 8 ways = $\frac{8!}{5!3!} = 56$ And from (4, 6) to (8, 10) we have 4 and 4 = 8 ways So, $\frac{8!}{4!4!} = 70$ So, total 56 × 70 = 3920 ways
99.	4	$2^{(19/2 + 4 + 3n)} \times 3^{(4 + 2m)} = 2^{(3/2 + 4m)} \times 3^{(n)}$ Comparing powers of 2 and 3 in LHS and RHS 3n + 12 = 4m 4m – 3n = 12 And 2 + 2m = n 2m – n= - 4 Solving both N = - 20 and M = - 12
100.	1	Population in 2019 = 1000 Population in 2020 = 1000 × 2 +3 = 2003 = (1003) × 2 - 3 Population in 2021 = 2 × 2003 + 3 = 4009 = 4 × (1003) - 3 = 2^2 (1003) - 3 Population in 2022 = 2(4009) + 3 = 8021 = 8(1003) - 3 = 2^3 (1003) -3 ∴ we can see that population in 2034 is 2^{15} (1003) - 3

Section - I: Verbal Ability

DIRECTIONS ***for questions 1 to 24:*** *Read the passage and answer the question based on it.*

Passage - I

British colonial policy . . . went through two policy phases, or at least there were two strategies between which its policies actually oscillated, sometimes to its great advantage. At first, the new colonial apparatus exercised caution, and occupied India by a mix of military power and subtle diplomacy, the high ground in the middle of the circle of circles. This, however, pushed them into contradictions. For, whatever their sense of the strangeness of the country and the thinness of colonial presence, the British colonial state represented the great conquering discourse of Enlightenment rationalism, entering India precisely at the moment of its greatest unchecked arrogance. As inheritors and representatives of this discourse, which carried everything before it, this colonial state could hardly adopt for long such a self-denying attitude. It had restructured everything in Europe—the productive system, the political regimes, the moral and cognitive orders—and would do the same in India, particularly as some empirically inclined theorists of that generation considered the colonies a massive

laboratory of utilitarian or other theoretical experiments. Consequently, the colonial state could not settle simply for eminence at the cost of its marginality; it began to take initiatives to introduce the logic of modernity into Indian society. But this modernity did not enter a passive society. Sometimes, its initiatives were resisted by pre-existing structural forms. At times, there was a more direct form of collective resistance. Therefore the map of continuity and discontinuity that this state left behind at the time of independence was rather complex and has to be traced with care.

Most significantly, of course, initiatives for . . . modernity came to assume an external character. The acceptance of modernity came to be connected, ineradicably, with subjection. This again points to two different problems, one theoretical, the other political. Theoretically, because modernity was externally introduced, it is explanatorily unhelpful to apply the logical format of the 'transition process' to this pattern of change. Such a logical format would be wrong on two counts. First, however subtly, it would imply that what was proposed to be built was something like European capitalism. (And, in any case, historians have forcefully argued that what it was to replace was not like feudalism, with or without

modificatory adjectives.) But, more fundamentally, the logical structure of endogenous change does not apply here.

Here transformation agendas attack as an external force. This externality is not something that can be casually mentioned and forgotten. It is inscribed on every move, every object, every proposal, every legislative act, each line of causality. It comes to be marked on the epoch itself. This repetitive emphasis on externality should not be seen as a nationalist initiative that is so well rehearsed in Indian social science. . . .

Quite apart from the externality of the entire historical proposal of modernity, some of its contents were remarkable. . . . Economic reforms, or rather alterations did not foreshadow the construction of a classical capitalist economy, with its necessary emphasis on extractive and transport sectors. What happened was the creation of a degenerate version of capitalism —what early dependency theorists called the 'development of underdevelopment'.

1. All of the following statements about British colonialism can be inferred from the first paragraph, EXCEPT that it:

1. was at least partly an outcome of Enlightenment rationalism.

2. was at least partly shaped by the project of European modernity.

3. faced resistance from existing structural forms of Indian modernity.

4. allowed the treatment of colonies as experimental sites.

2. Consequently, the colonial state could not settle simply for eminence at the cost of its marginality; it began to take initiatives to introduce the logic of modernity into Indian society." Which of the following best captures the sense of this statement?

1. The colonial enterprise was a costly one; so to justify the cost it began to take initiatives to introduce the logic of modernity into Indian society.

2. The cost of the colonial state's eminence was not settled; therefore, it took the initiative of introducing modernity into Indian society.

3. The colonial state's eminence was unsettled by its marginal position; therefore, it developed Indian society by modernising it.

4. The colonial state felt marginalised from Indian society because of its own modernity; therefore, it sought to address that marginalisation by bringing its modernity to change Indian society.

3. Which one of the following 5-word sequences best captures the flow of the arguments in the passage?

1. Colonial policy — Enlightenment — external modernity — subjection— underdevelopment.

2. Military power — colonialism — restructuring — feudalism — capitalism.

3. Military power — arrogance — laboratory — modernity—capitalism.

4. Colonial policy — arrogant rationality — resistance—independence—development

4. Which of the following observations is a valid conclusion to draw from the author's statement that "the logical structure of endogenous change does not apply here. Here transformation agendas attack as an external force"?

1. The transformation of Indian society did not happen organically, but was forced by colonial agendas.

2. The endogenous logic of colonialism can only bring change if it attacks and transforms external forces.

3. Colonised societies cannot be changed through logic; they need to be transformed with external force.

4. Indian society is not endogamous; it is more accurately characterised as aggressively exogamous.

5. All of the following statements, if true, could be seen as supporting the arguments in the passage, EXCEPT:

1. the introduction of capitalism in India was not through the transformation of feudalism, as happened in Europe.

2. modernity was imposed upon India by the British and, therefore, led to underdevelopment.

3. throughout the history of colonial conquest, natives have often been experimented on by the colonisers.

4. the change in British colonial policy was induced by resistance to modernity in Indian society

Passage - II

For two years, I tracked down dozens of . . . Chinese in Upper Egypt [who were] selling lingerie. In a deeply conservative region, where Egyptian families rarely allow women to work or own businesses, the Chinese flourished because of their status as outsiders. They didn't gossip, and they kept their opinions to themselves. In a New Yorker article entitled "Learning to Speak Lingerie," I described the Chinese use of Arabic as another non-threatening characteristic. I wrote, "Unlike Mandarin, Arabic is inflected for gender, and Chinese dealers, who learn the language strictly by ear, often pick up speech patterns from female customers. I've come to think of it as the lingerie dialect, and there's something disarming about these Chinese men speaking in the feminine voice." . . .

When I wrote about the Chinese in the New Yorker, most readers seemed to appreciate the unusual perspective. But as I often find with topics that involve the Middle East, some people had trouble getting past the black-and-white quality of a byline. “This piece is so orientalist I don’t know what to do,” Aisha Gani, a reporter who worked at The Guardian, tweeted. Another colleague at the British paper, Iman Amrani, agreed: “I wouldn’t have minded an article on the subject written by an Egyptian woman—probably would have had better insight.” . . .

As an MOL (man of language), I also take issue with this kind of essentialism. Empathy and understanding are not inherited traits, and they are not strictly tied to gender and race. An individual who wrestles with a difficult language can learn to be more sympathetic to outsiders and open to different experiences of the world. This learning process—the embarrassments, the frustrations, the gradual sense of understanding and connection—is invariably transformative. In Upper Egypt, the Chinese experience of struggling to learn Arabic and local culture had made them much more thoughtful. In the same way, I was interested in their lives not because of some kind of voyeurism, but because I had also experienced Egypt and Arabic as an outsider. And both the Chinese and the

Egyptians welcomed me because I spoke their languages. My identity as a white male was far less important than my ability to communicate.

And that easily lobbed word—"Orientalist"—hardly captures the complexity of our interactions. What exactly is the dynamic when a man from Missouri observes a Zhejiang native selling lingerie to an Upper Egyptian woman? . . . If all of us now stand beside the same river, speaking in ways we all understand, who's looking east and who's looking west? Which way is Oriental?

For all of our current interest in identity politics, there's no corresponding sense of identity linguistics. You are what you speak—the words that run throughout your mind are at least as fundamental to your selfhood as is your ethnicity or your gender. And sometimes it's healthy to consider human characteristics that are not inborn, rigid, and outwardly defined. After all, you can always learn another language and change who you are.

6. The author's critics would argue that:

1. Language is insufficient to bridge cultural barriers.

2. Linguistic politics can be erased.

3. Empathy can overcome identity politics.

4. Orientalism cannot be practiced by Egyptians.

7. A French ethnographer decides to study the culture of a Nigerian tribe. Which of the following is most likely to be the view of the author of the passage?

1. The author would encourage the ethnographer and recommend him/her to hire a good translator for the purpose of holding interviews.

2. The author would discourage the ethnographer from conducting the study as Nigerian ethnographers can better understand the tribe.

3. The author would encourage the ethnographer, but ask him/her to be mindful of his/her racial and gender identity in the process.

4. The author would encourage the ethnographer, but ask him/her to first learn the language of the Nigerian tribe s/he wishes to study.

8. According to the passage, which of the following is not responsible for language's ability to change us?

1. Language's ability to mediate the impact of identity markers one is born with.

2. Language's intrinsic connection to our notions of self and identity.

3. The twists and turns in the evolution of language over time.

4. The ups and downs involved in the course of learning a language.

9. Which of the following can be inferred from the author's claim, "Which way is Oriental?"

1. Goodwill alone mitigates cultural hierarchies and barriers.

2. Orientalism is a discourse of the past, from colonial times, rarely visible today.

3. Globalisation has mitigated cultural hierarchies and barriers.

4. Learning another language can mitigate cultural hierarchies and barriers.

Passage - III

War, natural disasters and climate change are destroying some of the world's most precious cultural sites. Google is trying to help preserve these archaeological wonders by allowing users access to 3D images of these treasures through its site.

But the project is raising questions about Google's motivations and about who should own the digital copyrights. Some critics call it a form of "digital colonialism."

When it comes to archaeological treasures, the losses have been mounting. ISIS blew up parts of the ancient city of Palmyra in Syria and an earthquake hit Bagan, an ancient city in Myanmar, damaging dozens of temples, in 2016. In the past, all archaeologists and historians had for restoration and research were photos, drawings, remnants and intuition.

But that's changing. Before the earthquake at Bagan, many of the temples on the site were scanned. . . . [These] scans . . . are on Google's Arts & Culture site. The digital renditions allow viewers to virtually wander the halls of the temple, look up-close at paintings and turn the building over, to look up at its chambers. [Google Arts & Culture] works with museums and other nonprofits to put high-quality images online. The images of the temples in Bagan are part of a collaboration with CyArk, a nonprofit that creates the 3D scanning of historic sites. . . . Google says [it] doesn't make money off this website, but it fits in with Google's mission to make the world's information available and useful.

Critics say the collaboration could be an attempt by a large corporation to wrap itself in the sheen of culture. Ethan Watrall, an archaeologist, professor at Michigan State University and a member of the Society for American Archaeology, says he's not comfortable with the arrangement between CyArk and Google. Watrall says this project is just a way for Google to promote Google. "They want to make this material accessible so people will browse it and be filled with wonder by it," he says. "But at its core, it's all about advertisements and driving traffic." Watrall says these images belong on the site of a museum or educational institution, where there is serious scholarship and a very different mission. . . .

[There's] another issue for some archaeologists and art historians. CyArk owns the copyrights of the scans — not the countries where these sites are located. That means the countries need CyArk's permission to use these images for commercial purposes.

Erin Thompson, a professor of art crime at John Jay College of Criminal Justice in New York City, says it's the latest example of a Western nation appropriating a foreign culture, a centuries-long battle.CyArk says it copyrights the scans so no one can use them in an inappropriate way. The company says it works closely

with authorities during the process, even training local people to help. But critics like Thompson are not persuaded….She would prefer the scans to be owned by the countries and people where these sites are located.

10. Of the following arguments, which one is LEAST likely to be used by the companies that digitally scan cultural sites?

1. It provides images free of cost to all users.

2. It enables people who cannot physically visit these sites to experience them.

3. It allows a large corporation to project itself as a protector of culture.

4. It helps preserve precious images in case the sites are damaged or destroyed.

11. By "digital colonialism", critics of the CyArk–Google project are referring to the fact that:

1. CyArk and Google have not shared the details of digitisation with the host countries.

2. the scanning process can damage delicate frescos and statues at the sites.

3. countries where the scanned sites are located do not own the scan copyrights.

4. CyArk and Google have been scanning images without copyright permission from host countries.

12. Which of the following, if true, would most strongly invalidate Dr. Watrall's objections?

1. CyArk does not own the copyright on scanned images of archaeological sites.

2. CyArk uploads its scanned images of archaeological sites onto museum websites

3. Google takes down advertisements on its website hosting CyArk's scanned images

4. There is a ban on CyArk scanning archeological sites located in other countries

13. In Dr. Thompson's view, CyArk owning the copyright of its digital scans of archaeological sites is akin to:

1. the seizing of ancient Egyptian artefacts by a Western museum.

2. the illegal downloading of content from the internet.

3. digital platforms capturing users' data for market research

4. tourists uploading photos of monuments onto social media.

14. Based on his views mentioned in the passage, one could best characterise Dr. Watrall as being:

1. uneasy about the marketing of archaeological images for commercial use by firms such as Google and CyArk.

2. dismissive of laypeople's access to specialist images of archaeological and cultural sites.

3. opposed to the use of digital technology in archaeological and cultural sites in developing countries.

4. critical about the links between a non-profit and a commercial tech platform for distributing archaeological images

Passage - IV

The magic of squatter cities is that they are improved steadily and gradually by their residents. To a planner's eye, these cities look chaotic. I trained as a biologist and to my eye, they look organic. Squatter cities are also unexpectedly green. They have maximum density—1 million people per square mile in some areas of

Mumbai—and have minimum energy and material use. People get around by foot, bicycle, rickshaw, or the universal shared taxi.

Not everything is efficient in the slums, though. In the Brazilian favelas where electricity is stolen and therefore free, people leave their lights on all day. But in most slums recycling is literally a way of life. The Dharavi slum in Mumbai has 400 recycling units and 30,000 ragpickers. Six thousand tons of rubbish are sorted every day. In 2007, the Economist reported that in Vietnam and Mozambique, "Waves of gleaners sift the sweepings of Hanoi's streets, just as Mozambiquan children pick over the rubbish of Maputo's main tip. Every city in Asia and Latin America has an industry based on gathering up old cardboard boxes." . . .

In his 1985 article, Calthorpe made a statement that still jars with most people: "The city is the most environmentally benign form of human settlement. Each city dweller consumes less land, less energy, less water, and produces less pollution than his counterpart in settlements of lower densities." "Green Manhattan" was the inflammatory title of a 2004 New Yorker article by David Owen. "By the most significant measures," he wrote, "New York is the greenest community in the

United States, and one of the greenest cities in the world . . . The key to New York's relative environmental benignity is its extreme compactness. Placing one and a half million people on a twenty-three-square-mile island sharply reduces their opportunities to be wasteful." He went on to note that this very compactness forces people to live in the world's most energy-efficient apartment buildings. . . .

Urban density allows half of humanity to live on 2.8 per cent of the land. Consider just the infrastructure efficiencies. According to a 2004 UN report: "The concentration of population and enterprises in urban areas greatly reduces the unit cost of piped water, sewers, drains, roads, electricity, garbage collection, transport, health care, and schools." . . .

[T]he nationally subsidised city of Manaus in northern Brazil "answers the question" of how to stop deforestation: give people decent jobs. Then they can afford houses, and gain security. One hundred thousand people who would otherwise be deforesting the jungle around Manaus are now prospering in town making such things as mobile phones and televisions. . . .

Of course, fast-growing cities are far from an unmitigated good. They concentrate crime, pollution, disease and injustice as much as business, innovation, education and entertainment. But if they are overall a net good for those who move there, it is because cities offer more than just jobs. They are transformative: in the slums, as well as the office towers and leafy suburbs, the progress is from hick to metropolitan to cosmopolitan . . .

15. We can infer that Calthorpe's statement "still jars" with most people because most people:

1. do not consider cities to be eco-friendly places.
2. do not regard cities as good places to live in.
3. regard cities as places of disease and crime.
4. consider cities to be very crowded and polluted.

16. From the passage it can be inferred that cities are good places to live in for all of the following reasons EXCEPT that they:

1. offer employment opportunities
2. have suburban areas as well as office areas.
3. help prevent destruction of the environment
4. contribute to the cultural transformation of residents.

17. In the context of the passage, the author refers to Manaus in order to:

1. explain where cities source their labour for factories.

2. describe the infrastructure efficiencies of living in a city

3. explain how urban areas help the environment.

4. promote cities as employment hubs for people.

18. According to the passage, squatter cities are environment-friendly for all of the following reasons EXCEPT:

1. they sort out garbage.

2. they recycle material.

3. their streets are kept clean.

4. their transportation is energy efficient.

19. Which one of the following statements would undermine the author's stand regarding the greenness of cities?

1. Sorting through rubbish contributes to the rapid spread of diseases in the slums.

2. The high density of cities leads to an increase in carbon dioxide and global warming.

3. The compactness of big cities in the West increases the incidence of violent crime.

4. Over the last decade the cost of utilities has been increasing for city dwellers.

Passage - V

Around the world, capital cities are disgorging bureaucrats. In the post-colonial fervour of the 20th century, coastal capitals picked by trade-focused empires were spurned for "regionally neutral" new ones …. But decamping wholesale is costly and unpopular; governments these days prefer piecemeal dispersal. The trend reflects how the world has changed. In past eras, when information travelled at a snail's pace, civil servants had to cluster together. But now desk-workers can ping emails and video-chat around the world. Travel for face-to-face meetings may be unavoidable, but transport links, too, have improved. . . .

Proponents of moving civil servants around promise countless benefits. It disperses the risk that a terrorist attack or natural disaster will cripple an entire government. Wonks in the sticks will be inspired by new

ideas that walled-off capitals cannot conjure up. Autonomous regulators perform best far from the pressure and lobbying of the big city. Some even hail a cure for ascendant cynicism and populism. The unloved bureaucrats of faraway capitals will become as popular as firefighters once they mix with regular folk.

Beyond these sunny visions, dispersing central-government functions usually has three specific aims: to improve the lives of both civil servants and those living in clogged capitals; to save money; and to redress regional imbalances. The trouble is that these goals are not always realised.

The first aim—improving living conditions—has a long pedigree. After the second world war Britain moved thousands of civil servants to “agreeable English country towns” as London was rebuilt. But swapping the capital for somewhere smaller is not always agreeable. Attrition rates can exceed 80%. The second reason to pack bureaucrats off is to save money. Office space costs far more in capitals. Agencies that are moved elsewhere can often recruit better workers on lower salaries than in capitals, where well-paying multinationals mop up talent.

The third reason to shift is to rebalance regional inequality ….Norway treats federal jobs as a resource every region deserves to enjoy, like profits from oil. Where government jobs go, private ones follow

Sometimes the aim is to fulfil the potential of a country's second-tier cities. Unlike poor, remote places, bigger cities can make the most of relocated government agencies, linking them to local universities and businesses and supplying a better-educated workforce. The decision in 1946 to set up America's Centres for Disease Control in Atlanta rather than Washington, D.C., has transformed the city into a hub for health-sector research and business.

The dilemma is obvious. Pick small, poor towns, and areas of high unemployment get new jobs, but it is hard to attract the most qualified workers; opt for larger cities with infrastructure and better-qualified residents, and the country's most deprived areas see little benefit. . . .

Others contend that decentralisation begets corruption by making government agencies less accountable. A study in America found that state-government corruption is worse when the state capital is isolated—journalists, who tend to live in the bigger cities, become less watchful of those in power.

20. The "long pedigree" of the aim to shift civil servants to improve their living standards implies that this move:

1. takes a long time to achieve its intended outcomes.

2. has become common practice in several countries worldwide.

3. is supported by politicians and the ruling elites.

4. is not a new idea and has been tried in the past.

21. According to the author, relocating government agencies has not always been a success for all of the following reasons EXCEPT:

1. a rise in pollution levels and congestion in the new locations.

2. high staff losses, as people may not be prepared to move to smaller towns.

3. the difficulty of attracting talented, well-skilled people in more remote areas.

4. increased avenues of corruption away from the capital city.

22 The "dilemma" mentioned in the passage refers to:

1. relocating government agencies to boost growth in remote areas with poor amenities or to relatively larger cities with good amenities.

2. concentrating on decongesting large cities or focusing on boosting employment in relatively larger cities.

3. encouraging private enterprises to relocate to smaller towns or not incentivising them in order to keep government costs in those towns low.

4. keeping government agencies in the largest city with good infrastructure or moving them to a remote area with few amenities.

23. People who support decentralising central government functions are LEAST likely to

1. Policy makers may benefit from fresh thinking in a new environment.

2. It reduces expenses as infrastructure costs and salaries are lower in smaller cities.

3. More independence could be enjoyed by regulatory bodies located away from political centres.

4. It could weaken the nexus between bureaucrats and media in the capital.

24. According to the passage, colonial powers located their capitals:

1. based on political expediency.

2. to promote their trading interests.

3. to showcase their power and prestige.

4. where they had the densest populations

25. The four sentences (labelled 1, 2, 3, 4) given below, when properly sequence would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. Conceptualisations of 'women's time' as contrary to clock-time and clock-time as synonymous with economic rationalism are two of the deleterious results of this representation.

2. While dichotomies of 'men's time', 'women's time', clock-time, and caring time can be analytically useful, this article argues that everyday caring practices incorporate a multiplicity of times; and both men and women can engage in these

multiple-times

3. When the everyday practices of working sole fathers and working sole mothers are carefully examined to explore conceptualisations of gendered time, it is found that caring time is often more focused on the clock than generally theorised.

4. Clock-time has been consistently represented in feminist literature as a masculine artefact representative of a 'time is money' perspective

26. The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. Such a belief in the harmony of nature requires a purpose presumably imposed by the goodness and wisdom of a deity.

2. These parts, all fit together into an integrated, well-ordered system that was created by design.

3. Historically, the notion of a balance of nature is part observational, part metaphysical, and not scientific in any way.

4. It is an example of an ancient belief system called teleology, the notion that what we call nature has a predetermined destiny associated with its component parts.

27. The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. To the uninitiated listener, atonal music can sound like chaotic, random noise.

2. Atonality is a condition of music in which the constructs of the music do not 'live' within the confines of a particular key signature, scale, or mode.

3. After you realize the amount of knowledge, skill, and technical expertise required to compose or perform it, your tune may change, so to speak.

4. However, atonality is one of the most important movements in 20th century music.

DIRECTIONS ***for question 28 to 29:*** *The passage given below is followed by four alternate summaries.*

Choose the option that best captures the essence of the passage.

28. Language is an autapomorphy found only in our lineage, and not shared with other branches of our group such as primates. We also have no definitive evidence that any species other than Homo sapiens ever had language. However, it must be noted straightaway that 'language' is not a monolithic entity, but rather a complex bundle of traits that must have evolved over a significant time frame…. Moreover, language crucially draws on aspects of cognition that are long established in the primate lineage, such as memory: the language faculty as a whole comprises more than just the uniquely linguistic features.

1. Language is not a single, uniform entity but the end result of a long and complex process of linguistic evolution.

2. Language, a derived trait found only in humans, has evolved over time and involves memory.

3. Language is a distinctively human feature as there is no evidence of the existence of language in any other species.

4. Language evolved with linguistic features building on features of cognition such as memory.

29. Five sentences related to a topic are given below in a jumbled order. Four of them form a coherent and unified paragraph. Identify the odd sentence that does not go with the four. Key in the number of the option that you choose.

1. Socrates told us that 'the unexamined life is not worth living' and that to 'know thyself' is the path to true wisdom

2. It suggests that you should adopt an ancient rhetorical method favored by the likes of Julius Caesar and known as 'illeism' – or speaking about yourself in the third person.

3. Research has shown that people who are prone to rumination also often suffer from impaired decision making under pressure and are at a substantially increased risk of depression.

4. Simple rumination – the process of churning your concerns around in your head – is not the way to achieve self-realization.

5. The idea is that this small change in perspective can clear your emotional fog, allowing you to see past your biases.

DIRECTIONS ***for question 30 to 32:*** *The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.*

30. Social movement organizations often struggle to mobilize supporters from allied movements in their efforts to achieve critical mass. Organizations with hybrid identities—those whose organizational identities span the boundaries of two or more social movements, issues, or identities—are vital to mobilizing these constituencies. Studies of the post-9/11 U.S. antiwar movement show that individuals with past involvement in non-anti-war movements are more likely to join hybrid organizations than are individuals without involvement in non-anti-war movements. In addition, they show that organizations with hybrid

identities occupy relatively more central positions in inter-organizational contact networks within the antiwar movement and thus recruit significantly more participants in demonstrations than do nonhybrid organizations.

1. Movements that work towards social change often find it difficult to mobilize a critical mass of supporters.

2. Hybrid organizations attract individuals that are deeply involved in anti-war movements.

3. Organizations with hybrid identities are able to mobilize individuals with different points of view.

4. Post 9/11 studies show that people who are involved in non anti-war movements are likely to join hybrid organizations.

31. Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. A particularly interesting example of inference occurs in many single panel comics.

2. It's the creator's participation and imagination that makes the single-panel comic so engaging and so rewarding.

3. Often, the humor requires you to imagine what happened in the instant immediately before or immediately after the panel you're being shown.

4. To get the joke, you actually have to figure out what some of these missing panels must be.

5. It is as though the cartoonist devised a series of panels to tell the story and has chosen to show you only one – and typically not even the funniest.

32. The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. Living things—animals and plants—typically exhibit correlational structure.

2. Adaptive behaviour depends on cognitive economy, treating objects as equivalent.

3. The information we receive from our senses, from the world, typically has structure and order, and is not arbitrary.

4. To categorize an object means to consider it equivalent to other things in that category, and different—along some salient dimension—from things that are not.

DIRECTIONS ***for question 33:*** *The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.*

33. Privacy-challenged office workers may find it hard to believe, but open-plan offices and cubicles were invented by architects and designers who thought that to break down the social walls that divide people, you had to break down the real walls, too. Modernist architects saw walls and rooms as downright fascist. The spaciousness and flexibility of an open plan would liberate homeowners and office dwellers from the confines of boxes. But companies took up their idea less out of a democratic ideology than a desire to pack in as many workers as they could. The typical open-plan office of the first half of the 20th century was a

white-collar assembly line. Cubicles were interior designers' attempt to put some soul back in.

1. Wall-free office spaces did not quite work out the way their utopian inventors intended, as they became tools for exploitation of labor.

2. Wall-free office spaces could have worked out the way their utopian inventors intended had companies cared for workers' satisfaction.

3. Wall-free office spaces did not quite work out as companies don't believe in democratic ideology.

4. Wall-free office spaces did not quite work out as desired and therefore cubicles came into being.

34. Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.

Choose its number as your answer and key it in.

1. Ocean plastic is problematic for a number of reasons, but primarily because marine animals eat it.

2. The largest numerical proportion of ocean plastic falls in small size fractions.

3. Aside from clogging up the digestive tracts of marine life, plastic also tends to adsorb pollutants from the water column.

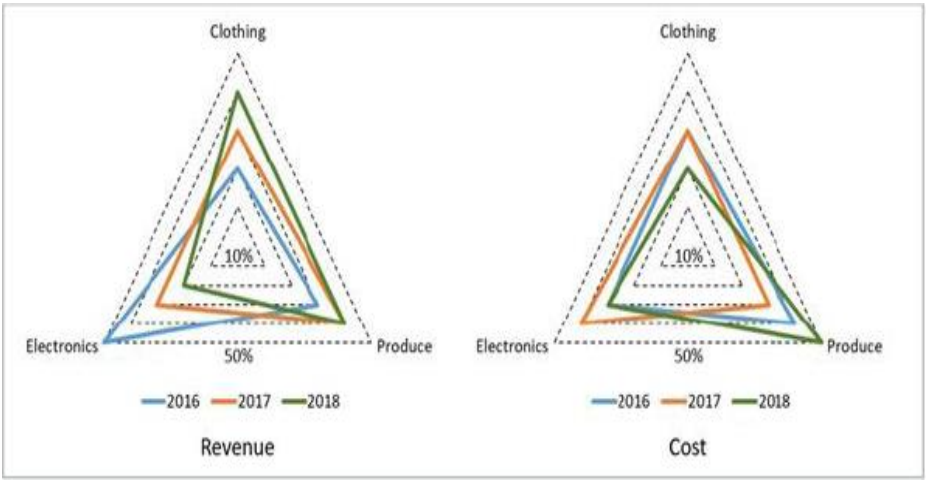
4. Plastic in the oceans is arguably one of the most important and pervasive environmental problems today.

5. Eating plastic has a number of negative consequences such as the retention of plastic particles in the gut for longer periods than normal food particles.

Section - II: DI & LR

DIRECTIONS ***for question 35 to 38:***

The following table represents addition of two six-digit numbers given in the first and the second rows, while the A large store has only three departments, Clothing, Produce, and Electronics. The following figure shows the percentages of revenue and cost from the three departments for the years 2016, 2017 and 2018. The dotted lines depict percentage levels. So for example, in 2016, 50% of store's revenue came from its Electronics department while 40% of its costs were incurred in the Produce department.



In this setup, Profit is computed as (Revenue – Cost) and Percentage Profit as Profit/Cost × 100%.

It is known that

1. The percentage profit for the store in 2016 was 100%.

2. The store's revenue doubled from 2016 to 2017, and its cost doubled from 2016 to 2018.

3. There was no profit from the Electronics department in 2017.

4. In 2018, the revenue from the Clothing department was the same as the cost incurred in the Produce department.

35. What was the percentage profit of the store in 2018?

36. What was the ratio of revenue generated from the Produce department in 2017 to that in 2018?

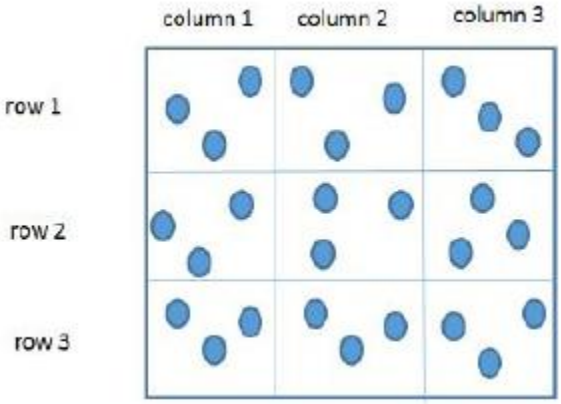
1. 4 : 3 2. 9 : 16 3. 8 : 5 4. 16 : 9

37. What percentage of the total profits for the store in 2016 was from the Electronics department?

38. What was the approximate difference in profit percentages of the store in 2017 and 2018?

1. 8.3 2. 15.5 3. 25.0 4. 33.3

DIRECTIONS *for questions 39 to 42:*



	Column 1	Column 2	Column 3
Row 1	(2, 4)	(6, 8)	(1, 3)
Row 2	(3, 5)	(1, 1)	(6, 20)
Row 3	(1, 2)	(1, 2)	(2, 5)

Three pouches (each represented by a filled circle) are kept in each of the nine slots in a 3 × 3 grid, as shown in the figure. Every pouch has a certain number of one-rupee coins. The minimum and maximum amounts of money (in rupees) among the three pouches in each of

the nine slots are given in the table. For example, we know that among the three pouches kept in the second column of the first row, the minimum amount in a pouch is Rs. 6 and the maximum amount is Rs. 8.

There are nine pouches in any of the three columns, as well as in any of the three rows. It is known that the average amount of money (in rupees) kept in the nine pouches in any column or in any row is an integer. It is also known that the total amount of money kept in the three pouches in the first column of the third row is Rs. 4.

39. What is the total amount of money (in rupees) in the three pouches kept in the first column of the second row?

40. How many pouches contain exactly one coin?

41. What is the number of slots for which the average amount (in rupees) of its three pouches is an integer?

42. The number of slots for which the total amount in its three pouches strictly exceeds Rs. 10 is

DIRECTIONS ***for questions 43 to 46:***

Students in a college are discussing two proposals –

A: a proposal by the authorities to introduce dress code on campus, and

B: a proposal by the students to allow multinational food franchises to set up outlets on college campus.

A student does not necessarily support either of the two proposals.

In an upcoming election for student union president, there are two candidates in fray: Sunita and Ragini. Every student prefers one of the two candidates.

A survey was conducted among the students by picking a sample of 500 students. The following information was noted from this survey.

1. 250 students supported proposal A and 250 students supported proposal B.

2. Among the 200 students who preferred Sunita as student union president, 80% supported proposal A.

3. Among those who preferred Ragini, 30% supported proposal A.

4. 20% of those who supported proposal B preferred Sunita.

5. 40% of those who did not support proposal B preferred Ragini.

6. Every student who preferred Sunita and supported proposal B also supported proposal A.

7. Among those who preferred Ragini, 20% did not support any of the proposals.

43. Among the students surveyed who supported proposal A, what percentage preferred Sunita for student union president?

44. What percentage of the students surveyed who did not support proposal A preferred Ragini as student union president?

45. What percentage of the students surveyed who supported both proposals A and B preferred Sunita as student union president?

1. 25 2. 50 3. 20 4. 40

46. How many of the students surveyed supported proposal B, did not support proposal A and preferred Ragini as student union president?

1. 150 2. 210 3. 200 4. 40

DIRECTIONS *for question 47 to 50:*

In the table below the check marks indicate all languages spoken by five people: Paula, Quentin, Robert, Sally and Terence. For example, Paula speaks only Chinese and English.

	Arabic	Basque	Chinese	Dutch	English	French
Paula			√		√	
Quentin				√	√	
Robert	√					√
Sally		√			√	
Terence			√			√

These five people form three teams, Team 1, Team 2 and Team 3. Each team has either 2 or 3 members. A team is said to speak a particular language if at least one of its members speak that language.

The following facts are known.

(1) Each team speaks exactly four languages and has the same number of members.

(2) English and Chinese are spoken by all three teams, Basque and French by exactly two teams and the other languages by exactly one team.

(3) None of the teams include both Quentin and Robert.

(4) Paula and Sally are together in exactly two teams.

(5) Robert is in Team 1 and Quentin is in Team 3.

47. Who among the following four is not a member of Team 2?

1. Sally 2. Terence 3. Paula 4. Quentin

48. Who among the following four people is a part of exactly two teams?

1. Quentin 2. Robert 3. Paula 4. Sally

49. Who among the five people is a member of all teams?

1. Paula 2. No one 3. Sally 4. Terence

50. Apart from Chinese and English, which languages are spoken by Team 1?

1. Basque and Dutch
2. Arabic and French
3. Basque and French
4. Arabic and Basque

DIRECTIONS *for question 51 to 54:*

Three doctors, Dr. Ben, Dr. Kane and Dr. Wayne visit a particular clinic Monday to Saturday to see patients. Dr. Ben sees each patient for 10 minutes and charges Rs. 100/-. Dr. Kane sees each patient for 15 minutes and charges Rs. 200/-, while Dr. Wayne sees each patient for 25 minutes and charges Rs. 300/-.

The clinic has three rooms numbered 1, 2 and 3 which are assigned to the three doctors as per the following table.

Room No.	Monday & Tuesday	Wednesday & Thursday	Friday & Saturday
1	Ben	Wayne	Kane
2	Kane	Ben	Wayne
3	Wayne	Kane	Ben

The clinic is open from 9 a.m. to 11.30 a.m. every Monday to Saturday.

On arrival each patient is handed a numbered token indicating their position in the queue, starting with token

number 1 every day. As soon as any doctor becomes free, the next patient in the queue enters that emptied room for consultation. If at any time, more than one room is free then the waiting patient enters the room with the smallest number. For example, if the next two patients in the queue have token numbers 7 and 8 and if rooms numbered 1 and 3 are free, then patient with token number 7 enters room number 1 and patient with token number 8 enters room number 3.

51. What is the maximum number of patients that the clinic can cater to on any single day?

1. 30 2. 12 3. 15 4. 31

52. The queue is never empty on one particular Saturday. Which of the three doctors would earn the maximum amount in consultation charges on that day?

1. Dr. Ben
2. Dr. Wayne
3. Both Dr. Wayne and Dr. Kane
4. Dr. Kane

53. Mr. Singh visited the clinic on Monday, Wednesday, and Friday of a particular week, arriving at 8:50

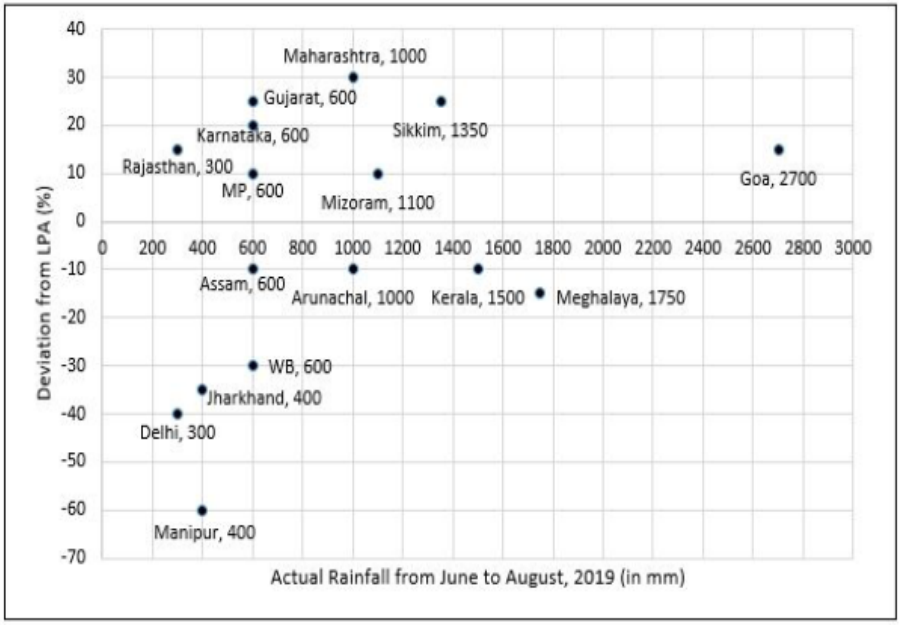
1. Monday
2. Wednesday
3. Same duration on all three days
4. Friday

54. On a slow Thursday, only two patients are waiting at 9 a.m. After that two patients keep arriving at

1. 0 2. 15 3. 10 4. 30

DIRECTIONS *for question 55 to 58:*

To compare the rainfall data, India Meteorological Department (IMD) calculated the Long Period Average (LPA) of rainfall during period June-August for each of the 16 states. The figure given below shows the actual rainfall (measured in mm) during June-August, 2019 and the percentage deviations from LPA of respective states in 2018. Each state along with its actual rainfall is presented in the figure.



55. If a 'Heavy Monsoon State' is defined as a state with actual rainfall from June-August, 2019 of 900

1. 57.14 2. 14.29 3. 75.00 4. 42.86

56. If a 'Low Monsoon State' is defined as a state with actual rainfall from June-August, 2019 of 750

1. -30% 2. -20% 3. 10% 4. -10%

57. What is the average rainfall of all states that have actual rainfall of 600 mm or less in 2019 and

1. 500 mm
2. 460 mm
3. 367 mm
4. 450 mm

58. The LPA of a state for a year is defined as the average rainfall in the preceding 10 years considering the period of June-August. For example, LPA in 2018 is the average rainfall during 2009-2018 and LPA in 2019 is the average rainfall during 2010-2019. It is also observed that the actual rainfall in Gujarat in 2019 is 20% more than the rainfall in 2009. The LPA of Gujarat in 2019 is closest to

1. 490 mm
2. 505 mm
3. 525 mm
4. 475 mm

DIRECTIONS *for question 59 to 62:*

The first year students in a business school are split into six sections. In 2019 the Business Statistics course was taught in these six sections by Annie, Beti, Chetan, Dave, Esha, and Fakir. All six sections had a common midterm (MT) and a common endterm (ET) worth 100 marks each. ET contained more questions than MT. Questions for MT and ET were prepared collectively by the six faculty

members. Considering MT and ET together, each faculty member prepared the same number of questions.

Each of MT and ET had at least four questions that were worth 5 marks, at least three questions that were worth 10 marks, and at least two questions that were worth 15 marks. In both MT and ET, all the 5-mark questions preceded the 10-mark questions, and all the 15- mark questions followed the 10-mark questions.

The following additional facts are known.

i. Annie prepared the fifth question for both MT and ET. For MT, this question carried 5 marks.

ii. Annie prepared one question for MT. Every other faculty member prepared more than one questions for MT.

iii. All questions prepared by a faculty member appeared consecutively in MT as well as ET.

iv. Chetan prepared the third question in both MT and ET; and Esha prepared the eighth question in both.

v. Fakir prepared the first question of MT and the last one in ET. Dave prepared the last question of MT and the first one in ET.

59. The second question in ET was prepared by:

1. Chetan 2. Beti 3. Dave 4. Esha

60. How many 5-mark questions were there in MT and ET combined?

1. 13 2. 10
3. Cannot be determined 4. 12

61. Who prepared 15-mark questions for MT and ET?

1. Only Beti, Dave, Esha and Fakir
2. Only Esha and Fakir
3. Only Dave, Esha and Fakir
4. Only Dave and Fakir

62. Which of the following questions did Beti prepare in ET?

1. Fourth question 2. Seventh question
3. Tenth question 4. Ninth question

DIRECTIONS *for question 63 to 66:*

Ten players, as listed in the table below, participated in a rifle shooting competition comprising of 10 rounds. Each round had 6 participants. Players numbered 1 through 6 participated in Round 1, players 2 through 7 in Round

2,..., players 5 through 10 in Round 5, players 6 through 10 and 1 in Round 6, players 7 through 10, 1 and 2 in Round 7 and so on.

The top three performances in each round were awarded 7, 3 and 1 points respectively. There were no ties in any of the 10 rounds. The table below gives the total number of points obtained by the 10 players after Round 6 and Round 10.

Player No.	Player Name	Points after Round 6	Points after Round 10
1	Amita	8	18
2	Bala	2	5
3	Chen	3	6
4	David	6	6
5	Eric	3	10
6	Fatima	10	10
7	Gordon	17	17
8	Hansa	1	4
9	Ikea	2	17
10	Joshin	14	17

The following information is known about Rounds 1 through 6:

1. Gordon did not score consecutively in any two rounds.

2. Eric and Fatima both scored in a round.

The following information is known about Rounds 7 through 10:

1. Only two players scored in three consecutive rounds. One of them was Chen. No other player scored in any two consecutive rounds.

2. Joshin scored in Round 7, while Amita scored in Round 10.

3. No player scored in all the four rounds.

63. What were the scores of Chen, David, and Eric respectively after Round 3?

1. 3, 6, 3 2. 3, 0, 3 3. 3, 3, 3 4. 3, 3, 0

64. Which three players were in the last three positions after Round 4?

1. Bala, Ikea, Joshin 2. Bala, Hansa, Ikea
3. Hansa, Ikea, Joshin 4. Bala, Chen, Gordon

65. Which player scored points in maximum number of rounds?

1. Ikea 2. Joshin 3. Chen 4. Amita

66. Which players scored points in the last round?

1. Amita, Chen, Eric 2. Amita, Chen, David
3. Amita, Bala, Chen 4. Amita, Eric, Joshin

Section - III: Quantitative Ability

67. The strength of a salt solution is p% if 100 ml of the solution contains p grams of salt. Each of three vessels A, B, C contains 500 ml of salt solution of strengths 10%, 22%, and 32%, respectively. Now, 100 ml of the solution in vessel A is transferred to vessel B. Then, 100 ml of the solution in vessel B is transferred to vessel C. Finally, 100 ml of the solution in vessel C is transferred to vessel A. The strength, in percentage, of the resulting solution in vessel A is

1. 15 2. 13 3. 14 4. 12

68. The quadratic equation $x^2 + bx + c = 0$ has two roots 4a and 3a, where a is an integer. Which of the following is a possible value of $b^2 + c$?

1. 3721 2. 549 3. 361 4. 427

69. Two ants A and B start from a point P on a circle at the same time, with A moving clock-wise and B moving anti-clockwise. They meet for the first time at 10:00 am when A has covered 60% of the track. If A returns to P at 10:12 am, then B returns to P at

1. 10:25 am 2. 10:18 am
3. 10:27 am 4. 10:45 am

70. The base of a regular pyramid is a square and each of the other four sides is an equilateral triangle, length of each side being 20 cm. The vertical height of the pyramid, in cm, is

1. 12 2. $10\sqrt{2}$ 3. $8\sqrt{3}$ 4. $5\sqrt{5}$

71. What is the largest positive integer such that $\frac{n^2+7n+12}{n^2-n-12}$ is also a positive integer?

1. 6 2. 16 3. 12 4. 8

72. Let A be a real number. Then the roots of the equation $x^2 - 4x - \log 2A = 0$ are real and distinct if and only if

1. $A < 1/16$ 2. $A < 1/8$
3. $A > 1/16$ 4. $A > 1/8$

73. Mukesh purchased 10 bicycles in 2017, all at the same price. He sold six of these at a profit of 25% and the remaining four at a loss of 25%. If he made a total profit of Rs. 2000, then his purchase price of a bicycle, in Rupees, was

1. 4000 2. 6000 3. 8000 4. 2000

74. The average of 30 integers is 5. Among these 30 integers, there are exactly 20 which do not exceed 5. What is the highest possible value of the average of these 20 integers?

1. 5 2. 3.5 3. 4.5 4. 4

75. Let f be a function such that f (mn) = f (m) f (n) for every positive integers m and n. If f (1), f (2) and f (3) are positive integers, f (1) < f (2), and f (24) = 54, then f (18) equals

76. Let $a_1, a_2, \ldots$ be integers such that

$a_1 - a_2 + a_3 - a_4 + \ldots + (-1)^{n-1} a_n = n$, for all $n \geq 1$.

Then $a_{51} + a_{52} + \ldots + a_{1023}$ equals

1. −1 2. 1 3. 0 4. 10

77. In an examination, Rama's score was one-twelfth of the sum of the scores of Mohan and Anjali. After a review, the score of each of them increased by 6. The revised scores of Anjali, Mohan, and Rama were in the ratio 11:10:3. Then Anjali's score exceeded Rama's score by

1. 32 2. 35 3. 24 4. 26

78. A cyclist leaves A at 10 am and reaches B at 11 am. Starting from 10:01 am, every minute a motor cycle leaves A and moves towards B. Forty-five such motor cycles reach B by 11 am. All motor cycles have the same speed. If the cyclist had doubled his speed, how many motor cycles would have reached B by the time the cyclist reached B?

1. 20 2. 23 3. 15 4. 22

79. Let ABC be a right-angled triangle with hypotenuse BC of length 20 cm. If AP is perpendicular on BC, then the maximum possible length of AP, in cm, is

1. 10 2. $6\sqrt{2}$ 3. 5 4. $8\sqrt{2}$

80. In a triangle ABC, medians AD and BE are perpendicular to each other, and have lengths 12 cm and 9 cm, respectively. Then, the area of triangle ABC, in sq cm, is

1. 80 2. 72 3. 78 4. 68

81. How many pairs (m, n) of positive integers satisfy the equation $m^2 + 105 = n^2$?

82. The real root of the equation $2^{6x} + 2^{3x+2} - 21 = 0$ is

1. $\frac{\log_2 7}{3}$ 2. $\log_2 27$ 3. $\frac{\log_2 3}{3}$ 4. $\log_2 9$

83. If x is a real number, then $\sqrt{\log_e \frac{4x - x^2}{3}}$ is a real number if and only if

1. $-3 \le x \le 3$ 2. $1 \le x \le 2$
3. $-1 \le x \le 3$ 4. $1 \le x \le 3$

84. John gets Rs 57 per hour of regular work and Rs 114 per hour of overtime work. He works altogether 172 hours and his income from overtime hours is 15% of his income from regular hours. Then, for how many hours did he work overtime?

85. Two circles, each of radius 4 cm, touch externally. Each of these two circles is touched externally by a third circle. If these three circles have a common tangent, then the radius of the third circle, in cm, is

1. $\pi/3$ 2. 1 3. $1/\sqrt{2}$ 4. $\sqrt{2}$

86. If $5^x - 3^y = 13438$ and $5^{x-1} + 3^{y+1} = 9686$, then $x + y$ equals

87. A man makes complete use of 405 cc of iron, 783 cc of aluminium, and 351 cc of copper to make a number of solid right circular cylinders of each type of metal. These cylinders have the same volume and each of these has radius 3 cm. If the total number of cylinders is to be kept at a minimum, then the total surface area of all these cylinders, in sq cm, is

1. $1044(4 + \pi)$ 2. $1026(1 + \pi)$ 3. 8464π 4. 928π

88. In an examination, the score of A was 10% less than that of B, the score of B was 25% more than that of C, and the score of C was 20% less than that of D. If A scored 72, then the score of D was

89. How many factors of $2^4 \times 3^5 \times 10^4$ are perfect squares which are greater than 1?

90. John jogs on track A at 6 kmph and Mary jogs on track B at 7.5 kmph. The total length of tracks A and B is 325 metres. While John makes 9 rounds of track A, Mary makes 5 rounds of track B. In how many seconds will Mary make one round of track A?

91. Let a, b, x, y be real number such that $a^2 + b^2 = 25$, $x^2 + y^2 = 169$, and $ax + by = 65$. If $k = ay - bx$,

1. $k = 0$ 2. $k = \frac{5}{13}$ 3. $0 < k \leq \frac{5}{13}$ 4. $k > \frac{5}{13}$

92. The number of common terms in the two sequences: 15, 19, 23, 27,……., 415 and 14, 19, 24,

1. 19 2. 20 3. 21 4. 18

93. In 2010, a library contained a total of 11500 books in two categories - fiction and non- fiction. In 2015, the library contained a total of 12760 books in these two categories. During this period, there was 10% increase in the fiction category while there was 12% increase in the non-fiction category. How many fiction books were in the library in 2015?

1. 6600 2. 6160 3. 5500 4. 6000

94. In a six-digit number, the sixth, that is, the rightmost, digit is the sum of the first three digits, the fifth digit is the sum of first two digits, the third digit is equal to the first digit, the second digit is twice the first digit and the fourth digit is the sum of fifth and sixth digits. Then, the largest possible value of the fourth digit is

95. The salaries of Ramesh, Ganesh and Rajesh were in the ratio 6:5:7 in 2010, and in the ratio 3:4:3 in 2015. If Ramesh's salary increased by 25% during 2010-2015, then the percentage increase in Rajesh's salary during this period is closest to

1. 9 2. 7 3. 8 4. 10

96. If $(2n + 1) + (2n + 3) + (2n + 5) + ... + (2n + 47) = 5280$, then what is the value of $1 + 2 + 3 + ...+ n$?

97. Let A and B be two regular polygons having a and b sides, respectively. If b = 2a and each interior angle of B is 3/2 times each interior angle of A, then each interior angle, in degrees, of a regular polygon with a + b sides is

98. Anil alone can do a job in 20 days while Sunil alone can do it in 40 days. Anil starts the job, and after 3 days, Sunil joins him. Again, after a few more days, Bimal joins them and they together finish the job. If Bimal has done 10% of the job, then in how many days was the job done?

1. 15 2. 12 3. 13 4. 14

99. Amal invests Rs 12000 at 8% interest, compounded annually, and Rs 10000 at 6% interest, compounded semi-annually, both investments being for one year. Bimal invests his money at 7.5% simple interest for one year. If Amal and Bimal get the same amount of interest, then the amount, in Rupees, invested by Bimal is

100. A shopkeeper sells two tables, each procured at cost price p, to Amal and Asim at a profit of 20% and at a loss of 20%, respectively. Amal sells his table to Bimal at a profit of 30%, while Asim sells his table to Barun at a loss of 30%. If the amounts paid by Bimal and Barun are x and y, respectively, then (x −y) / p equals

1. 0.7 2. 1 3. 0.50 4. 1.2

Answer Key & Explanation

Q No	Key	Explanation
1.	3	option 1 can be inferred from lines " For, whatever their sense of the strangeness of the country and the thinness of colonial presence,the British colonial state represented the great conquering discourse of Enlightenment rationalism, entering India precisely at the moment of its greatest uncheckedarrogance. As inheritors and representatives of this discourse, which carried everything before it, this colonial state could hardly adopt for long such a self-denyingattitude" option 2 and 4 can be inferred from "It had restructured everything in Europe—the productive system, the political regimes, the moral and cognitive orders—and woulddo the same in India, particularly as some empirically inclined theorists of that generation considered the colonies a massive laboratory of utilitarian or other theoreticalexperiments." option 3 is true for British Modernity while the question is about British colonialism. Hence option 3 is the correct answer here to the 'except' ques

2.	4	The colonial enterprise was a costly one is incorrect The cost of colonial state's eminence was not settled or colonial state was 'unsettled/in doubt' are also not implied The statement talks about the colonial state could not settle simply for eminence at the cost of its marginality. option 4 capturesthe essence of the statement
3.	1	The passage start with policy refer lines " British colonial policy . . . went through two policy phases, or at leastthere were two strategies between which its policies actually oscillated, sometimes to its great advantage" and is followed byenlightenment refer lines "For, whatever their sense of the strangeness of the country and the thinness of colonial presence, the British colonial staterepresented the great conquering discourse of Enlightenment rationalism, entering India precisely at the moment of its greatestunchecked arrogance." Option 3 is incorrect because of multiple phrases most clear of which is 'arrogance' Enlightenment would have been better Option 4 is clearly incorrect because of use of word 'arrogant rationality'. The rationality

		wasn't arrogant rather ".... Enlightenmentrationalism, entering India precisely at the moment of its greatest unchecked arrogance"
4.	1	refer to lines "Here transformation agendas attack as an external force. This externality is not something that can be casually mentioned andforgotten. It is inscribed on every move, every object, every proposal, every legislative act, each line of causality" and "Theoretically, because modernity was externally introduced, it is explanatorily unhelpful to apply the logical format of the 'transition process' to this pattern of change" Option 4 is completely incorrect as endogenous and endogamous are 2 very different things
5.	4	the change in British colonial policy was induced by resistance to modernity in Indian society goes against thepassage Refer following lines which talk about why modernity was introduced in India "Consequently, the colonial state could not settlesimply for eminence at the cost of its marginality; it began to take initiatives to introduce the logic of modernity into Indiansociety.

		"There was resistance to modernity undoubtedly but that resistance induced change in british colonial policy is incorrect. Option 1 is in consonance with following lines from para2 "historians have forcefully argued that what it was to replace was notlike feudalism"Option 2 is in consonance with last line of passage "What happened was the creation of a degenerate version of capitalism —whatearly dependency theorists called the 'development of underdevelopment'. "Option 3 can be inferred from following lines of para 1 "considered the colonies a massive laboratory of utilitarian or othertheoretical experiments."
6.	1	The main idea that the author expressed over here is that Language is sufficient to bridge cultural barriers. Hence option A is thecorrect option which states a conflicting point with the main point as discussed by author in the passage. Or we can say this wouldbe the major point by the author's crtitics. Nothing has been mentioned about linguistic politics so option B is out of the context. Option C can be inferred from the passage and hence is in consonance with the main idea of the author. Refer to the line" Anindividual who wrestles with a difficult

		language can learn to be more ...." Option D is also irrelevant as author wasn't an Egyptian, so critics gain nothing from this specific point. Refer lines "I had also experienced Egypt and Arabic as an outsider." "What exactly is the dynamic when a man from Missouri ....?"
7.	4	Option A is incorrect as nothing has been mentioned thrroughout the passage about hiring translator rather it isgoing against the viewpoint of the author. Refer lines " An individual who wrestles with a difficult language can learn to be moresympathetic to outsiders and open to different experiences of the world. This learning process—the embarrassments, thefrustrations, the gradual sense of understanding and connection—is invariably transformative. "option B and C are incorrect. Refering to the 3rd para in para 4 " If all of us now stand beside the same river, speaking in ways weall understand, who's looking east and who's looking west? "in para 3 " And both the Chinese and the Egyptians welcomed me because I spoke their languages. My identity as a white malewas far

		less important than my ability to communicate. "Option D is the correct option .Refer to the points he mentioned about the chinese dealers as well as his own real experiences withthe chinese and Egyptian people. Refer lines in para 4 " If all of us now stand beside the same river, speaking in ways we all understand, who's looking east and who's lookingwest? "in para 3 " And both the Chinese and the Egyptians welcomed me because I spoke their languages. My identity as a white malewas far less important than my ability to communicate. ""An individual who wrestles with a difficult language can learn to be more sympathetic to outsiders and open to differentexperiences of the world. This learning process—the embarrassments, the frustrations, the gradual sense of understanding andconnection—is invariably transformative."
8.	3	Option C talks only about language and unlike other options, doesn't talk about people or impact of language onpeople. hence the correct option here Option A can be inferred from the line"after all

		you can always learn....".so this option is incorrect. Option B can be inferred from the line "you are what you speak....your gender". So this option is incorrect. Option D can be inferred from the line" This learning process—the embarrassments, the frustrations, the gradual sense ofunderstanding and connection—is invariably transformative." Only option C cannot be inferred from the given passage as author has not mentioned anything about the inherent ability oflanguage to evolve over time to change a person hence,this is the right answer.
9.	4	Referring to the last and penultimate paragraph it is clear that the author is of the opinion that learning newlanguages actually bridges the gap between different cultures. Refer lines "". in para 4 "If all of us now stand beside the same river, speaking in ways we all understand, who's looking east and who's lookingwest? "in para 3 " And both the Chinese and the Egyptians welcomed me because I spoke their languages. My identity as a white malewas far

		less important than my ability to communicate. "So,option D is the right option. Moreover, nothing has been mentioned about goodwill or Orientalism has disappeared Option 3 is incorrect by virtue of being too generic. Author talks mainly from POV of language.
10.	3	All the given options are valid arguments to be used by companies that digitally scan cultural sites except' Itallows a large corporation to project itself as a protector of culture'. This option shows arrogant and supercilious behavior of thecorporation claiming to be protector of culture. One can only be the promoter of culture. So it is the least likely argument to be used by corporations involved in the digital scanning of cultural sites.
11.	3	The term 'digital colonialism' finds mention in the opening lines of the passage and how critics of the CyArk–Google project describe it is given in the line,' There's another issue for some archaeologists and art historians. CyArk owns thecopyrights of the scans — not the countries where these sites are located. That means the countries need CyArk's permission to usethese images

		for commercial purposes'. It clearly means that countries where the scanned sites are located do not own the scancopyrights. Options 2 and 4 do not find mention in the passage hence eliminated. Option 1 is ambiguous wrt which details aren't shared. Undoubtedly, countries don't own copyrights but wrt details refer followinglines of last para and para 4 respectively" The company says it works closely with authorities during the process, even training local people to help. "" [These] scans . . . are on Google's Arts & Culture site. The digital renditions allow viewers to virtually wander the halls of thetemple, look up-close at paintings and turn the building over, to look up at its chambers. [Google Arts & Culture] works withmuseums and other nonprofits to put high-quality images online."
12.	2	Refer to the lines,' Watrall says this project is just a way for Google to promote Google. "They want to make thismaterial accessible so people will browse it and be filled with wonder by it," he says. "But at its core, it's all about advertisementsand driving traffic." Watrall says these images belong on the site of a

		museum or educational institution, where there is seriousscholarship and a very different mission. . . .' This gives us an idea that Watrall doesn't has any objection if the digitally scanned pictures belong on the site of a museum oreducational institution and his opinion gets invalidated if the option **CyArk uploads its scanned images of archaeological sites onto museum websites** stands true. Just taking down advertisements by Google to promote itself would not invalidate Watrall's claim. Any ban on CyArk scanning archeological sites located in other countries would certainly not prevent promotion by Google. CyArk does not own the copyright on scanned images of archaeological sites would not prevent using it for commercial purposes.
13.	1	Refer line in the last paragraph,'it's the latest example of a Western nation appropriating a foreign culture, acenturies-long battle'. This line clearly helps us to understand that Erin Thompson blames CyArk of misappropriating foreignculture. Seizing means to snatch or to have or to receive possession of something So Dr. Thompson's view of CyArk owning the

		copyright of its digital scans of archaeological sites is akin to only one option i.e. theseizing of ancient Egyptian artefacts by a Western museum. Illegal downloading of content from the internet does not make one the owner of it. Digital platforms capturing users' data for market research is not bringing the relationship asked. Tourists uploading photos of monuments onto social media is not same as being the owner of it.
14.	4	By reading views of Ethan Watrall in the passage "Ethan Watrall, an archaeologist, professor at Michigan State University and a member of the Society for American Archaeology, says **he's not comfortable with the arrangement between CyArk and Google**. Watrall says this project is just a way forGoogle to promote Google. "They want to make this material accessible so people will browse it and be filled with wonder by it,"he says. "But at its core, it's all about advertisements and driving traffic." Watrall says these images belong on the site of amuseum or educational institution, where there is serious scholarship and a very different mission. . . ."

		Option 4 Critical about the links between a non-profit (alluding to CyArk) and a commercial tech platform(alluding to Google) fordistributing archaeological images properly characterise the views of Watrall mentioned in the passage. Option 1 Though Google's traffic would increase as a result of this project but it is nowhere mentioned that both Google andCyArk are using the images as a marketing tool hence rejected. option 2 Dismissive of laypeople's access to specialist images of archaeological and cultural sites is not mentioned. Option 3 Watrall is against the intention and not technology itself, so opposed to the use of digital technology in archaeologicaland cultural sites in developing countries is eliminated.
15.	1	Refer the lines in 2nd paragraph, In his 1985 article, Calthorpe made a statement that still jars with most people: "The city is the **most environmentally benignform of human settlement.** Each city dweller consumes less land, less energy, less water, and produces less pollution than his counter part in settlements of lower densities."The term"still jars" means something that is against or what

		disturbs most of the people. So the answer option should be one which is opposite to the views of Calthorpe because views of people and Calthorpe do notmatch and the option is **people do not consider cities to be eco-friendly places.** Options 2 and 3 don't talk about environment so rejected. Another option, option 4, which is close is people consider cities to be very crowded and polluted which is half true i.e. only aboutpollution (nothing about crowded cities) is mentioned, so eliminated.
16.	2	In this question we have to find the odd one i.e. the option which cannot be considered as reason to cities aregood places to live in for all . Offer employment opportunities is mentioned in the 2nd paragraph, so it can be inferred from the passage and hence rejected. Help prevent destruction of the environment can be inferred from second last paragraph ([T]he nationally subsidised city ofManaus in northern Brazil “answers the question” of how to stop deforestation) and therefore eliminated. Contribute to the cultural transformation of residents can be properly inferred from last paragraph

		and hence eliminated. It seems that the option have suburban areas as well as office areas can also be inferred from last portion of the passage but itis not the reason author mentions to consider cities as good places to live. So it is the right answer.
17.	3	Refer to the second last paragraph of the passage where the term Manaus has been mentioned . From the paragraph lines we understand that Manaus were the community of people involved in deforestation have changed (bystopping deforestation) and prospered by making mobile phones and televisions. Hence the reason for giving example of Manaus was to explain how urban areas help the environment To explain where cities source their labour for factories is not mentioned in the passage. To describe the infrastructure efficiencies of living in a city is the positive aspect of being in a city and not the reason for citingexample of Manaus To promote cities as employment hubs for people is another positive aspect of being in a city and not the reason for citing exampleof Manaus

18.	3	In this question we have to select the option which will not fit as an adequate reason for squatter cities being environment friendly. All the mentioned options would help keep the squatter cities environment friendly (i.e. sorting out garbage, recycling the materialand energy efficient transportation) except keeping the streets clean which is least related to environment. Also because this would possible mean that somewhere the waste has to be dumped which means a negative impact on the surrounding environment.
19.	2	It is a critical reasoning based question wherein we have to weaken the author's argument regarding thegreenness of the cities. The options concerning the increase in the incidence of crime and increase in the cost of utilities would be easily eliminatedbecause the context of argument is greenness and not crime or cost of utilities. Similarly rapid spread of diseases in slum areas is also eliminated on the ground that the diseases would impact the population i.e.persons residing in those slums; it is nowhere connected to the greenness of the city.

		We are left with only one option and it is a valid point that weakens the author's argument regarding the greenness of city because **increase in the level of carbon-di-oxide and global warming would definitely impact** the verdancy in a negativemanner.
20.	4	The first line of the fourth paragraph mentions "long pedigree". The following line talks of how it has already beentried in the past in Britain. So, "is not a new idea and has been tried in the past" is the answer.
21.	1	The option "high staff losses, as people may not be prepared to move to smaller towns" is referred to as a reasonfor why relocating government agencies has not always been a success in the last line of the fourth paragraph. Similarly, theoption "the difficulty of attracting talented, well-skilled people in more remote areas" is referred to as a reason in the penultimateparagraph in the lines " Pick small, poor towns, and areas of high unemployment get new jobs, but it is hard to attract the most qualified workers". And the option " increased avenues of corruption away from the capital city" is referred to as a reason in the last paragraph. The option " a rise in pollution levels and

		congestion in the new locations" is not mentioned anywhere and hence is the answer
22.	1	The penultimate paragraph "The dilemma is obvious. **Pick** small, poor towns, and areas of high unemployment get new jobs, but it is hard to attract the mostqualified workers; **opt for larger cities** with infrastructure and better-qualified residents, and the country's most deprived areassee little benefit. . . ."helps us identify " relocating government agencies to boost growth in remote areas with poor amenities or to relatively larger citieswith good amenities." as the answer.Option 4 "**keeping** government agencies in the **largest** city with good infrastructure **or moving them** to a remote area with fewamenities." is incorrect as penultimate para talks about which ones to relocate to. **Keeping** govt agencies in largest city isn't one ofthe 2 options discussed in the para
23.	4	Refer to the second paragraph of the passage. The lines " Wonks in the sticks will be inspired by new ideas thatwalled-off capitals cannot conjure up." imply that the people who support decentralising central government functions are likely to agree with the option "Policy makers may benefit from fresh thinking in a new environment".

		Similarly, the lines "Autonomous regulators perform best far from the pressure and lobbying of the big city." imply the agreementwith the option " More independence could be enjoyed by regulatory bodies located away from political centres". For the agreement with the option " It reduces expenses as infrastructure costs and salaries are lower in smaller cities", refer to thesecond half of the fourth paragraph. The option " It could weaken the nexus between bureaucrats and media in the capital" is not mentioned and hence should be themost appropriate answer.
24.	2	The second line of the passage determines " to promote their trading interests" as the answer.
25.	4132	The opener in this case will be 4 as it introduces the idea of representation of 'clock - time ' with respect to 'time ismoney' perspective'.After this 1 as there is clear link 'this representation'. 3 is explaining that actually caring time is often more focussed on clock though clock time has been seen as a masculine artefact.Hence 3 questions stts concept of clock time as masculine artefact. 2 concludes and answers the question being

		raised in 3
26.	3421	The opening sentence is 3 as it introduces the topic of the discussion i.e.' balance of nature' and its perception asper the author.After this 4 will come as it defines this 'balance of nature as 'telelogy'. After this 2 will come as 'parts' in 4 can belinked clearly with 'parts' in 2. 1 will conclude the sequence.
27.	2143	Sentence 2 is an opener as it clearly defines and introduces 'atonality'. 1 & 4 form a mandatory pair as 4 is in contrast with 1. 'your tune may change' in 3 implies that your opinion may change. so the opinion i.e stt 1 has to come before 3 though notnecessarily immediately precede it. hence 143 The sequence is concluded by 3.
28.	4	The passage says that the language evolved over a period of time, and it is a complex process based on featuresof cognition suc as memory. This has been best captured by option 4. Option 1 misses the cognition and role of the memory. Option 2 is partial in terms of summarizing the passage. Option 3 touches that this feature is seen only in humans and not inother species.
29.	1	After reading all the sentences , a clear pair that emerges is 2-5

		2-5 'speaking about yourself in the third person' is the change being talked about in 5 ' this small change' 'It' in 2 refers to 'research' in 3 Hence 3-2-5 3 talks about rumination which is introduced in 4 Hence 4325 we find that context is about ways of self realization' and it says that ' Simple rumination' is not the way to achieve it. Then 3describes the drawback of this process. 'It' in 2 refers to 'research' in 3 Hence 3-2 After this 5 highlights the benefit of 'ancientmethod i.e. "illeism' . The sequence of these four sentences is 4325. 1 is odd one out.
30.	3	The passage mentions that social movement organizations struggle to achieve critical mass. Also, that the organizations with hybrid identities are able are able to mobilize individuals with different points of view. Tostate this point, the author gives example of individuals with past involvement in non-anti-war movements and those related tothe antiwar movement are likely to join hybrid organizations. Hence, "Organizations with hybrid identities are able to mobilizeindividuals with different points of view" captures the essence of the passage the best out of the given options and should be

		theanswer. The other three options talk only of a part of the passage and hence cannot be a better summary.
31.	2	After reading all the sentences , it is seen that context is about ' inference occurs in many single panel comics.' Sothe opening sentence of the discussion is 1. 'inferences' in 1 can be linked with ' requires you to imagine'. 5 further tells 'how it goes'. stts 3 and 5 both talk about the panel being shown. As funniest not has been shown so to get the joke'you actually have to figure out' something regarding the missing panel(s). The plural panels being talked about in 4 '**These"** areintroduced in their plural form in 5 **"a series of panels**" The sequence becomes '1354' and sentence 2 is misfit here as it doesn't fit in the para
32.	2431	After reading all the sentences, we find that topic of the discussion is on 'Adaptive behaviour' and on what factorsdoes it depend'. So sentence 2 has to be the opener. The word 'equivalent' in 2 can be linked with same word in 4. How wecognitively economize(Stt 2) is by categorizing(Stt4) How this 'categorization' is percieved is highlighted

		by 3. The information is not arbitary(Stt3) because Living things typically exhibit correlational structure(stt1).. Hence the sequence is2431. In the source article, stt pairs 24 and 31 are from different paras though the paras are in continuity
33.	1	The passage highlights following points: 1. open-plan offices and cubicles were invented by architects and designers who thought that to break down the social walls thatdivide people, you had to break down the real walls, too. 2. Modernist architects saw walls and rooms as downright fascist. 3. But companies took up their idea less out of a democratic ideology than a desire to pack in as many workers as they could. theessence has been well captured by option 1. Option 2 is incorrect as nowhere does the author opine that Wall-free office spaces could have worked out the way theirutopian inventors intended Option 3 is incorrect as it's not stated that companies don't believe in democratic ideology which the designers believed in, ratherwhat mattered more to companies was

		cost cutting which open-planned offices allowed for. Option 4 is incorrect as cubicles have been talked about in line 1 of para 2, so cubicles weren't a soln which the option representsthem as
34.	2	After reading all the sentences , we find that context is about plastic pollution in seas and how it is dangerous formarine creatures. The opening sentence is therefore 4. After this 1 will come as it tells 'why it is problematic'. 5 further explains itand 3 is the extension of 5. The coherent sequence thus become 4153. 2 is odd one out as it tells the ' numerical proportion ofocean plastic falls' , which is not discussed in other sentences.
35 - 38.	The given triangles when decoded give following table	

	Revenue			Cost		
Year	Electronic	Clothing	Produce	Electronic	Clothing	Produce
2016	50%	20%	30%	30%	30%	40%
2017	30%	30%	40%	40%	30%	30%
2018	20%	40%	40%	30%	20%	50%

As Profit is computed as (Revenue – Cost) and Percentage Profit as Profit/Cost

It is known that

1. The percentage profit for the store in 2016 was 100%.it means that half of revenue is cost and half the revenue is profit. Now let revenue in 2016 is **100** so cost in 2016 is **50.**

2.store's revenue doubled from 2016 to 2017, and its cost doubled from 2016 to 2018.so revenue in 2107 is 200 and cost in 2108 is 150.

3.There was no profit from the Electronics department in 2017.from this we can find the cost in 2017 shown below:

No profit means revenue and cost are equal . as revenue in the Electronics department in 2017 is 30% of 200 which is equal to cost in the Electronics department in 2017 which further is40% of total cost.

40% of total cost in 2017=30% of 200 =60

So total cost in 2017= $\frac{60}{40\%}=150$

4. In 2018, the revenue from the Clothing department was the same as the cost incurred in the Produce department

from this we can find the total revenue in 2018 as shown below

as the cost incurred in the Produce department in 2018 is 50% of 100 which is equal to revenue from

the Clothing department in2018which further is 40% of total revenue.

40% of total revenue in 2018=50% of 100 =50

So total revenue in 2018 = $\frac{50}{40\%}=125$

Now whole solution is summarized as below:

Revenue					Cost			
Total	year	Electronics	Clothing	Produce	Total	Electronic	Clothing	Produce
100	2016	50%	20%	30%	50	30%	30%	40%
200	2017	30%	30%	40%	150	40%	30%	30%
125	2018	20%	40%	40%	100	30%	20%	50%

35.	25	Total revenue in 2018 is 125 and total cost =100. Hence % profit= $\frac{(125-100)}{100}\times 100=25\%$
36.	3	Required ratio = 40% of 200 : 40% of 125 = 80 : 50 = 8 : 5
37.	70	Total profit in 2016=100-50=50 Profit in 2016 from Electronics dept=50% of 100-30% of 50=50-15=35 Hence required %= $\frac{35}{50}\times 100=70\%$
38.	1	profit percentages of the store in 2017 = $\frac{200-150}{150}\times 100=\frac{50}{150}\times 100=33.33\%$ profit percentages of the store in 2018 =

$\frac{125-100}{100}\times 100=\frac{25}{150}\times 100=25\%$

hence required difference=33.33%-25%=8.3

39 - 42.

Now there were two important points that had to be kept in mind while solving this block were that

(i) as it is known that the average amount of money (in rupees) kept in the nine pouches in any column or in any row is an integer. Hence the sum of nine pouches in any row or column should be a multiple of 9.

(ii) in any of nine slots of 3 × 3 grid minimum and maximum amount should be kept in mind while placing the amount in third column.

The minimum and maximum amounts of money (in rupees) among the three pouches in each of the nine slots are given in the table below

	Column 1	**Column 2**	**Column 3**
Row 1	(2, 4)	(6, 8)	(1, 3)
Row 2	(3, 5)	(1, 1)	(6, 20)
Row 3	(1, 2)	(1, 2)	(2, 5)

It is also known that the total amount of money kept in the three pouches in the first column of the third row is Rs. 4.so amount of money kept in the third pouch should have been 1 and also the maximum and minimum amount of money kept in second column of the second row is(1,1) so amount of money kept in the third pouch here should also

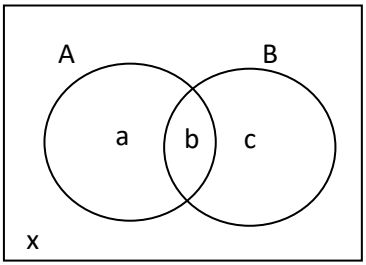
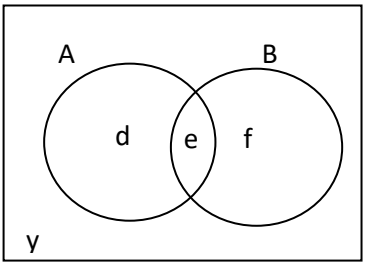
be 1.

Now further money in the first column in seven of nine pouches is 6+8+4=18 .also no pouch is empty and sum of all in pouches any column or row is a multiple of 9 . so in remaining two pouches in colomn 1 the sum should be 9 making total sum as 27 in first colomn. (we cannot make sum 36 or next multiple of 9 as it will violate max and min range given) .so third pouch in colomn 1 of row 1 is 4 and colomn 2 of row 5.

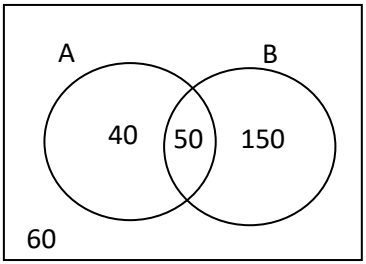
Further moving in same way and keeping all condition in mind we get the following solution

	Column 1	**Column 2**	**Column 3**	**total**
Row 1	(2, 4) ,4 **Sum=2+4+4 =10**	(6, 8),6 **Sum=6+8 +6=20**	(1, 3),2 **Sum=1+3+2=6**	**10+20+ 6=36**
Row 2	(3, 5),5 **Sum=3+5+5 =13**	(1, 1),1 **Sum=1+1 +1=3**	(6, 20),12 **Sum=6+ 20+12=38**	**13+3+3 8=54**
Row 3	(1, 2),1 **Sum=1+2+1 =4**	(1, 2),1 **Sum=1+2 +1=4**	(2, 5),3 **Sum=2+5+3=1 0**	**4+4+10 =18**
total	**10+13+6=27**	**20+3+4=2 7**	**6+38+10=54**	

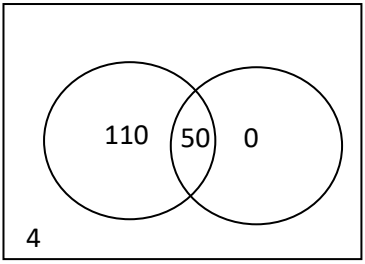
39.	13	As shown the required sum is 13
40.	8	As shown 8 pouches contain exactly one coin

41.	2	average amount (in rupees) of its three pouches will be an integer in the slot in which sum of amount is multiple of 3 which is there in two slots i.e.colomn 3 of row 1where sum is 6 and colomn two of row two where sum is 3
42.	3	As shown above, the number of slots for which the total amount in its three pouches strictly exceeds Rs. 10 is 3
43 - 46.		 Ragini (300)  Sunita (200) From second point we have d + e = 160 From third point we have a + b = 90 --(2)

From fourth point we have e + f = 50 --(3)
From fifth point we have 40% of (A & not B) = Ragini
⇒ 60% of 9A & not B) = Sunita
⇒ d + y = 1-59a + x) ----(4)
From point six, we have, f = 0
From point seven, we have x = 20% of 300 = 60
Now as f = 0, (3) ⇒ e = 50
∴ (1) ⇒ d = 110
⇒ y = 200 - (110 + 50) = 40
(4) ⇒ 150 = 1.5 (a + 60) ⇒ a + 60 = 100 ⇒ a = 40
(2) ⇒ b = 50
∴ c = 300 - (40 + 50 + 60) = 150
So we have



Ragini (300)



Sunita (200)

43. Required %age = $\frac{160}{250} \times 100 = 64\%$

44. Students who did not support A = 150 + 60 + 40 = 250

$\therefore$ required %age = $\frac{210}{250} \times 100 = 84\%$

45. Students who supported both proposals = 50 + 50 = 100

$\therefore$ required %age = $\frac{50}{100} \times 100 = 50\%$

46. 150 students supported proposal B only supported Ragini

47 - 50. After analyzing the information following teams are made

	Members	**Languages spoken**
Team 1	Robert, Paula, Terence	A abic, French, Chinese, English
Team 2	Paula, Sally, Terence	French, Basque, Chinese, English
Team 3	Quentin, Paula, Sally	Dutch, Basque, Chinese, English

47.	4	As shown above Quentin is not a member of Team 2.
48.	4	As Shown above among the given four people Sally is a part of exactly two teams.
49.	1	AS Shown above Paula is a member of all teams
50.	2	AS Shown above Apart from Chinese and English ,Arabic and French languages are spoken by Team 1.
51.	**4**	Maximum number of patients can be catered on single day when The queue is never empty and all doctors work to full capacity. The clinic is open from 9 a.m. to 11.30 a.m i.e. for 150 minutes every day. Maximum number of patients that can be seen by Dr. Ben are 150/10=15 Maximum number of patients that can be seen by Dr. Kane are 150/15=10 Maximum number of patients that can be seen by Dr. Dr. Wayne are 150/25=6 So the maximum number of patients that the clinic can cater to on any single day are=15+10+6=31
52.	4	The queue is never empty on one particular Saturday it means all the doctor are working to their full capacity.

		(i) Maximum number of patients that can be seen by Dr. Ben are 150/10=15. As charges of of Dr. Ben are 100/- So maximum amount in consultation charges earned by Dr. Ben are 15 × 100 =**1500/-** **(ii)** Maximum number of patients that can be seen by Dr. Kane are 150/15=10 As charges of of Dr. Kane are 200/- So maximum amount in consultation charges earned by Dr. Kane are 10 × 200=**2000/-** **(iii)**Maximum number of patients that can be seen by Dr. Dr. Wayne are 150/25=6 As charges of of Dr. Wayne are 300/- So maximum amount in consultation charges earned by Dr. Ben are 6 × 300 =**1800/-** Hence among three doctors Dr. Kane would earn the maximum amount in consultation charges on Saturday.
53.	1	Mr. Singh who is having token no 13 will be in clinic for the maximum duration on the on which he will be attended by Dr. Wayne The movement of patients having token number number 1-13 on each given day is shown below

Movement of patients having token number 1-13 on **Monday**					
Ben		Kane		Wayne	
Token no	Time	Token no	Time	Token no	Time
1	9:00-9:10	2	9:00-9:15	3	9:00-9:25
4	9:10-9:20	5	9:15-9:30	7	9:25-9:50
6	9:20-9:30				
8.	9:30-9:40	9	9:30-9:45		
10.	9:40-9:50	11	9:45:10:00		
12	9:50-10:00			**13**	**9:50-10:15**

Movement of patients having token number 1-13 on **Wednesday**					
Wayne		Ben		Kane	
Token no	Time	Token no	Time	Token no	Time
1	9:00-9:25	2	9:00-9:10	3	9:00-9:15
		4	9:10-9:20	5	9:15-9:30
		6	9:20:9:30		
7	9:25:9:50	8	9:30-9:40	9	9:30-9;45
		10	9:40-9:50	11	9:45-10;00

		12	9:50-10:15	**13**	**9:50-10:00**		

movement of patients having token number 1-13 on **Friday**					
Kane		Wayne		Ben	
Token no	Time	Token no	Time	Token no	Time
1	9:00-9:15	2	9:00-9:25	3	9:00-9:10
5	9:15-9:30			4	9:10:9:20
				6	9:20-9:30
		7	9:25-9:50		
8	9:30-9:45			9	9:30-9:40
				10	9:40-9:50
11	9:45:10:00	12	9:50 -10:15	**13**	**9:50-10;00**

As shown above Mr. Singh will be in clinic for maximum duration on **Monday**

54. 1

movement on Thursday as per condition					
Wayne		Ben		Kane	
Token no	Time	Token no	Time	Token no	Time
1	9:00-9:25	2	9:00-9:10		

			3	9:10-9:20	4	9:15-9:30
	5	9:30-9:55	6	9:30-9:40		
			7	9:45-9:55	8	9:45-10:00
	9	**10:00 - 10:25**	**10**	**10:00 - 10:10**		

As shown above token number 11,12 will have same movement as of token number 3 and 4 and the same sequence will follow between 10:11 and between 11:0-11;30.
Hence there is no time duration in which all the three doctors are simultaneously free.

55. 4

There are seven states(Mizoram, Sikkim, Maharashtra ,Goa, Arunachal, Kerala and Meghalaya) which are under Heavy Monsoon State' as per given criterion out of which three (Arunachal, Kerala and Meghalaya) have a negative deviation from respective LPA.

Hence Required%= $\frac{3}{7}\times 100 = 42.86\%$

56. 4

There are nine states(Gujarat , Karnataka, Rajasthan , MP, Assam, WN, Jharkhand, Delhi and Manipur) which are under 'Low Monsoon State' as per given criterion and their respective 'deviation from LPA' are

		30,20,15,10,**-10**,-30,-35,-40 and -60 res. Hence required median is -10.
57.	2	states that have actual rainfall of 600 mm or less in 2019 and have a negative deviation from LPA are Assam, WB, Jharkhand, Delhi and Manipur and their respective rainfall are 600,600,400,300 and 400 Hence Required average = $\frac{600+600+400+300+400}{5}=\frac{2300}{5}=460\text{mm}$
58.	1	
59 - 62.	If we broadly see the block two important tasks are to be done **(i)**to find the number of questions in each categories of 5 marks ,10 marks and 15 marks For both MT and ET **(i)** To allot each question number the faculty that has made that question for both ET and MT As minimum the number of questions in each categories of 5 marks ,10 marks and 15 marks for both MT and ET are given. Also ET contained more questions than MT. Now considering all these facts total number of questions categories wise for both MT and ET are given below: **ET**	

	Number of questions	Marks for each question	Total marks
	8	5	40
	3	10	30
	2	15	30
Total	**13**		100

For MT there are two possible cases

Case1

MT			
	Number of questions	Marks for each question	Total marks
	5	5	25
	3	10	30
	3	15	45
Total	**11**		100

Case2

MT			
	Number of questions	Marks for each question	Total marks
	4	5	20
	5	10	50
	2	15	30
Total	**11**		100

Further it is given that Annie prepared one question for MT. Every other faculty member prepared more than one questions for MT ,Also considering MT and ET together, each faculty member prepared the

same number of questions
Total number of questions are 13+11=24 so each faculty made 4 questions. So keeping in mind all this fact following table gives us the number of question made by each faculty in MT and ET are

	MT	ET
Annie	1	3
Beti	2	2
Chetan	2	2
Dave	2	2
Esha	2	2
Fakir	2	2
	11	**13**

Now the information given is "***All questions prepared by a faculty member appeared consecutively in MT as well as ET***."
This information will help us to narrow down the cases. Fakir prepared the first question of MT so he will also solve the second one
Chetan prepared the third question in both MT and ET. So considering MT he will solve the forth one. Annie prepared the fifth question for both MT and ET. For MT, this question carried 5 marks.it means ist five questions in MT are of 5 marks this eliminates the second possible case for MT. now

filling the faculty name consecutively we come to the conclusion as follws:

MT	
Q no	faculty
1	Fakir
2	Fakir
3	Chetan
4	Chetan
5	Annie
6	Beti
7	Beti
8	Esha
9	Esha
10	Dave
11	Dave

ET	
Q no	faculty
1	Dave
2	Dave
3	Chetan
4	Chetan
5	Annie
6	Annie
7	Annie
8	Esha
9	Esha
10	Beti
11	Beti
12	Fakir
13	Fakir

59.	3	The second question in ET was prepared by Dave
60.	1	As shown above ,5-mark questions were there in MT and ET combined were 8+5=13
61.	3	Only Dave, Esha and Fakir prepared 15-mark questions for MT and ET
62.	3	Among given options Tenth question was prepared by Beti in ET

63 - 66.

If we broadly see the block two important tasks are to be done

(i) to find the break up of points of each player after round 6 and between round 7-10

(ii) To allot each match its Ist , second and third winner

Round 1-6

Player No.	Player Name	Points after Round 6	Possible break up 1	Possible break up 2	Possible break up 3
1	Amita	8	**7+1**		
2	Bala	2	1+1		
3	Chen	3	3	1+1+1	
4	David	6	3+3	3+1+1+1	
5	Eric	3	3	1+1+1	
6	Fatima	10	7+3	3+3+3+1	7+1+1+1
7	Gordon	17	7+7+3	7+3+3+1	
8	Hansa	1	1		
9	Ikea	2	1+1		
10	Joshin	14	7+7		

Player No.	Player Name	Points after Round 6	Final breakup
1	Amita	8	**7+1**
2	Bala	2	1+1
3	Chen	3	3
4	David	6	3+3
5	Eric	3	3
6	Fatima	10	7+3

7	Gordon	17	7+7+3
8	Hansa	1	1
9	Ikea	2	1+1
10	Joshin	14	7+7

now after round 6 we need six 7's, six 3's and six 1's as in each round there will one first ,one second and one seven position.to balance that we need to reject other possible breakups of Chen, David. Eric, Fatima, Gordon(shown yellow).now final break up of scores for each playrer after round 6 is shown in table given below

The next task is to now find the top three players of each round. As we know that

Amita will be playing in first round and sixth round . so her scores 7 and 1 could be only in these rounds. As Joshin has scored two 7.s and in first 6 round he is playing in nly 5th band 6th round . so both 7 scored by him are in these two rounds. So score 7 scored by Amita will be for round 1 . proceeding in this way we will reach the

Round	Ist position **(7)**	IInd position **(3)**	III rd position **(1)**
1	Amita	Chen/ David	Bala
2	Gordon	Chen/ David	Bala
3	Fatima	Eric	Hansa
4	Gordon	David	Ikea

5	Joshin	Fatima	Ikea
6	Joshin	Gordon	Amita

Following conclusion for round **1-6**

Now we will do the same process for round 7-10

Round 7-10

Player No.	Player Name	Points scored for round 7-10	Possible break up 1	Possible break up 2
1	Amita	10	**7+3**	3+3+3+1
2	Bala	3	3	1+1+1
3	Chen	3	1+1+1	3
4	David	0	7	3+3+1
5	Eric	7	0	0
6	Fatima	0	0	0
7	Gordon	0	3	1+1+1
8	Hansa	3	1	
9	Ikea	15	7+7+1	
10	Joshin	3	3	1+1+1

now after round 7-10 we need four 7's, four 3's and four 1's as in each round there will one first ,one second and one seven position.

Further it is given that

Only two players scored in three consecutive rounds. One of them was Chen. No other player scored in any two consecutive rounds. So apart from Chen , other one should be Ikea as she is having a option of three scores only so she will have to be settled down with7+7+1. So we will get the following table

Player No.	Player Name	Points after Round 7-10	Final breakup
1	Amita	10	**7+3**
2	Bala	3	3
3	Chen	3	1+1+1
4	David	0	0
5	Eric	7	7
6	Fatima	0	0
7	Gordon	0	0
8	Hansa	3	3
9	Ikea	15	7+7+1
10	Joshin	3	3

As Only two players scored in three consecutive rounds in this stage and they are Chen and Ikea having scores 1,1,1 and 7,7 and 1. Further Ikea which is not in 10^{th} round will have scores in 7^{th} 8^{th} and 9^{th} round and chen would have scored in 8^{th} 9^{th} and 10^{th} round. Proceeding in this way we get the following table for round 7-10

Round	Ist position **(7)**	IInd position **(3)**	III rd position **(1)**
7	Amita	Joshin	Ikea
8	Ikea	Bala/Hansa	Chen
9	Ikea	Bala/Hansa	Chen
10	Eric	Amita	Chen

63. 3

As solved above

Final conclusion after round 6 is

Round	Ist position	IInd	III rd

		<table><tr><td></td><td>(7)</td><td>position (3)</td><td>position (1)</td></tr><tr><td>1</td><td>Amita</td><td>Chen/ David</td><td>Bala</td></tr><tr><td>2</td><td>Gordon</td><td>Chen/ David</td><td>Bala</td></tr><tr><td>3</td><td>Fatima</td><td>Eric</td><td>Hansa</td></tr><tr><td>4</td><td>Gordon</td><td>David</td><td>Ikea</td></tr><tr><td>5</td><td>Joshin</td><td>Fatima</td><td>Ikea</td></tr><tr><td>6</td><td>Joshin</td><td>Gordon</td><td>Amita</td></tr></table> As shown above the scores of Chen, David, and Eric respectively after Round 3 are 3, 3, 3
64.	3	As shown in table last three positions after Round 4 are of Hansa, Ikea, Joshin with scores 1,1 and 0
65.	1	As shown Ikea scored points in five rounds which was maximum in number.
66.	1	As shown Amita, Chen, Eric scored points in the last round.
67.	3	Vessel A Contains 50 gm of salt and 450 ml water vessel B contains 110 gm of salt and 390 ml water vessel C contains 160 gm of salt & 340 ml water After the transfer of 100 ml from A to B A will contain 360 ml water & 40 gm salt and B will contain 120 gm of salt and 480 ml water

<table>
<tr><td></td><td></td><td>which makes B having 20% salt strength. After the transfer of 100 ml from B to C, C will Contain 180 gm of salt & 420 ml of water making it have salt strength = 30% After the final transfer of 100 ml from C to A, A will contain 70 gm of salt and 430 ml water making the salt strength in A = 14%
Alternate method:-
<table>
<tr><td>Vessel</td><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Salt Strength</td><td>10%</td><td>22%</td><td>32%</td></tr>
<tr><td>After 100 ml transfer from A to B</td><td>10% (400 ml total)</td><td>$\frac{10+22\times5}{6}$ = 20%</td><td>32%</td></tr>
<tr><td>After 100 ml Transfer from B to C</td><td>10% (400 ml Total)</td><td></td><td>$\frac{20+5\times32}{6}$ = 30%</td></tr>
<tr><td>After 100 ml transfer from C to A</td><td>$\frac{10\times4+30}{5}$ = 14%</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>68.</td><td>2</td><td>$7a = -b \Rightarrow b^2 = 49^2$
$12a^2 = c$
So, $b^2 + c = 61\ a^2$
So, option ÷ 61 has to be a perfect square .
Trying options,
(i) $\frac{3721}{61}$ = 61 which is not a perfect square
(ii) $\frac{549}{61}$ = 9 which is a perfect square</td></tr>
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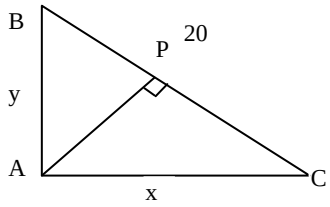
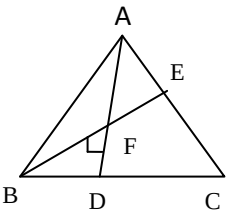
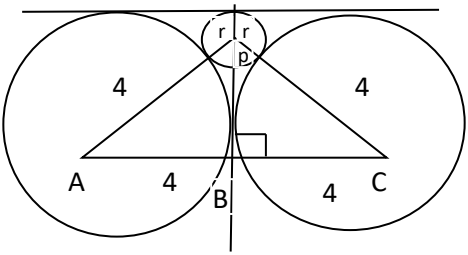
		(iii) Not a multiple of 61 (iv) $\frac{427}{61}$ = 7 which is not a perfect square
69.	3	Let the circumference = 100m. Let the meeting point is X. The Distance P to X clockwise is 60 m and distance P to X anti-clockwise is 40 m. A Travelled 40 m in 12 min, so he can cover 60 m in $\frac{12}{40}\times 60 = 18$ min. Speeds of A and B are in the ratio 6:4 (Because A and B covered 60 m & 40 m respectively in the same time so their speeds are in the ratio 6:4) So the time taken by B to cover 60 m = $\frac{6}{4}\times 18 = 27$ min., So 10:27 am is the answer.
70.	2	The equilateral triangle has side 20 cm so its height = $\sqrt{3}\times 20/2$ cm. Let the height of the pyramid = x cm then, 10 cm, x cm and $\sqrt{3}\times 20/2$ cm are Pythagoras triplets with hypotenuse = $\sqrt{3}\times 20/2$ cm $\Rightarrow x^2 + 100 = 300$ $\Rightarrow x = 10\sqrt{2}$
71.	3	$\frac{n^2+7n+12}{n^2-n-12}$ $\frac{(n+4)(n+3)}{(n-4)(n+3)} = \frac{n+4}{n-4}$

		Taking the largest option 16, we get $\frac{20}{12}$ which in not an integer. Next, we can try n = 12 which gives $\frac{16}{8}$ = 2 which in an integer.
72.	3	X^2-4x-$\log_2$ A = 0 For real and distinct roots the quadratic $ax^2+bx+c = 0$ must have, b^2-4a c > 0 $\Rightarrow 16 + 4 \log_2 A > 0$ $\Rightarrow \log_2 A > - 4$ $\Rightarrow A > 2^{-4}$ $\Rightarrow A > \frac{1}{16}$
73.	1	Profit from six of the bicycles = 6 × 25 % of x (where x is the purchase price of a bicycle) Loss from four of the bicycles = 4 × 25% of x Total net profit = 2000 = 6 × 25% of x – 4 × 25 % of x $\Rightarrow 1.5 x – x = 2000$ $\Rightarrow x = 4000$
74.	3	Since exactly 20 integers are such that they are ≤ 5, the remaining 10 integers have to be > 5. So the highest possible value of the average of those 20 integers has to be less than 5 otherwise the combined average of all 30 integers will exceed 5. So maximum value as per options is 4.5

75.	12	f (1×2) = f(1) f(2) f (2) = f(1) f(2) ⇒ f (1) = 1 Also, f(2) > f(1) Let f(2) = a, f(3)=b. f(4) = f(2) × f(2) = a^2 f(6) = f(2) × f(3) = ab f(24) = a^3 b = 54 ⇒ a = 3, b=2 So f (18) = f(3) ×f(6) = ab^2 = 12.
76.	2	a_1 = 1 $a_1 - a_2 = 2 \Rightarrow a_2 = -1$ $a_1 - a_2 + a_3 = 3 \Rightarrow a_3 = 1$ $a_1 - a_2 + a_3 - a_4 = 4 \Rightarrow a_4 = -1$ Similarly, a_5 =1, a_6= -1, a_7= 1,..... $a_{odd} = 1$, $a_{even} = -1$ $a_{51}+a_{52}+$_____+ a_{1023} 1 – 1 + 1 – 1 _____+ 1 =1
77.	1	Let the scores of Rama, Mohan and Anjali are R,M and A respectively. R = $\frac{1}{12}$ (M+A) After the score of each of them increased by 6, the ratio of their scores are 11:10:3 fo Anjali, Mohan & Rama respectively. Let their scores are 11x, 10x, 3x. Their original scores before the increase were 11x-6, 10x-6, 3x-6 respectively

		So 3x-6 = $\frac{1}{12}$ (11x-6 + 10x -6) 3x – 6 = $\frac{1}{12}$ (21x -12) ⇒ x = 4 Anjali's score exceeded Rama's score by (11x-6)-(3x-6)=8x=32
78.	3	Since cyclist takes one hour to reach from A to B and 45 motor cycles starting from 10:01,10:02,---------,10:45 am leave from A to reach B by 11 am, So the last motorcycle takes 15 min to reach from A to B. Hence every motorcycle takes 15 min to reach from A to B. If the cyclist doubles his speed then he will reach B at 10:30 am and hence the last motorcyclist who will reach B at 10:30 am has to leave from A at 10:15. Therefore 15 motorcycles will reach B in the given time
79.	1	 $\frac{1}{2}$ xy = $\frac{1}{2}$ × 20 × AP ⇒ AP = $\frac{xy}{20}$

		For the maximum possible value of AP, x =y=$10\sqrt{2}$ ⇒ maximum (in cm) AP = $\frac{(10\sqrt{2})\ (10\sqrt{2})}{20} = 10$
80.	2	 BF = 6 cm, FE = 3cm, AF = 8cm, FD = 4 cm Area of triangle ABE= $\frac{1}{2}$ × BE × AF = $\frac{1}{2}$ × 9 × 8 = 36 cm^2 So area of triangle ABC = 72 cm^2
81.	4	105 = $n^2 - m^2$ = (n-m) (n+m) $3^1 \times 7^1 \times 5^1$ = (n-m) (n+m) Number of factors of 105 = (1+1) (1+1) (1+1) = 8 So possible pairs for (n-m) & (n+m) are four
82.	3	Let 2^{3x} = y ⇒ $y^2 + 2^2 y - 21 = 0$ ⇒ $y^2+4y-21=0$ ⇒ y = 3, -7. The only possible value is y = 3 ⇒ $2^{3x} = 3$ ⇒ $3x = \log_2 3$

		$\Rightarrow x = \frac{\log_2 3}{3}$
83.	4	$\sqrt{\log e \frac{4x - x^2}{3}}$ is a real number If $\frac{4x - x^2}{3} \geq 1$ (because log a ≥ 0 for a ≥ 1) $4x - x^2 \geq 1$ $\Rightarrow x^2 - 4x + 3 \leq 0$ $\Rightarrow (x-3)(x-1) \leq 0$ Which is true for $1 \leq x \leq 3$
84.	12	Let number of regular working hours = x hours and number of overtime working hours = y hours. x + y = 172 15% of 57x = 114 y 57 15 % of (172 –y) = 114 y $\Rightarrow$ y = 12
85.	2	 Considers Δ APB having right angle at B AP = 4 + r BP = 4 – r AB = 4 Applying Pythagoras theorem

		$(4+r)^2 = (4-r)^2 + 4^2$ $\Rightarrow (4+r)^2 - (4-r)^2 = 16$ $\Rightarrow (4+r+4-r)(4+r-4+r) = 16$ $\Rightarrow r = 1$ cm
86.	13	$5^x - 3^y = 13438$ $\Rightarrow 5^{x-1} \times 5^1 - 3^y = 13438$ _____1 $\Rightarrow 5^{x-1} + 3^{y+1} = 9686$ $\Rightarrow 5^{x-1} + 3^y \times 3^1 = 9686$ _____2 Let $5^{x-1} = a$ & $3^y = b$ Then $5a - b = 13438$ and $a + 3b = 9686$ $\Rightarrow a = 3125, b = 2187$ $\Rightarrow 5^{x-1} = 3125 \Rightarrow x = 6$ $\Rightarrow 3^y = 2187 \Rightarrow y = 7$
87.	2	radius = 3 cm Let height = h cm HCF of 405,783,351=27 So each cylinder has used 27 cc of material which is equal to the volume of each cylinder. 27 cc = $\pi r^2 h$ $\Rightarrow h = \frac{3}{\pi}$ cm The number of cylinders made = $\frac{405+783+351}{27} = 57$ So total surface area of all the cylinders = 57($2\pi rh + 2\pi r^2$) cm^2 = 1026 (π +1) cm^2

88.	80	Let the score of D = 100 Then Score of C = 80 ⇒ Score of B = 100 ⇒ Score of A = 90 So if A scores 90 then D scores 100 ⇒ if A scores 72 then D scores 80
89.	44	$2^4 \times 3^5 \times 10^4$ $= 2^8 \times 3^5 \times 5^4$ Which has (8+1) (5+1) (4+1) factors i.e. 270 factors out of which perfect squares greater than 1 will be made by combinations of ($2^0,2^2,2^4,2^6,2^8$) × ($3^0,3^2,3^4$) ×($5^0,5^2,5^4$) excluding the combination $2^0 \times 3^0 \times 5^0$ So, possible combinations are = (5 × 3 × 3) – 1 = 44
90.	48	Let the length of track A = x m and that of track B = y m x +y = 325 And $\frac{9x}{6} = \frac{5y}{7.5} \Rightarrow$ x : y = 4:9 So x = $\frac{4}{13} \times 325 = 100$ Mary will complete one round of A which is of length 100m with a speed of 7.5 kmph Or 7.5 $\times \frac{5}{18}$ m/s in $\frac{100}{7.5 \times \frac{5}{18}}$ sec. = 48 sec.

91.	1	Hit and trial approach: Take a = 5 then b = 0, x = 13 and y = 0. So, k = ay-bx = 0 The only option that works here is 1st option. Technical approach: ax + by = 65 and –bx + ay = k , solving these two equations for x and y, we get, x = (65a – kb) / 25 and y = (65b + ak) / 25 By substituting these values in $x^2 + y^2 = 169$, we get k = 0.
92.	2	15,19,23,27,--------415 A.P. with common difference = 4 14,19,24,29,---------- 464 A.P. with common difference = 5 LCM of 4 & 5 = 20 which has to be the common difference in the sequence of common terms. So, Common terms are : 19 , 39, 59 ----- 415 19 + 20(n-1) ≤ 415 20(n-1) ≤ 396 n ≤ 20.8 So, n = 20
93.	1	Let the number of Fiction books = x and the number of Non-fiction books = y Given that, x+y = 11500 1.1x+1.12y = 12760 Solving the above two equations by multiplying the first one by 1.1 and then

		subtracting from the second equation: we get .02 y = 110 So y = 5500 and x = 6000 So, 1.1 x = 6000 × 1.1= 6600
94.	7	Let the six digit number be 100000a + 10000b+1000c+100d+10e+f Where a,b,c,d,e and f are digits. Given that, f= a+b+c ⇒f = a+2a+a=4a e = a+b ⇒ e = a+2a=3a c = a ⇒d = 7a b = 2a d= e+f ⇒ largest value possible for d is 7
95.	2	Let the salaries of Ramesh , Ganesh and Rajesh were 6x,5x,7x respectively in 2010. Let the salaries of Ramesh , Ganesh and Rajesh were 3y,4y,3y respectively in 2015. Salary of Ramesh in 2010 = 6x Salary of Ramesh in 2015 = 3y = 6x × 1.25 = 7.5x So y = 2.5 x Salary of Rajesh in 2010 = 7x and that in 2015 = 3y = 7.5 x Percentage increase in salary of Rajesh = $\frac{7.5x-7x}{7x}$ × 100≈ 7%
96.	4851	The given series has 24 terms and hence can be written as:

		48 n + [1+3+5+--------47] = 5280 48 n + 576 = 5280 So, n = 98 1+2+3+-------+98 $= \frac{98 \times 99}{2}$ = 4851
97.	150	Using the formula : each interior angle for a regular polygon having n sides = $\frac{(n-2)}{n} 180^0$ Given that, 3/2 times of $\frac{(a-2)}{a} 180^0$ = $\frac{(2a-2)}{2a}$ 180^0 (because b = 2a) ⇒ 3a-6=2a-2 ⇒a = 4 and b = 8 ⇒a + b = 12 Then each interior angle (in degrees)for a regular polygon having 12 sides = $\frac{(12-2)180}{12} = 150$
98.	3	Let the job was done in x days then given that, 90 % of the job was done by Anil and Sunil, so the work done by them is 0.9 $\frac{x}{20} + \frac{x-3}{40} = \frac{9}{10}$ x = 13 So the answer is 13 days
99.	20920	Let the amount invested by Bimal is x Rs The interest earned by Amal = 8% of 12,000 + 10,000 (1 + 6/200)^2 – 10,000 = 960+609 = 1569

		The interest earned by Bimal = x × $\frac{7.5}{100} \times 1$ Since both got the same amount of interest So, 1569 = x × $\frac{7.5}{100}$ So, x = 20920
100.	2	The amount paid by Bimal = x = p × 1.2 × 1.3 = 1.56 p The amount paid by Barun = y = p × 0.8 × 0.7 = .56p $\frac{x-y}{p} = \frac{p}{p} = 1$ (2nd option)