2016 Bull CAT 06

Directions of Test

Test Name	2016 Bull CAT 06	Total Questions	100	Total Time	180 Mins

Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking
Verbal Ability	34	1:0(h:m)	3	1/3
DI & Reasoning	32	1:0(h:m)	3	1/3
Quantitative Ability	34	1:0(h:m)	3	1/3

Section : Verbal Ability

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 1

In 2005, the University of Chicago Library held an exhibition entitled *Book Use, Book Theory: 1500-1700*. Its curators, Bradin Cormack and Carla Mazzio, displayed various books from the library s collection that sought to reveal the agency and character of early modern readers by way of the marginalia, marks, lists, and doodles left behind within the blank spaces of the texts themselves. They used the motto of Geoffrey Whitney s Choice of Emblemes (1586), the very first English emblem book, as a sort of speculative opening: Ususlibri, non lectioprudentesfacit. Roughly: Using a book, not reading it, makes us wise.

This, it seems to me, is a quietly remarkable phrase, one whose dichotomy may strike the modern reader as curious. After all, is not reading a book using it, in the most fundamental sense? A couplet from the emblem s accompanying poem may clarify Whitney s meaning:
First reade, then marke, then practise that is good,
For without vse, we drink but LETHE flood.

Mere reading, he says, is not enough; rather, we must mark our texts lest we forget the wisdom so recently acquired. Inscription is a critical part of use. Far from being passive, readers, in their act of marking a conscious deciding to remember become participants in a historical body of understanding. Cormack and Mazzio argue that this places readers at the center of a cultural process of book use that secures the continuity of knowledge.

This is the provenance of Stephen Orgel s*The Reader in the Book: A Study of Spaces and Traces*.Orgel, a professor in the Humanities Department at Stanford, has written what he calls a book about individual acts of reading ; while this is strictly accurate, it also undersells this brisk, varied, and often fascinating study, one that engages with, among other things, the materiality of reading early modern psychology and 16th-century book graffiti (more on graffiti later). The thrust of the work is that the history of any particular book does not conclude with its publication. Over five in-depth studies, including an investigation of a school boy s 500-year-old Latin grammar book and a deep dive into a bold countess s library and letters, he conducts a kind of archaeology of margins, gleaning sociological insight and human depth from the calcified life at the edge of the text, cases in which reading constitutes an active and sometimes adversarial engagement with the book. This interrogation of textual space, presented in blessedly jargon-free prose, constitutes a significant contribution to the study and interpretation of contemporary responses to now-classic texts, while also placing us squarely in the midst of that most mysterious element: the opaque substance of the reading mind.

The manifestation of this fragmentary, spectral presence is likely to surprise readers whose familiarity with marginalia begins and ends with checkmarks and interpretive gloss; indeed, a great deal of 16th- and 17th-century marginalia has nothing whatsoever to do with the text it is written in.

Orgel believes these marks constitute a kind of graffiti, albeit one stripped of its transgressive connotations. He argues this graffiti

reveals a material dimension (and a material value) of old books that has been lost to time: that is, the bound object as not merely text but also a place and a property , a locus of particular ownership benefitting from incremental enhancement.

According to the information given in the passage, the phrase 'adversarial engagement with the book' will stand for which of the following interpretations?

A) engaging a book presents a challenge in itself B) engaging with a book does not mean that you learn from the book
✓C) engaging with a book can lead to disagreement with the given content D) reading a book is not a passive exercise

Explanation:- *In this case, you need to know the meaning of the word 'adversarial'. It means 'involving or characterized by conflict or opposition.' Considering this, we can see that option 3 is the best fit for the given case.*

Question No. : 2

According to the author of the passage:

A) the mind of a reader can be clearly understood by the graffiti he scribbles on book margins
B) the mind of a reader cannot be understood from the inscriptions in the margins
✓C) the mind of a reader is not something is which is necessarily open to precise understanding D) both (a) and (c)

Explanation:- *The answer to this question can be found from the lines: This interrogation of textual space, presented in blessedly jargon-free prose, constitutes a significant contribution to the study and interpretation of contemporary responses to now-classic texts, while also placing us squarely in the midst of that most mysterious element: the opaque substance of the reading mind.*
The last line is particularly significant in the given case.

Question No. : 3

According to Orgel:

I. books served the purpose of supplying information to the text.
II. books carried an intrinsic material values in themselves, which is often forgotten.
III. publication is not the be-all and end-all of books.

A) I & II B) II & III C) I & III ✓D) All of these

Explanation:- *Statements I and II can be derived from the lines: He argues this graffiti reveals a material dimension (and a material value) of old books that has been lost to time: that is, the bound object as not merely text but also a place and a property , a locus of particular ownership benefitting from incremental enhancement.*
Statement III can be derived from the lines: The thrust of the work is that the history of any particular book does not conclude with its publication.

Question No. : 4

According to Geoffrey Whitney:

A) The act of marking in a book mentally liberates a reader ✓B) The act of marking in a book acts like a post-it for the reader
C) The act of marking in a book is a superficial act of posterity D) Both (A) and (B)

Explanation:- *Refer to the lines: Far from being passive, readers, in their act of marking a conscious deciding to remember become participants in a historical body of understanding.*
A post-it is a nothing else but a sticky note for remembering things. We can see that option 2 is the perfect fit in the given case.

Question No. : 5

For the given usage in the second paragraph, the word 'dichotomy' means:

✓A) contrast B) divorce C) gulf D) split

Explanation:- *The meaning for the word: a division or contrast between two things that are or are represented as being opposed*

or entirely different.
Synonyms for dichotomy: division, separation, divorce, split, gulf, chasm

Refer to the lines now: This, it seems to me, is a quietly remarkable phrase, one whose dichotomy may strike the modern reader as curious. After all, is not reading a book using it, in the most fundamental sense?
In the given case, we can see that the word 'contrast' best fits as a replacement for the word. This makes option 1 the correct answer.
This is a close question as the other words are also synonyms for the word. But remember, we need to select a word which best fits in the given context.

Question No. : 6

The primary purpose of the author of the passage is:

A) To highlight an inconsistency that has dogged a certain interpretation for long
✓B) To highlight an alternate way of interpreting a certain action that has been viewed from a traditional lens so far
C) To provide additional evidence for a certain academic viewpoint that has existed for long
D) To highlight the use the of an additional argument that helps clear a certain ambiguity

Explanation:- *In the given case, option 2 is the best answer option. It highlights how the activities of the reader can be interpreted in a different manner and how his inscriptions can be seen in another light.*

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 7

One of the most curious sub-plots on Referendum day was what quickly, and predictably, became known on social media as pen-gate . Groups of Brexit campaigners started to hand out pens in polling stations to replace the government-issued pencils with which voters are usually asked to make their cross. Their worry was that, somewhere along the electoral line, a pencil cross in the Leave box could easily be erased by those working on behalf of the establishment , and replaced with a vote for Remain . Police were apparently called to one polling station to investigate the potentially disruptive distribution of alternative voting instruments.

There is a tiny glimpse here of the edgy anxieties of Western democracy. It seems inconceivable to most of us that our leaders should stoop to the tactics of the world s worst pseudo-democratic dictators who would go to almost any lengths, the less ingenious the better, to claim a popular mandate (and, for what it is worth, in my view it is inconceivable). Yet, at the same time, it is hard entirely to banish the suspicion that our own complacency could actually be blinding us to what those in power might be doing to get their way. There is also a very long pedigree to these anxieties about how far you can trust what the voters are supposed to have written on their ballot papers. Electoral fraud of that kind is as old as democracy itself, and was an issue even in the famous ancient Athenian institution of ostracism usually taken to be a canny system of keeping the elite in check, and a far more radical deployment of popular power than any modern referendum.

Modern historians have found in ostracism one of the most appealing inventions of fifth-century BC politics. It involved the Athenian citizens getting together and deciding which politician they wanted to get rid of from their city, into honourable exile, for ten years. Each man wrote the name of his chosen victim on a little piece of broken pottery (an ostrakon, hence ostracism), chucked it into a voting urn and, with a few safeguards such as a quorum of 6,000, whoever got the most votes was sent away. It is not surprising that ostracism has become such a modern favourite. Just imagine , so the argument goes, being able to get rid of some loud mouth politician you didn t like, simply by voting him out . . . . Boris Johnson has been a particularly enthusiastic supporter, seemingly unaware of his own vulnerability: That was people power , he once said; it only needed enough citizens to show up and vote, and kerpow, you were spending the next ten years twiddling your thumbs in Bulgaria . . . . Imagine the exhilaration of catapulting someone off like that .

The system was not, in fact, quite so straightforward nor was it quite so clear who was behind the catapulting. One of the most curious archaeological finds of the last century was a cache of 190 ostraka, with the name of Themistokles (who was ostracized in 472 BC) scratched on each one, in just fourteen different hands. It does not take much imagination to see what must have been going on: an ancient plot not so very far from what the pen-gate Brexiters suspected. Some of Themistokles powerful enemies presumably prepared a huge pile of ready-inscribed ostraka (the 190 are only the left-overs) and handed them out to the mostly illiterate voters, maybe even disguising whose name was actually on the ostraka. You can get away with a lot if the electorate can t read: it was more popular manipulation than popular power.

A different version of manipulation put an end to the whole system. Despite its modern fame, ostracism only lasted about seventy years and fewer than fifteen people were ever sent into exile this way. The last was an unlucky character, who is supposed to have been the victim of a stitch-up in 416 BC when two rival establishment figures, Nikias and Alkibiades, both major candidates for exile, decided to do a deal and get their own supporters to turn their votes against a third party, by the name of Hyperbolos. It was he who was sent away, while the intended targets escaped scot-free. No one could have failed to spot what had gone on. And the glaring exposure of establishment control and of their self-interested trade-off destroyed any myth of people power. Ostracism was never used again.

The example of Hyperbolos showcases:

✓A) failing of a certain system B) power of a certain methodology C) prejudice of a certain method
D) sanity in a certain measure

Explanation:- *The example of Hyperbolos simply showcases the weakness/flaw of the system of ostracism. Keeping this in mind, we can find that option 1 is the correct answer here.*

Question No. : 8

In the given context of the passage, ostracism refers to:

I. exile II. expulsion
III. cold-shouldering IV. blackballing

A) I, II & III B) II, III & IV ✓C) I, II & IV D) All of the above

Explanation:- *Let us explore the individual word meanings to identify the correct answer:*
Exile: Expel from a country
Expulsion: The act of forcing out someone or something
Cold-shouldering: Pay no attention to, disrespect
Blackballing: Expel from a community or group
We can see that I, II and IV perfectly fit the given context.

Question No. : 9

The author of the passage seems to raise which one of the following questions in the passage?

A) Manipulation to the masses? B) Democracy to the doers? C) Franchise for disenfranchised? ✓D) Power to the people?

Explanation:- *The author of the passage is essentially questioning whether the systems developed in democracy truly provide power to the electorate or not. Refer to the lines: Electoral fraud of that kind is as old as democracy itself, and was an issue even in the famous ancient Athenian institution of ostracism usually taken to be a canny system of keeping the elite in check, and a far more radical deployment of popular power than any modern referendum....Boris Johnson has been a particularly enthusiastic supporter, seemingly unaware of his own vulnerability: That was people power , he once said; it only needed enough citizens to show up and vote, and kerpow, you were spending the next ten years twiddling your thumbs in Bulgaria . . . . Imagine the exhilaration of catapulting someone off like that .....You can get away with a lot if the electorate can t read: it was more popular manipulation than popular power ..Did it really deliver direct people power, and to what effect?*
Connecting the dots, we can see that option 4 is the best answer in the given case.

Question No. : 10

It can be inferred from the passage that:

A) Boris Johnson is a particularly popular politician ✓B) Boris Johnson is not a politician who is appreciated by all
C) Boris Johnson does not truly understand the Athenian institution of ostracism D) None of the above

Explanation:- *The answer to the this question can be derived from the lines: Boris Johnson has been a particularly enthusiastic supporter, seemingly unaware of his own vulnerability: That was people power , he once said; it only needed enough citizens to show up and vote, and kerpow, you were spending the next ten years twiddling your thumbs in Bulgaria . . . . Imagine the*

exhilaration of catapulting someone off like that .

Question No. : 11

Identify the apt option as per the information given in the passage.

A) There are nations where rulers make a sham out of democratic processes.
B) Electoral fraud is not uncommon in democracies. ✓C) Both (A) and (B) D) Neither (A) nor (B)

Explanation:- *Option 1 can be derived from the lines: There is a tiny glimpse here of the edgy anxieties of Western democracy. It seems inconceivable to most of us that our leaders should stoop to the tactics of the world s worst pseudo-democratic dictators who would go to almost any lengths, the less ingenious the better, to claim a popular mandate (and, for what it is worth, in my view it is inconceivable).*
Option 2 can be derived from the lines: Electoral fraud of that kind is as old as democracy itself, and was an issue even in the famous ancient Athenian institution of ostracism usually taken to be a canny system of keeping the elite in check, and a far more radical deployment of popular power than any modern referendum.

Question No. : 12

It can be inferred from the passage that "the establishment" was:

A) pro-leave ✓B) pro-remain C) impartial and honest D) unfair and manipulative

Explanation:- *The answer can be derived from the lines: Their worry was that, somewhere along the electoral line, a pencil cross in the Leave box could easily be erased by those working on behalf of the establishment , and replaced with a vote for Remain .*

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 13

How should we treat science s growing pains?

There is no lack of initiatives to tackle science s crisis in all its aspects, from reproducibility to the abuse of metrics, to the problems of peer review. This gives good grounds for hope that the crisis will eventually be resolved, and that it will not become a general crisis of trust in science. Should that occur, and science ceases to be a key cultural symbol of both truth and probity, along with material beneficence, then the consequences could be far-reaching. To that end, we should consider what lies behind the malpractices whose exposure has triggered the crisis over the last decade.

It is clear that a combination of circumstances can go far to explain what has gone wrong. Systems of controls and rewards that had evolved under earlier conditions have in many ways become counterproductive, producing perverse incentives that become increasingly difficult for scientists to withstand. Our present problems can be explained partly by the transformation from the little science of the past to the big science or industrialised science of the present. But this explanation raises a problem: if the corrupting pressures are the result of the structural conditions of contemporary science, can they be nullified in the absence of a significant change in those conditions?

We should explore how these new conditions lead to these new pressures. There are two familiar qualitative aspects of the steady quantitative growth of the scientific enterprise. The first is the loss of Gemeinschaft , where all communities and sub-communities have become so large that personal acquaintance no longer dominates in the professional relationships. The old informal systems of rewards and sanctions are no longer effective. Under the new Gesellschaft conditions, such intimate tasks of governance must be made objective . Ironically, applying a scientific methodology to the tasks of governance of science leads directly to corruption, since any such system can be gamed. Allied to that development is a second one, the hugely increased capital-intensity of science, so that the typical context of discovery is no longer the scientist with his test-tube, but a large lab with division of labour on an industrial scale. In the absence of the discipline of customers for a product (however corrupted that might be), there is nothing to ensure quality control except those informal systems that are already obsolete.

Just as this new system was becoming dominant, by a cruel accident of fate a third element has intruded: stasis. The social subsystem of science whereby it reproduces itself, namely the training and certification of postgraduates, depends on the possibility of recruitment of at least a significant minority. This will necessarily be small, as even the traditional steady growth rate

of science allows only a few new recruits in the course of a scientist s career.

But when even that prospect vanishes, recruitment stalls, and the existing corps of researchers is squeezed, many pathologies inevitably ensue. The obvious one is the proletarianisation of research work. Recruits (and teachers) face the prospect of a lifetime sequence of short-term jobs on contracts, lacking any rights of security and whose renewal depends on the favour of the principal investigator. Maintaining the lofty ideals of independence and integrity becomes increasingly difficult.

Under these harsh conditions, quality becomes instrumentalised. To strive for excellence may be impractical; impact is the name of the game. The self-sacrificing quest for scientific rigour is displaced by the need to jockey among journals, and perhaps also engage in p-hacking to obtain interesting results. But there is a deeper cause at work. Perhaps those who engage in what we might call shoddy science or even sleazy science don t even know that it is sub-standard. The problem may have been building up for decades in the past, when standards gradually slipped and the basic skills of rigorous scientific work were allowed to atrophy. As evidence we have the current state of statistical practice, of which the best is as sophisticated and self-critical as possible, but where there is also much that is an insult.

In the given context, the word 'jockey' means:

A) Someone employed to ride horses in horse races B) Struggle by every available means to achieve something
C) An operator of some vehicle, machine or apparatus
✓D) Handle or manipulate (someone or something) in a skilful manner

Explanation:- *Refer to the lines: Under these harsh conditions, quality becomes instrumentalised. To strive for excellence may be impractical; impact is the name of the game. The self-sacrificing quest for scientific rigour is displaced by the need to jockey among journals, and perhaps also engage in p-hacking to obtain interesting results.*
We can clearly see that the given context is negative in nature. Considering this, we can identify option 4 as the correct answer.

Question No. : 14

When the author says 'Should that occur' in the first paragraph, he is referring to:

A) how the crises in science will be eventually resolved ✓B) how a general crises of trust in science can come to fruition
C) how a general crises of trust in science will be averted D) none of the above

Explanation:- *Refer to the lines: This gives good grounds for hope that the crisis will eventually be resolved, and that it will not become a general crisis of trust in science. Should that occur, and science ceases to be a key cultural symbol of both truth and probity, along with material beneficence, then the consequences could be far-reaching.*
It is from the lines following the one in question that the answer can be derived definitively. It is clear that the author is referring to a negative outcome in science and how this will have a bad impact. Considering this, we identify option 2 as the correct answer.

Question No. : 15

According to the author of the passage:

I. The current system of controls and rewards have been manipulated by scientists.
II. Non-personal and bias-free methods of control have actually lead to counter-productive outcomes.
III. Science, being driven by capital intensive and industrial scale operations, does not have the checks and balances required for scientific probity.

A) I & II B) II & III C) I & III ✓D) All of the above

Explanation:- *Statement I is derived from the lines: Systems of controls and rewards that had evolved under earlier conditions have in many ways become counterproductive, producing perverse incentives that become increasingly difficult for scientists to withstand.*
Statement II can be derived from the lines: The old informal systems of rewards and sanctions are no longer effective. Under the new Gesellschaft conditions, such intimate tasks of governance must be made objective . Ironically, applying a scientific methodology to the tasks of governance of science leads directly to corruption, since any such system can be gamed.
Statement III can be derived from the lines: Allied to that development is a second one, the hugely increased capital-intensity of science, so that the typical context of discovery is no longer the scientist with his test-tube, but a large lab with division of labour on an industrial scale. In the absence of the discipline of customers for a product (however corrupted that might be), there is

nothing to ensure quality control except those informal systems that are already obsolete.

Question No. : 16

What does the author mean by the phrase 'proletarianisation of research work'?

A) researchers lose control over the freedom of their work choices and are bound by the choices of their employers.
B) researchers are bound to job roles and conditions they may not necessarily opt for voluntarily. ✓C) both (a) and (b)
D) neither (a) nor (b)

Explanation:-
In Marxism, proletarianisation is the social process whereby people move from being either an employer or self-employed (or rarely unemployed), to being employed as wage labor by an employer. In Marxian theory, proletarianisation is often seen as the most important form of downward social mobility.
Refer to the lines now: The obvious one is the proletarianisation of research work. Recruits (and teachers) face the prospect of a lifetime sequence of short-term jobs on contracts, lacking any rights of security and whose renewal depends on the favour of the principal investigator. Maintaining the lofty ideals of independence and integrity becomes increasingly difficult.
Combining the two, we can see that both options (1) and (2) are correct in the given case.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 17

In 2005, the University of Chicago Library held an exhibition entitled *Book Use, Book Theory: 1500-1700*. Its curators, Bradin Cormack and Carla Mazzio, displayed various books from the library s collection that sought to reveal the agency and character of early modern readers by way of the marginalia, marks, lists, and doodles left behind within the blank spaces of the texts themselves. They used the motto of Geoffrey Whitney s Choice of Emblemes (1586), the very first English emblem book, as a sort of speculative opening: Ususlibri, non lectioprudentesfacit. Roughly: Using a book, not reading it, makes us wise.

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text but also a place and a property , a locus of particular ownership benefitting from incremental enhancement.

The author of the passage can be said to be:

✓A) demanding sincere action B) fair introspection C) highlight obvious doubts D) figuring out a complex conundrum

Explanation:- *In the given case, the author of the passage is highlighting the issues with science and how these have become issues that need to be redressed. Considering that he wishes these issues to be resolved, we can see that option 1 is the best choice in the given case.*

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 18

How should we treat science s growing pains?

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Just as this new system was becoming dominant, by a cruel accident of fate a third element has intruded: stasis. The social subsystem of science whereby it reproduces itself, namely the training and certification of postgraduates, depends on the possibility of recruitment of at least a significant minority. This will necessarily be small, as even the traditional steady growth rate of science allows only a few new recruits in the course of a scientist s career.

But when even that prospect vanishes, recruitment stalls, and the existing corps of researchers is squeezed, many pathologies inevitably ensue. The obvious one is the proletarianisation of research work. Recruits (and teachers) face the prospect of a lifetime sequence of short-term jobs on contracts, lacking any rights of security and whose renewal depends on the favour of the principal investigator. Maintaining the lofty ideals of independence and integrity becomes increasingly difficult.

Under these harsh conditions, quality becomes instrumentalised. To strive for excellence may be impractical; impact is the name of the game. The self-sacrificing quest for scientific rigour is displaced by the need to jockey among journals, and perhaps also engage in p-hacking to obtain interesting results. But there is a deeper cause at work. Perhaps those who engage in what we might call shoddy science or even sleazy science don t even know that it is sub-standard. The problem may have been building up for decades in the past, when standards gradually slipped and the basic skills of rigorous scientific work were allowed to atrophy. As evidence we have the current state of statistical practice, of which the best is as sophisticated and self-critical as possible, but where there is also much that is an insult.

In the given context, the phrase 'p-hacking' means:

A) Discovery of statistics such that the desired outcome assumes "statistical significance", usually for the benefit of the study's sponsors.
B) Creation of statistics such that the desired outcome assumes "statistical significance", usually for the benefit of the study's researchers.
C) Corroboration of statistics such that the desired outcome assumes "statistical significance", usually for the benefit of the study's researchers.
✓D) Manipulation of statistics such that the desired outcome assumes "statistical significance", usually for the benefit of the study's sponsors.

Explanation:- *Refer to the lines: Under these harsh conditions, quality becomes instrumentalised. To strive for excellence may be impractical; impact is the name of the game. The self-sacrificing quest for scientific rigour is displaced by the need to jockey among journals, and perhaps also engage in p-hacking to obtain interesting results.*
We can clearly infer the implied meaning in this case. The author wishes to imply how results are being manipulated for personal gain. Keeping this in mind, we can see that option 4 is the correct answer.

DIRECTIONS for the question : *Read the passage and answer the question based on it.*

Question No. : 19

The radio and telephone technologies on which cellular systems are based each claim a distinct commercial and engi neering tradition, and the segment of the radio industry from which cellular derives is even more distinct. The radios were produced by large, sophisticated companies that specialized in radio tech nology. The customers were a multitude of small, dispersed organizations for whom the radio was an accessory to their mission rather than a central component. Radio engineers had a reputation in the industry as cowboys: their knowledge was empirical, ad hoc, hands-on. They jiggled the system in the field until it worked. Signal quality was often in different, fading inand out and none of this seemed to bother the end users. Telephone equipment producers were also large and tech nically sophisticated, but the customers for their equipment were large and sophisticated companies too. In the tele phone equipment industry, quality was an obsession.

The companies that pioneered cellular typically came from either the radio or the telephone side of the business. AT & T was a telephone company. Motorola and Matsushita were radio companies. Each faced the major challenge of finding a partner who understood the other side of the technology and then learning to work inti mately with that partner to create the new product. Not an easy task. The cultural differences between radio and tele phone engineering were deep-rooted.

Blue Jeans
The centerpiece of the blue jeans case study was Levi Strauss and Co., which started out as a manufacturer of workmen's blue jeans. "Levi's" remains the company's defining product. In the United States, blue jeans are the standard work clothing. They are produced in very large volume and have been sold in a limited number of standard cuts and styles since they were first introduced by Levi Strauss in San Francisco in 1873. Levi's are the pro totypical commodity of American mass consumption, the Model T of the garment industry. Clothing production is no toriously difficult to mechanize, but the cutting and assembly of jeans is as close to assembly-line production as can be found in the outer garment industry.

Historically, blue jeans have had very little fashion content. This changed dramatically inthe early 1970s, propelled by the sudden popularity of American-made jeans in Europe. Levi Strauss moved to take advantage of this trend by selling its Levi's products abroad for two and three times the retail price they commanded in the United States. The spread be tween European prices and costs created enormous profits that attracted local producers into the industry. To compete with the cachet of American-made jeans, these new entrants sought to stylize their garments, differentiating the product through new cuts, finishes, and variations uponthe standard dark-blue denim. These fashions were then imported into the United States in the early 1980s, invading Levi's home mar ket. Levi Strauss was forced to defend its brand by adopting many of the European fashions and, ultimately, to preempt the Europeans by introducing innovations of its own.

The focus in blue jeans fashion, almost from the beginning and certainly inrecent years, has been the finishing process and the way this affects the look and "hand," or feel, of the garment. The basic technology involves laundering the garment to soften the texture of the fabric. The finished garment is typically abraded as well. The standard abrading technique is to wash the jeans with "stones" or pumice. There is continual experimentation with new techniques, both to produce effects already achieved in other ways and to create new effects. In the pursuit of a fashion edge, manufacturers expend as much as 80 percent of the life of the garment during the finishing process.

These new finishing techniques have led to a cascade of changes in cooperating industries. Textiles have been rede signed to better withstand the extensive abrasion. Washing machines have been redesigned to survive the abuse of stone washing. Con tinuing changes in raw materials and equipment have the in cidental effect of subtle and not so subtle changes in the look and feel of the finished garment; this in turn becomes a new fashion element.

Thus, the conversion of Levi Strauss from a manufactur ing company to a fashion house involved crossing the boundaries that separated manufacturing from style and design and from the previously distinct industries of textiles, laundering and finishing, and washing machines. In many ways the cultures of these industries *were* as different as the cultures of telephone and radio. Levi's old garment-assembly operations and the design and manufacture of washing machines were highly structured and engineered, although based of course on quite different technologies. Both style and finishing tended to be much more free-wheeling, ad hoc, intuitive, or empirical, although the kind of intuition in volved in producing new finishing effects was very different from the intuition involved in fashion.

What is the main idea conveyed in the passage?

A) The passage suggests that historical transformation of the jeans from a commodity of mass consumption to a product of fashion statement.
B) Cultural differences between radio and telephone equipment industries posed challenges to establishing an effective partnership between them.
✓C)Companies with different cultural environments technologies and practices can create meaningful synergies by understanding each other s requirements and competencies.
D) Cellular companies and blue jeans companies are not able to change and develop with time due to lack of cooperation among their respective cooperating industries.

Explanation:-
Option A is not the major idea. The main idea is the way in which different companies having different cultural environments adapted to each other's requirements to make jeans a fashionable clothing and introducing newer designs. This same idea is further extended to possible cooperation between radio and telephone companies on similar lines in order to develop cellular technology. Hence option C captures this idea. Option B is merely a statement that is true in context of passage but not the main idea. Option D is clearly opposite to the idea expressed in passage.

Question No. : 20

Which of the following is not false as per context of the passage?

A) Use of jeans as a fashion product by introduction newer styles originated in America during later half of the 20^{th} century.
✓B)Requirements of introducing desired changes in blue jeans look or feel subsequently resulted in changes in various cooperating industries.
C) Finishing enhanced durability of a garment as compared to a non- finished product.
D) Levi Strauss & co. initially manufactured jeans for influential classes only which later on became a commodity of mass consumption.

Explanation:-
Option A is incorrect as jeans as a fashion product originated in Europe, option C is incorrect as finishing reduces the durability by almost 80%, option D is incorrect as Levi Strauss manufactures jeans for the masses from beginning itself. Option B is true as per the lines ''These fashions were then imported into the United States in the early 1980s, invading Levi's home mar ket. Levi Strauss was forced to defend its brand by adopting many of the European fashions and, ultimately, to preempt the Europeans by introducing innovations of its own'' and as per the lines ''These new finishing techniques have led to a cascade of changes in cooperating industries. Textiles have been rede signed to better withstand the extensive abrasion. Washing machines have been redesigned to survive the abuse of stone washing. Con tinuing changes in raw materials and equipment have the in cidental effect of subtle and not so subtle changes in the look and feel of the finished garment; this in turn becomes a new fashion element''.

Question No. : 21

Which of the following statement is in consonance with the idea of model T mentioned in the passage?

✓A) Jeans were quite affordable due to large scale production and hence became very popular among the masses.
B) The production of the jeans was difficult to mechanize and hence it resulted in costlier products for the masses.
C) Jeans were produced incorporating a large number of cuts and styles which made it popular.

D) Jeans were popular among the elite classes rather than the masses.

Explanation:-

Model T implies a product which is consumed by the masses. Option B is incorrect because unlike normal clothing production jeans could be produced using assembly line production (mechanization is possible) and option C is incorrect because jeans were popular in america inspite of the limited no. of cuts and styles. Option D is incorrect as it was meant for mass consumption. Model T highlights jeans being a commodity of mass consumption due to large scale production (as a result of assembly line) and lower prices (hence affordable). Option A is true as per the lines ''Levi's are the pro totypical commodity of American mass consumption, the Model T of the garment industry. Clothing production is no toriously difficult to mechanize, but the cutting and assembly of jeans is as close to assembly-line production as can be found in the outer garment industry''.

DIRECTIONS for the question: *Read the passage and answer the question based on it.*

Question No. : 22

The tale of reading begins when the retina receives photons reflected off the written page. But the retina is not a homogeneous sensor. Only its central part, called the fovea, is dense in high-resolution cells sensitive to incoming light, while the rest of the retina has a coarser resolution. The fovea, which occupies about 15 degrees of the visual field, is the only part of the retina that is genuinely useful for reading. When foveal information is lacking, whether due to a retinal lesion, to a stroke having destroyed the central part of the visual cortex, or to an experimental trick that selectively blocks visual inputs to the fovea, reading becomes impossible."

The need to bring words into the fovea explains why our eyes are in con stant motion when we read. By orienting our gaze, we "scan" text with the most sensitive part of our vision, the only one that has the resolution needed to determine letters. However, our *eyes* do not travel continuously across the page.' Quite the opposite: they move in small steps called saccades. At this very moment, you are making four or five of these jerky movements every second, in order to bring new information to your fovea. Even within the fovea, visual information is not represented with the same precision at all points. In the retina as well as in the subsequent visual relays of the thalamus and of the cortex, the number of cells allocated to a given por tion of the visual scene decreases progressively as one moves away from the center of gaze. This causes a gradual loss of visual precision. Visual accuracy is optimal at the center and smoothly decreases toward the periphery. We have the illusion of seeing the whole scene in front of us with the same fixed accu racy, as if it were filmed by a digital camera with a homogeneous array of pixels. However, unlike the camera, our eye sensor accurately perceives only the precise point where our gaze happens to land. The surroundings are lost in an increasingly hazy blurriness

One might think that, under these conditions, it is the absolute size of printed characters that determines the ease with which we can read: small letters should be harder to read than larger ones. Oddly enough, however, this is not the case. The reason is that the larger the characters, the more room they use on the retina. When a whole word is printed in larger letters, it moves into the periphery of the retina, where even large letters are hard to discern. The two factors compensate for each other almost exactly, so that an enormous word and a minuscule one are essentially equivalent from the point of view of retinal precision. Of course, this is only true provided that the size of the characters remains larger than an absolute minimum, which corresponds to the maximal precision attained at the center of our fovea. When visual acuity is diminished, for instance in aging patients, it is quite logical to recommend books in large print .Our eyes impose a lot of constraints on the act of reading. The structure of our visual sensors forces us to scan the page by jerking our eyes around every two or three tenths of a second Reading is nothing but the word-by-word mental restitution of a text through a series of snapshots. 'file some small grammatical words like "the," "it or "is" can sometimes be skipped, almost all content words such as nouns and verbs have to be fixated at least once.

These constraints are an integral part of our visual apparatus and cannot be lifted by training. One can certainly teach people to optimize their eye movement s patterns, but most good readers, who read four hundred words per minute, are already close to optimal. Given the reti nal sensor at our disposal, it is probably not possible to do much better. A simple demonstration proves that eye movements are the rate-limiting step in reading. If a full sentence is presented, word by word, at the precise point where gaze is focalized, thus avoiding the need for eye movements, a good reader can read five hundred words per minute at staggering speed a mean of eight hundred words per minute, and up to sixteen hundred words per minute for the best readers, is about one word every forty milliseconds and three to four times faster than normal reading! With this method, called rapid sequential visual presentation, or RSVP, identification and comprehension remain satisfactory, thus suggesting that the duration of those central steps does not impose a strong constraint on normal reading. Perhaps this computerized presentation mode represents the future of reading in a world where screens progressively replace paper.

At any rate, as long as text is presented in pages and lines, acquisition through gaze will slow reading and impose an unavoidable limitation. Thus, fast reading methods that advertise gains in reading speed of up to one thou sand words per minute or more must be viewed with skepticism. One can no doubt broaden one's visual span somewhat, in order to reduce the number of saccades per line, and it is also possible to learn to avoid moments of regres sion, where gaze backtracks to the words it has just read. However, the physi cal limits of the eyes cannot be overcome, unless one is willing to skip words and thus run the risk of a misunderstanding. Woody Allen described this situ ation perfectly: "I took a speed-reading course and was able to read *War and Peace* in twenty minutes. It involves Russia."

Why does the author recommend books in larger print for old people?

A) A larger word occupies more space on retina and thus easily visualized.
B) A larger word and smaller word are equivalent from point of view of retinal precision.
✓C) The absolute minimum size of characters, to be able to be seen, is more in old people due to lower ocular sharpness.
D) In old people the fovea has higher resolution cells requiring larger letters.

Explanation:-
Refer to the lines 11-15 of the third para"When visual acuity large print". A word printed in larger letters moves into the periphery of the retina and thus it is hard to discern for the eye. Therefore option A is false. Option B is not true as smaller and larger letters are different for the retina. Option C seems to be the best answer. Option D is factually wrong.

Question No. : 23

What can be inferred regarding the evolvement of reading in the coming times?

A) Readers will be able to read more in less time by reducing the number of saccades per line and in the process, they will generally not experience any loss of comprehension.
B) Reading will be more effective in future because a reader can read at a staggering speed with the help of rapid sequential visual presentation method.
✓C) Reading speed may increase due to computerized presentation involving fixing of gaze and obviating the need for eye movement.
D) Readers will be able to read fast by overcoming the physical limitation of eyes.

Explanation:-
Refer to the last sentence of the second last para "Perhaps .replace paper." Option B represents a twisted form of the given information in the passage. Option A is only partially correct. It s first half is correct but in the second half, wherein it states that there is no loss of comprehension, the option commits a mistake and goes against the passage. Option D is irrelevant and was nowhere mentioned in the passage.

Question No. : 24

According to the passage, which of the following option(s) determines the rate of reading?

(i) Our perceptual abilities which exclusively depend on the number of letters in the words not space these words occupy on our retina.
(ii) The requirement of moving the gaze across the page.
(iii) Twitching of our eyes while reading the text.
(iv) The requirement of maintaining a fixed gaze on the page without any eye movement.

A) Both (ii) and (iv) B) Both (i) and (ii) ✓C) Both (ii) and (iii) D) Option (i), (ii) and (iii)

Explanation:-
Statement (i) is nowhere mentioned in the passage whereas statement (iv) is false as per the information given in the passage. Refer to the first 5-6 line of the 2nd para .Both the statements (ii) and (iii) are mentioned in 2nd paragraph.

DIRECTIONS for question: *Four sentences related to a topic are given below. Three 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.*

Question No. : 25

1. There is general relativity, which beautifully accounts for gravity and all of the things it dominates: orbiting planets, colliding galaxies, the dynamics of the expanding universe as a whole. That s big.
2. The conflict between the two halves of physics has been brewing for more than a century sparked by a pair of 1905 papers by Einstein, one outlining relativity and the other introducing the quantum but recently it has entered an intriguing, unpredictable new phase.
3. At present physicists have two separate rulebooks explaining how nature works.
4. Then there is quantum mechanics, which handles the other three forces electromagnetism and the two nuclear forces. Quantum theory is extremely adept at describing what happens when a uranium atom decays, or when individual particles of light hit a solar cell. That s small.
(in numerical value)

A) 2 B) C) D)

Explanation:-
In this case, the tricky part of the problem is that all the statements are related to the subject of the paragraph. Statements 3-1-4 form the connected set of statements as they highlight a logical structure of connected statements. Statement 3 introduces the subject, statements 1 and 4 then provides two rulebooks explaining how nature works. Statement 2 talks about the conflict between these two rulebooks; this is subject that not been introduced so far and does not relate to the other three sentences.

DIRECTIONS for question: *Four sentences related to a topic are given below. Three 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.*

Question No. : 26

1. This is probably the first time in history that young readers themselves are demanding protection from the disturbing content of their course texts, yet reading has been seen as a threat to mental health for thousands of years.
2. Some contend that Virginia Woolf s novel Mrs Dalloway (1925), in which a suicide has taken place, could trigger suicidal thoughts among those disposed to self-harm.
3. At universities around the world, students are claiming that reading books can unsettle them to the point of becoming depressed, traumatised or even suicidal.
4. Others insist that F Scott Fitzgerald s The Great Gatsby (1925), with its undercurrent of spousal violence, might trigger painful memories of domestic abuse.
(in numerical value)

A) 1 B) C) D)

Explanation:-
In this case, the set of statements, 3-2-4, provides us with the information with regards to the nature of the paragraph. Statement 3 is the opening sentence and statements 2 and 4 are examples for statement 3. Statement 1 does not fit in the given context as it diverges from the introductory nature of the other 3 statements.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 27

1. If it is to appeal to practical men and civic workers, it is important that the methods for the systematic study of cities be not only the product of the study, but also be those which may be acquired through local observation and practical effort.
2. This point of view has next to be correlated with the corresponding practical experience.
3. My problem is thus to outline such ideas as may crystallize from the experience of any moderately-travelled observer, so that his panoramic observations should gradually develop towards an orderly Regional Survey.
4. Practical experience may be acquired through varied experiences of citizenship, which rise towards a larger, more orderly conception of civic action as Regional Service.
5. This department of sociological studies should evidently be, as far as possible, concrete in treatment.
(in numerical value)

A) 51324 B) C) D)

Explanation:-
Notice how the lines 3 and 2 are linked logically with the words My problem .. and This point of view .The word next in line 2 clearly indicates that it should be preceded by line 3. The words practical experience in line 2 find an echo in line 4, which serves to further explain the given idea. Thus, line 2 should be followed by line 4. Line 5 is a fairly general comment, which deserves a place in the beginning.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 28

1. But a generation ago, this idea fell under suspicion as August Weismann, a zoology professor championed a new idea so effectively that it is now a part of every biologist s creed: The body does not produce the germ-cells; instead, the germ-cells produce the body.
2. Human beings result from the union of an egg-cell and a sperm-cell and these cells are part of a continuous stream of germ-plasm ever since life appeared on the globe, and will continue as long as it exists.
3. The idea held by him like is still held by those who have not given particular attention to the subject.
4. Generation is conceived as a direct chain: the body produces the germ-cell which produces another body, which in turn produces another germ-cell, and so on.
5. Early investigators looked on the germ-cells as a bodily product, which reproduce the character of the original body and Darwin elaborated how the various characters could be represented in the germ-cell.
(in numerical value)

A) 25341 B) C) D)

Explanation:-
The word him and still in line 3 clearly hint at darwin mentioned in line 5 and not Wiesmann. Thus line 5 should be followed by line 3. Please take note of conceived in line 4, which refers to an idea. This idea was countered later, as given in line 1, making 4-1 a strong, logical link. Line 2 is a perfect opening line as the ideas in it are further discussed by the rest of the lines here.

DIRECTIONS for question: *Four sentences related to a topic are given below. Three 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.*

Question No. : 29

1. Puri illustrates one of the most pertinent reasons why there can never be a revolution in India.
2. Patches of full employment ensure that joblessness is seen as a temporary phenomenon, not a permanent evil.
3. It has nothing to do with the sanctity of the Jagannath temple or the credulity of worshippers.
4. It s that the first of Lenin s three prerequisites for a revolutionary situation widespread discontent just cannot exist in this country.
(in numerical value)

A) 2 B) C) D)

Explanation:-
The correct sequence of statements in this case is 1-3-4. Statement 2 is the clear misfit here as it does not provide the substantial input required here. It talks in terms of a specific reason whereas the other three statements focus on the general scenario.

DIRECTIONS for question: *Four sentences related to a topic are given below. Three 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.*

Question No. : 30

1. Emma Donoghue s 2010 novel Room seemed like it was made for me.
2. After all, Room a formally inventive story about domesticity and sexuality falls into a category of books I love; what s more, Room asks us to perform the politically important task of closely examining women s experiences of all those topics.
3. What s not to love about a bestselling feminist novel about sex and motherhood?
4. The crux of my problem is the feature of Room I m supposed to admire most: the story s treatment of how Ma s mothering relates to her suffering.
(in numerical value)

A) 4 B) C) D)

Explanation:-
In this case, statements 1, 2 and 3 form the perfect opening for the paragraph and provide us the context for the discussion. Statement 4 is not related in the given context as it provides specific details about the book. This is something that does not feature in the other statements.

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 31

1. The accumulation of capital was of course necessary but so were a labor force and the existence of liquid water.
2. Oxygen is necessary for a fire.
3. The Great Enrichment did not come from piling brick on brick, or bachelor's degree on bachelor's degree, or bank balance on bank balance, but from piling idea on idea.
4. Contrary to economists from Adam Smith to Karl Marx to Thomas Piketty, our riches cannot be explained by the accumulation of capital, as the misleading word capitalism implies.
5. Yet it would be unhelpful to explain the Chicago Fire of October 8 10, 1871, by the presence of oxygen in the earth's atmosphere.

A) 43125 B) C) D)

Explanation:- *Statement 4 is the introductory sentence for the passage. Statement 3 takes the subject forward and statements 1-2-5 combine to form a mandatory pair (talking about a common subject). Combining the clues, we arrive at the correct answer: 43125*

DIRECTIONS for the question: *The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.*

Question No. : 32

1. He called his act the slaughter of the innocents.
2. Jesuits begin their study with a two-year novitiate period, during which Hopkins did not write a single line of verse in fact, he would only write fragments for the next seven years.
3. In this period, Hopkins struggled with the divergent pulls of poetry and prayer.
4.That tension coaxed his best and most unique material.
5. Gerard Manley Hopkins burned all of his poems before becoming a priest.

A) 51234 B) C) D)

Explanation:- *Statement 5 introduces the subject of the paragraph. Statement 1 describes his act. These two are the easy statements in the given context.*
The key fragment in statement 3 is in this period . This refers to the period of two years mentioned in statement 2. This gives us the second grouping: 2-3-4 and helps us identify the correct order: 51234.

DIRECTIONS for the question: *Identify the most appropriate summary for the paragraph and write the key for most appropriate option.*

Question No. : 33

When a man produces a greater quantity of any commodity than he desires for himself, it can only be on one account; namely, that he desires some other commodity which he can obtain in exchange for the surplus of what he himself has produced. It seems hardly necessary to offer any thing in support of so necessary a proposition; it would be inconsistent with the known laws of human nature to suppose, that a man would take the trouble to produce anything without desiring to have anything. If he desires one thing, and produces another, it is only because the thing which he desires can be obtained by means of the thing which he produces, and better obtained, than if he had endeavoured to produce it himself.

1. The purpose of producing something that is not desired can only to obtain something in exchange.
2. The purpose of producing something in excess that desired by oneself is to obtain something he desires in exchange for it.
3. The purpose of producing something that is desired can only to obtain something in exchange that is not desired.
4. The purpose of producing something is desired is further justified by exchanging it for something is also desired but not produced.

A) 2 B) C) D)

Explanation:-
Options 1 and 4 are illogical in the given case.
refer to the lines: When a man produces a greater quantity of any commodity than he desires for himself, it can only be on one account; namely, that he desires some other commodity which he can obtain in exchange for the surplus of what he himself has produced.
Option 2 is the perfect summary derived from the above lines.
Remember, the focus in the paragraph is on producing something extra for exchanging something; not just simply producing something. This makes option 2 the answer and helps us rule out option 3.

DIRECTIONS for the question: *Identify the most appropriate summary for the paragraph and write the key for most appropriate option.*

Question No. : 34

Coming from a scientist, this sounds smug, but here it is: science is one of humanity s most noble and successful endeavours, and our best way to learn how the world works. We know more than ever about our own bodies, the biosphere, the planet and even the cosmos. We take pictures of Pluto, unravel quantum mechanics, synthesise complex chemicals and can peer into (as well as manipulate) the workings of DNA, not to mention our brains and, increasingly, even our diseases. Sometimes science s very success causes trouble, it s true. Nuclear weapons perhaps the most immediate threat to life on Earth were a triumph for science. Then there are the paradoxical downsides of modern medicine, notably overpopulation, plus the environmental destruction that science has unwittingly promoted. But these are not the cause of the crisis faced by science today. Today science faces a crisis of legitimacy which is entirely centred on rampant public distrust and disavowal.

1. Science, without its successes and downfalls, faces the issue of public distrust because of its legitimacy
2. Science, despite its successes and downfalls, faces the issue of public distrust caused by its legitimacy
3. Science, irrespective of its successes and downfalls, faces the issue of legitimacy driven by public distrust
4. Science, despite its successes and downfalls, faces the issue of legitimacy driven by public distrust

A) 4 B) C) D)

Explanation:-
The question is driven by the lines: Today science faces a crisis of legitimacy which is entirely based on rampant public distrust and disavowal.
Option 4 summaries the paragraph best as it includes the first part of the paragraph as well (talking about the successes and failures of science).
Remember, the successes and failures of science cannot be discounted in this case and this why we select option 4 as the correct answer.

Section : DI & Reasoning

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

Question No. : 35

Four teams - A, B, C and D - participated in a three-day cricket tournament. Each team plays exactly one match on each day, i.e., day 1, day 2 and day 3, and plays with a different team on each day.

If B plays with A on day 2, which of the following statements is definitely true? (Answer in option)

1. If A plays with D on day 3, then C plays with B on day 1
2. If B plays with D on day 3, then C plays with B on day 1
3. C plays with D on day 3
4. B plays with D on day 1

A) 2 B) C) D)

Explanation:-
As each team plays with a different team on each day, each team plays three matches
Total instances = 3x4 = 12

But two teams participate in each match, total number of matches= $=\frac{12}{2}=6$
Every day two matches are held
As each team plays only one match on each day, if A plays with B on day x, C plays with D on day x.The following table represents the days on which the matches will be held

	A	B	C
B	x	-	-
C	y	z	-
D	z	y	x

Given x = 2 . From choice (A): z = 3 and z = 1.
Hence contradiction. From choice (B): y = 3. 2 = 1
Hence true. From choice (C); x = 3. false Choice (B)

Question No. : 36

Four teams - A, B, C and D - participated in a three-day cricket tournament. Each team plays exactly onematch on each day, i.e., day 1, day 2 and day 3, and plays with a different team on each day.

If C plays with D on the day after it plays with A, Then which of the following statements is definitely false? (Answer in option)

1. B plays with D on day 1
2. B plays with C on day 3
3. A plays with D on day 2
4. More than one of the above

A) 3 B) C) D)

Explanation:-
As each team plays with a different team on each day, each team plays three matches
Total instances = 3x4 = 12

But two teams participate in each match, total number of matches $=\frac{12}{2}=6$
Every day two matches are held
As each team plays only one match on each day, if A plays with B on day x, C plays with D on day x.The following table represents

the days on which the matches will b held

	A	B	C
B	x	-	-
C	y	z	-
D	z	y	x

Given x=y+1
If y=1, x=2 z=3
If y=2, x=3 z=1
y cannot be 3 and z cannot be 2.
From choice (A) : y=1
From choice (B) : z=3
From choice (C) : z=2,which is not possible from choice (D), y=1, which need not be definitely true. Choice (C)

Question No. : 37

Four teams - A, B, C and D - participated in a three-day cricket tournament. Each team plays exactly onematch on each day, i.e., day 1, day 2 and day 3, and plays with a different team on each day.

If A did not play with C on day 1 and B did not play with A on day 2, then who played against A on day 3?

A) B B) C C) D ✓D) Cannot be determined

Explanation:-
As each team plays with a different team on each day, each team plays three matches
Total instances = 3x4 = 12

But two teams participate in each match, total number of matches $=\frac{12}{2}=6$
Every day two matches are held
As each team plays only one match on each day, if A plays with B on day x, C plays with D on day x.The following table represents the days on which the matches will b held

	A	B	C
B	x	-	-
C	y	z	-
D	z	y	x

On day 1 A must have played with either B or D and on day 2 A must have played with either C or D. It A plays with D on day 1 then A must have played with C on day 2 and with B on day 3. However, if A plays with B on day 1 then A can play with either C or D day 2 A can play with either D or
C on day 3.Hence, the team against which A plays on day 3 cannot be determined.Choice (D)

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

Question No. : 38

In a school, there are seven classrooms, one each for classes I through VII. These classrooms were built around a circular garden such that classes I to VII are accommodated in that order. The following table gives the sum of the number of students in any group of three consecutively situated classes.

Classes	Total Students
I, II, III	300

II, III, IV	280
III, IV, V	240
IV, V, VI	195
V, VI, VII	215
VI, VII, I	235
VII, I, II	260

The percentage of girls in different classes are 30%, 40%, 44%, 45%, 50%, 55% and 60%, not necessarily in any order.

At least how many classes contain more than 30 girls?

A) 3 B) C) D)

Explanation:-

The total strength of the school is $\frac{300+195+260+240+235+280+215}{3}=575.$

Strength of class I = 575 (II, III, IV, V, VI, VII) = 575 (280 + 215) = 80.
Similarly the strengths of classes II, III, IV, V, VI and VII are 100, 120, 60, 60, 75 and 80 respectively.
For the cases in which the percentage of girls is 60 and 55, the number of girls will be more than 30(minimum possible is $\frac{55\times60}{100}=33$ *)*
Also for the class which has 44% of girls, the total number of students will be 75 or 100 (only then the number of girls is an integer)
$\therefore$ Minimum possible $=\frac{75\times44}{100}=33$
Hence, there are at least three such classes and the following is one of the possible cases:

I. 30% of 80 = 24
II. 44% of 100 = 44
III. 60% of 120 = 72
IV. 50% of 60 = 30
V. 45% of 60 = 27
VI. 40% of 75 = 30
VII. 55% of 80 = 44

Here only classes II, III and VII have more than 30 girls.

Question No. : 39

What is the maximum possible difference between the number of boys in one class and the number of girls in another class?

A) 60 B) C) D)

Explanation:-
Minimum possible number of girls in any class = 30% of 60 = 18.
The maximum possible number of boys in other class = (100-40)% of 120 = 72
Difference = 54
Similarly, Maximum possible number of boys = (100 -30)% of 120 = 84.
Then minimum possible girls = 40% of 60 = 24.
difference = 60.
Also, maximum possible number of girls = 60% of 120 = 72.
Then minimum boys = (100 55)% of 60 = 27
difference = 45
Also, minimum possible number of boys = (100-60)% of 60 = 24.
Then maximum girls = 55% of 120 = 66
difference = 42
Maximum possible difference is 60.

Question No. : 40

If it is known that *x* classes have an equal number of girls, then what is the maximum possible value of x?

A) 2 ✓B) 3 C) 4 D) 5

Explanation:-
The possible number of girls for I, VII 24,32,36,40,44,48
II 30,40, 44,45, 50, 55, 60
III 36,48,54,60,66,72
IV, V-18, 24, 27, 30, 33, 36
VI 30, 33, 45
Here, only 30 (or 36) can occur for 3 times,

(1) <u>for 30 girls</u>
II- 30% of 100 = 30
IV- 50% of 60 = 30
V- 40% of 75 = 30
But 44% cannot take any other class to get an integer.

(2) <u>For 36 girls</u>
I ? 45% of 80 = 36
III ?30% of 120 = 36
IV ??60% of 60 = 36
It is a possible case. Hence maximum is three.

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

Question No. : 41

Four exams are to be ranked from 1 to 4 on the basis of the number of test takers - the one with the highest number of test takers being ranked 1 and the one with the least number of test takers, being ranked 4. The exams to be ranked are MAGT. REG, TILES and FELTO.

The following data is known regarding the ranking:

(a) If MAGT is ranked 1. then REG is not ranked 3.
(b) If REG is not ranked 1, then FELTO is ranked 4.
(c) If TILES is ranked 3, then FELTO is not ranked 2.
(d) If TILES is not ranked 2, the FELTO is ranked 2.
(e) If FELTO is ranked 3, then MAGT is not ranked 4.

Which exam has the highest number of test takers?

A) MAGT ✓B) REG C) TILES D) FELTO

Explanation:-
From D, we know that either TILES or FELTO should be ranked 2.
Possibility 1:
TILES Is ranked 2: If we assume that MAGT is ranked 1, then REG gets rank 4 (from (a)), but this is contradicted by B, MAGT cannot be ranked 1.
As per (b), in case REG is not ranked 1. then FELTO is ranked 4, which means REG is ranked 3 and MAGT is ranked 1, which is not possible. Hence, REG has to be ranked 1. We can have FELTO as rank 3, which means that MAGT has to be ranked 4, but this is contradicted by (e). Hence. FELTO has to be ranked 4 and MAGT has to be ranked 3.
The order will be

Rank	1	2	3	4

Exam	REG	TILES	MAGT	FELTO

Possibility 2:
FELTO is ranked 2: As seen earlier, MAGT cannot get 1st rank, as it would contradict the other given conditions. Hence REG is ranked 1. From C, we know that TILES cannot be ranked 3 as in that case FELTO cannot be ranked 2. Hence TILES has to be ranked 4. This leaves MAGT with rank 3.
The order will be

Rank	1	2	3	4
Exam	REG	FELTO	MAGT	TILES

In both the cases, REG has the highest number of test takers.
Choice (B)

Question No. : 42

Which exam has the least number of test takers?

A) FELTO B) TILES C) REG ✓D) Cannot be determined

Explanation:-
From D, we know that either TILES or FELTO should be ranked 2.
Possibility 1:
TILES Is ranked 2: If we assume that MAGT is ranked 1, then REG gets rank 4 (from (a)), but this is contradicted by B, MAGT cannot be ranked 1.
As per (b), in case REG is not ranked 1. then FELTO is ranked 4, which means REG is ranked 3 and MAGT is ranked 1, which is not possible. Hence, REG has to be ranked 1. We can have FELTO as rank 3, which means that MAGT has to be ranked 4, but this is contradicted by (e). Hence. FELTO has to be ranked 4 and MAGT has to be ranked 3.
The order will be

Rank	1	2	3	4
Exam	REG	TILES	MAGT	FELTO

Possibility 2:
FELTO is ranked 2: As seen earlier, MAGT cannot get 1SI rank, as it would contradict the other given conditions. Hence REG is ranked 1. From C, we know that TILES cannot be ranked 3 as in that case FELTO cannot be ranked 2. Hence TILES has to be ranked 4. This leaves MAGT with rank 3.
The order will be

Rank	1	2	3	4
Exam	REG	FELTO	MAGT	TILES

The exam with the least number of test takers is either FELTO or TILES. Choice (D)

Question No. : 43

Which exam is ranked third?

A) FELTO B) TILES C) REG ✓D) MAGT

Explanation:-
From D, we know that either TILES or FELTO should be ranked 2.
Possibility 1:
TILES Is ranked 2: If we assume that MAGT is ranked 1, then REG gets rank 4 (from (a)), but this is contradicted by B, MAGT cannot be ranked 1.
As per (b), in case REG is not ranked 1. then FELTO is ranked 4, which means REG is ranked 3 and MAGT is ranked 1, which is not possible. Hence, REG has to be ranked 1. We can have FELTO as rank 3, which means that MAGT has to be ranked 4, but this is contradicted by (e). Hence. FELTO has to be ranked 4 and MAGT has to be ranked 3.

The order will be

Rank	1	2	3	4
Exam	REG	TILES	MAGT	FELTO

Possibility 2:
FELTO is ranked 2: As seen earlier, MAGT cannot get 1SI rank, as it would contradict the other given conditions. Hence REG is ranked 1. From C, we know that TILES cannot be ranked 3 as in that case FELTO cannot be ranked 2. Hence TILES has to be ranked 4. This leaves MAGT with rank 3.
The order will be

Rank	1	2	3	4
Exam	REG	FELTO	MAGT	TILES

In both the cases, MAGT is ranked third. Choice (D)

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

Question No. : 44

Mr. Radhey Shyam invited his sons Pawan, Qureshi, Ramji, Shyam, Tara Chand and his ten grand children Alpha, Beta, Cita, Delta, Eita, Fanta, Gieata, Helta, Iiota and Joie i.e. on the occasion of Diwali Pooja. The following table gives the number of three different Sweets Kaju Barfi, Sandesh and Gulab Jamun that each child ate after Diwali Pooja. The second table gives the total number of sweets each of three types eaten by the children of his sons. Further it is known that at least one son has three children.

Child	Kaju Barfi	Sandesh	Gulab Jamun
Alpha	0	0	1
Beta	0	1	0
Cita	1	0	0
Delta	1	0	1
Eita	1	1	0
Fanta	0	1	1
Gieta	1	1	1
Helta	2	0	1
Iiota	1	0	2
Joie	1	2	0

Children of	Flavour		
	Kaju Barfi	Sandesh	Gulab Jamun
Pawan	2	2	2
Qureshi	1	0	1
RamjI	1	2	1
Shyam	3	1	1
Tara Chand	1	1	2

Who among the following can be the Father of Eita?

A) Pawan B) Qureshi ✓C) Ram ji D) More than one of the above

Explanation:-

It is given that at least one son has three children which means at least one Son must have exactly one child.
By observation, only Qureshi can possibly have exactly one child i.e. Delta). Hence, at most one of the other Sons can have three children.
Delta must be the only child of Qureshi.
It can also be observed that the possible combinations of Shyam children are (Helta, Eita/ Helta, Beta, Cita)
The feasible cases of Qureshi children and Shyam's children are

Case-I	**Case-II**
Qureshi -Delta	Qureshi - Delta
Shyam - Helta, Eita	Shyam- Helta, Beta, Cita

Further, the number of Gulab Jamun eaten by Iiota is 2.
Iiota must be a child of Pawan or Tara Chand (1)
Also, the number of Sandesh eaten by Joie is 2.
Joie must be a child of Pawan or RamjI (2)
Now, we assess each case, as follows

Case-I

From (1) Iiota must be child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. The number of Gulab Jamun eaten by Pawan children is 2 and the number of Gulab Jamun eaten by Iiota is 2.
The number of Gulab Jamun eaten by the remaining children of Pawan is 0.
Of the remaining only Beta, Cita and Joie can be the children of Pawan and of them the only possible combination is Iiota, Joie.
Of the remaining the possible combinations of Ramji children are (Beta, Gieta)/(Beta, Cita, Fanta).
Of the remaining the possible combinations of Tara Chand children are (Alpha, Cita, Fanta)/(Alpha, Gieta)
The feasible solutions of case-I (a) are .

(1) Pawan Iiota, Joie	(2) Pawan- Iiota, Joie
Qureshi Delta	Qureshi Delta
Ramji Beta, Gieta	Ramji Beta, Cita, Fanta
Shyam Helta, Eita	Shyam Helta, Eita
Tara Chand Alpha, Cita, Fanta	Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. The only possible combination of Tara Chand children is Iiota, Beta. Of the remaining the possible combination of Ramji s children are Alpha, Joie. The feasible solutions of case-I (b) are

(1) Pawan Cita, Fanta, Gieta
Qureshi Delta
Ramji Alpha, Joie
Shyam- Helta, Eita
Tara Chand Iiota, Beta

Case-II

From (1) Iiota, must be a child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. Working similarly as in above cases, we get the feasible solution of case-II(a) is
(1) Pawan Iiota, Joie
Qureshi-Delta
Ramji- Eita, Fanta
Shyam-Helta, Beta, Cita
Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. Then Beta has to be the other child of Tara Chand which is not possible because

Beta is a child of Shyam.
There are no feasible solutions for this case.
The total number of feasible solutions are 4 and they are

Family Possibilities	Pawan	Qureshi	Ramji	Shyam	Tara Chand
I	Iiota, Joe	Delta	Beta, Gieta	Helta, Eita	Alpha, Cita,Fanta
II	Iiota, Joie	Delta	Beta, Cita, Fanta	Helta,Eita	Alpha,Gieta
III	Gieta, Fanta, Cita	Delta	Alpha, Joie	Helta,Eita	Iiota,Beta
IV	Iiota, Joit	Delta	Eita,Fanta	Helta,Beta, Cita	Alpha,Gieta

Ram ji can be the father of Eita. Hence option (3)

Question No. : 45

Who among the following is the Father of Delta?

A) Pawan ✓B) Qureshi C) Ram ji D) More than one of the above

Explanation:-
It is given that at least one son has three children which means at least one Son must have exactly one child.
By observation, only Qureshi can possibly have exactly one child i.e. Delta). Hence, at most one of the other Sons can have three children.
Delta must be the only child of Qureshi.
It can also be observed that the possible combinations of Shyam children are (Helta, Eita/ Helta, Beta, Cita)
The feasible cases of Qureshi children and Shyam's children are

Case-I	Case-II
Qureshi -Delta	Qureshi - Delta
Shyam - Helta, Eita	Shyam- Helta, Beta, Cita

Further, the number of Gulab Jamun eaten by Iiota is 2.
Iiota must be a child of Pawan or Tara Chand (1)
Also, the number of Sandesh eaten by Joie is 2.
Joie must be a child of Pawan or RamjI (2)
Now, we assess each case, as follows

Case-I
From (1) Iiota must be child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. The number of Gulab Jamun eaten by Pawan children is 2 and the number of Gulab Jamun eaten by Iiota is 2.
The number of Gulab Jamun eaten by the remaining children of Pawan is 0.
Of the remaining only Beta, Cita and Joie can be the children of Pawan and of them the only possible combination is Iiota, Joie.
Of the remaining the possible combinations of Ramji children are (Beta, Gieta)/(Beta, Cita, Fanta).
Of the remaining the possible combinations of Tara Chand children are (Alpha, Cita, Fanta)/(Alpha, Gieta)
The feasible solutions of case-I (a) are .

(1) Pawan Iiota, Joie	(2) Pawan- Iiota, Joie
Qureshi Delta	Qureshi Delta

Ramji	Beta, Gieta	Ramji	Beta, Cita, Fanta
Shyam	Helta, Eita	Shyam	Helta, Eita
Tara Chand	Alpha, Cita, Fanta	Tara Chand	Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. The only possible combination of Tara Chand children is Iiota, Beta. Of the remaining the possible combination of Ramji s children are Alpha, Joie. The feasible solutions of case-I (b) are

(1) Pawan Cita, Fanta, Gieta
Qureshi Delta
Ramji Alpha, Joie
Shyam- Helta, Eita
Tara Chand Iiota, Beta

Case-II

From (1) Iiota, must be a child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. Working similarly as in above cases, we get the feasible solution of case-II(a) is
(1) Pawan Iiota, Joie
Qureshi-Delta
Ramji- Eita, Fanta
Shyam-Helta, Beta, Cita
Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. Then Beta has to be the other child of Tara Chand which is not possible because Beta is a child of Shyam.
There are no feasible solutions for this case.
The total number of feasible solutions are 4 and they are

Family / Possibilities	Pawan	Qureshi	Ramji	Shyam	Tara Chand
I	Iiota, Joe	Delta	Beta, Gieta	Helta, Eita	Alpha, Cita,Fanta
II	Iiota, Joie	Delta	Beta, Cita, Fanta	Helta,Eita	Alpha,Gieta
III	Gieta, Fanta, Cita	Delta	Alpha, Joie	Helta,Eita	Iiota,Beta
IV	Iiota, Joit	Delta	Eita,Fanta	Helta,Beta, Cita	Alpha,Gieta

Qureshi is the Father of Delta. Hence option (2)

Question No. : 46

If Iiota is the son of Tara Chand, then who among the following must be the child of Ramji?

A) Gieta ✓B) Alpha C) Beta D) More than one of the above

Explanation:-

It is given that at least one son has three children which means at least one Son must have exactly one child.
By observation, only Qureshi can possibly have exactly one child i.e. Delta). Hence, at most one of the other Sons can have three children.
Delta must be the only child of Qureshi.
It can also be observed that the possible combinations of Shyam children are (Helta, Eita/ Helta, Beta, Cita)
The feasible cases of Qureshi children and Shyam's children are

Case-I	Case-II
Qureshi -Delta	Qureshi - Delta
Shyam - Helta, Eita	Shyam- Helta, Beta, Cita

Further, the number of Gulab Jamun eaten by Iiota is 2.
Iiota must be a child of Pawan or Tara Chand (1)
Also, the number of Sandesh eaten by Joie is 2.
Joie must be a child of Pawan or RamjI (2)
Now, we assess each case, as follows

Case-I
From (1) Iiota must be child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. The number of Gulab Jamun eaten by Pawan children is 2 and the number of Gulab Jamun eaten by Iiota is 2.
The number of Gulab Jamun eaten by the remaining children of Pawan is 0.
Of the remaining only Beta, Cita and Joie can be the children of Pawan and of them the only possible combination is Iiota, Joie.
Of the remaining the possible combinations of Ramji children are (Beta, Gieta)/(Beta, Cita, Fanta).
Of the remaining the possible combinations of Tara Chand children are (Alpha, Cita, Fanta)/(Alpha, Gieta)
The feasible solutions of case-I (a) are .

(1) Pawan Iiota, Joie	(2) Pawan- Iiota, Joie
Qureshi Delta	Qureshi Delta
Ramji Beta, Gieta	Ramji Beta, Cita, Fanta
Shyam Helta, Eita	Shyam Helta, Eita
Tara Chand Alpha, Cita, Fanta	Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. The only possible combination of Tara Chand children is Iiota, Beta. Of the remaining the possible combination of Ramji s children are Alpha, Joie. The feasible solutions of case-I (b) are

(1) Pawan Cita, Fanta, Gieta
Qureshi Delta
Ramji Alpha, Joie
Shyam- Helta, Eita
Tara Chand Iiota, Beta
Case-II
From (1) Iiota, must be a child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. Working similarly as in above cases, we get the feasible solution of case-II(a) is
(1) Pawan Iiota, Joie
Qureshi-Delta
Ramji- Eita, Fanta
Shyam-Helta, Beta, Cita
Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. Then Beta has to be the other child of Tara Chand which is not possible because Beta is a child of Shyam.
There are no feasible solutions for this case.
The total number of feasible solutions are 4 and they are

Family / Possibilities	Pawan	Qureshi	Ramji	Shyam	Tara Chand
I	Iiota, Joe	Delta	Beta, Gieta	Helta, Eita	Alpha, Cita,Fanta

II	Iiota, Joie	Delta	Beta, Cita, Fanta	Helta,Eita	Alpha,Gieta
III	Gieta, Fanta, Cita	Delta	Alpha, Joie	Helta,Eita	Iiota,Beta
IV	Iiota, Joit	Delta	Eita,Fanta	Helta,Beta, Cita	Alpha,Gieta

If Iiota is the son of Tara Chand, then Alpha is the child of Ram Ji. Hence option (2)

Question No. : 47

If Beta is the Son of RamJi, then who among the following must be the child of Tara Chand?

✓A) Alpha B) Cita C) Gieta D) More than one of the above

Explanation:-
It is given that at least one son has three children which means at least one Son must have exactly one child.
By observation, only Qureshi can possibly have exactly one child i.e. Delta). Hence, at most one of the other Sons can have three children.
Delta must be the only child of Qureshi.
It can also be observed that the possible combinations of Shyam children are (Helta, Eita/ Helta, Beta, Cita)
The feasible cases of Qureshi children and Shyam's children are

Case-I	**Case-II**
Qureshi -Delta	Qureshi - Delta
Shyam - Helta, Eita	Shyam- Helta, Beta, Cita

Further, the number of Gulab Jamun eaten by Iiota is 2.
Iiota must be a child of Pawan or Tara Chand (1)
Also, the number of Sandesh eaten by Joie is 2.
Joie must be a child of Pawan or RamjI (2)
Now, we assess each case, as follows

Case-I
From (1) Iiota must be child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. The number of Gulab Jamun eaten by Pawan children is 2 and the number of Gulab Jamun eaten by Iiota is 2.
The number of Gulab Jamun eaten by the remaining children of Pawan is 0.
Of the remaining only Beta, Cita and Joie can be the children of Pawan and of them the only possible combination is Iiota, Joie.
Of the remaining the possible combinations of Ramji children are (Beta, Gieta)/(Beta, Cita, Fanta).
Of the remaining the possible combinations of Tara Chand children are (Alpha, Cita, Fanta)/(Alpha, Gieta)
The feasible solutions of case-I (a) are .

(1) Pawan Iiota, Joie	(2) Pawan- Iiota, Joie
Qureshi Delta	Qureshi Delta
Ramji Beta, Gieta	Ramji Beta, Cita, Fanta
Shyam Helta, Eita	Shyam Helta, Eita
Tara Chand Alpha, Cita, Fanta	Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. The only possible combination of Tara Chand children is Iiota, Beta. Of the remaining the possible combination of Ramji s children are Alpha, Joie. The feasible solutions of case-I (b) are

(1) Pawan Cita, Fanta, Gieta

Qureshi Delta
Ramji Alpha, Joie
Shyam- Helta, Eita
Tara Chand Iiota, Beta

Case-II

From (1) Iiota, must be a child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. Working similarly as in above cases, we get the feasible solution of case-II(a) is
(1) Pawan Iiota, Joie
Qureshi-Delta
Ramji- Eita, Fanta
Shyam-Helta, Beta, Cita
Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. Then Beta has to be the other child of Tara Chand which is not possible because Beta is a child of Shyam.
There are no feasible solutions for this case.
The total number of feasible solutions are 4 and they are

Family / Possibilities	Pawan	Qureshi	Ramji	Shyam	Tara Chand
I	Iiota, Joe	Delta	Beta, Gieta	Helta, Eita	Alpha, Cita,Fanta
II	Iiota, Joie	Delta	Beta, Cita, Fanta	Helta,Eita	Alpha,Gieta
III	Gieta, Fanta, Cita	Delta	Alpha, Joie	Helta,Eita	Iiota,Beta
IV	Iiota, Joit	Delta	Eita,Fanta	Helta,Beta, Cita	Alpha,Gieta

If Beta is the Son of RamJi, then Alpha must be the child of Tara Chand. Hence option (1)

Question No. : 48

If Shyam has three children, then Eita must be the child of

✓A) Ramji B) Pawan C) Shyam D) Cannot be determined

Explanation:-

It is given that at least one son has three children which means at least one Son must have exactly one child.
By observation, only Qureshi can possibly have exactly one child i.e. Delta). Hence, at most one of the other Sons can have three children.
Delta must be the only child of Qureshi.
It can also be observed that the possible combinations of Shyam children are (Helta, Eita/ Helta, Beta, Cita)
The feasible cases of Qureshi children and Shyam's children are

Case-I	Case-II
Qureshi -Delta	Qureshi - Delta
Shyam - Helta, Eita	Shyam- Helta, Beta, Cita

Further, the number of Gulab Jamun eaten by Iiota is 2.
Iiota must be a child of Pawan or Tara Chand (1)
Also, the number of Sandesh eaten by Joie is 2.
Joie must be a child of Pawan or RamJI (2)

Now, we assess each case, as follows

Case-I

From (1) Iiota must be child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. The number of Gulab Jamun eaten by Pawan children is 2 and the number of Gulab Jamun eaten by Iiota is 2.
The number of Gulab Jamun eaten by the remaining children of Pawan is 0.
Of the remaining only Beta, Cita and Joie can be the children of Pawan and of them the only possible combination is Iiota, Joie.
Of the remaining the possible combinations of Ramji children are (Beta, Gieta)/(Beta, Cita, Fanta).
Of the remaining the possible combinations of Tara Chand children are (Alpha, Cita, Fanta)/(Alpha, Gieta)
The feasible solutions of case-I (a) are .

(1) Pawan Iiota, Joie	(2) Pawan- Iiota, Joie
Qureshi Delta	Qureshi Delta
Ramji Beta, Gieta	Ramji Beta, Cita, Fanta
Shyam Helta, Eita	Shyam Helta, Eita
Tara Chand Alpha, Cita, Fanta	Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. The only possible combination of Tara Chand children is Iiota, Beta. Of the remaining the possible combination of Ramji s children are Alpha, Joie. The feasible solutions of case-I (b) are

(1) Pawan Cita, Fanta, Gieta
Qureshi Delta
Ramji Alpha, Joie
Shyam- Helta, Eita
Tara Chand Iiota, Beta

Case-II

From (1) Iiota, must be a child of Pawan or Tara Chand.
(a) Let us assume Iiota is a child of Pawan. Working similarly as in above cases, we get the feasible solution of case-II(a) is
(1) Pawan Iiota, Joie
Qureshi-Delta
Ramji- Eita, Fanta
Shyam-Helta, Beta, Cita
Tara Chand Alpha, Gieta

(b) Let us assume Iiota is a child of Tara Chand. Then Beta has to be the other child of Tara Chand which is not possible because Beta is a child of Shyam.
There are no feasible solutions for this case.
The total number of feasible solutions are 4 and they are

Family / Possibilities	Pawan	Qureshi	Ramji	Shyam	Tara Chand
I	Iiota, Joe	Delta	Beta, Gieta	Helta, Eita	Alpha, Cita,Fanta
II	Iiota, Joie	Delta	Beta, Cita, Fanta	Helta,Eita	Alpha,Gieta
III	Gieta, Fanta, Cita	Delta	Alpha, Joie	Helta,Eita	Iiota,Beta
IV	Iiota, Joit	Delta	Eita,Fanta	Helta,Beta, Cita	Alpha,Gieta

If Shyam has three children, then Eita must be the child of Ram Ji. Hence option (1)

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

Question No. : 49

Researches know that exactly six prehistoric iron-working sites - Q, R, S, T, V and X existed in the Windham area. Recently, the researchers have discovered three objects 1, 2 and 3 that they know must have been made by iron-workers in the Windham area. The researchers would now like to determine the specific site at which each object was made. The objects are different enough in composition and style to leave no doubt that each was made at a different site. In addition, the researchers have established the following

I. If any of the objects was made at Q, none of them was made at T.
II. If any of the objects was made at R, none of them was made at S.
III. One of the objects was made at V
IV. Object 2 was not made at X.
V. Object 3 was made neither at S nor at X

If neither Q nor T was a site at which any of the objects was made, which of the following must be true?

✓A) Object 1 was made at X B) Object 2 was made at S C) Object 2 was made at V D) Object 3 was made at R

Explanation:-
From the given information only Object 1 was made at X. Object 2 could have been made at S, V or R and Object 3 could have been made at V or R.
Hence, the correct answer is option A.

Question No. : 50

Researches know that exactly six prehistoric iron-working sites - Q, R, S, T, V and X existed in the Windham area. Recently, the researchers have discovered three objects 1, 2 and 3 that they know must have been made by iron-workers in the Windham area. The researchers would now like to determine the specific site at which each object was made. The objects are different enough in composition and style to leave no doubt that each was made at a different site. In addition, the researchers have established the following

I. If any of the objects was made at Q, none of them was made at T.
II. If any of the objects was made at R, none of them was made at S.
III. One of the objects was made at V
IV. Object 2 was not made at X.
V. Object 3 was made neither at S nor at X

If Object 1 was made at T, Object 3 could have made at which of the following site?

A) Q ✓B) R C) S D) X

Explanation:-
From the given information Object 3 was not made at Q, S and X. So it was made at R.

Question No. : 51

Researches know that exactly six prehistoric iron-working sites - Q, R, S, T, V and X existed in the Windham area. Recently, the researchers have discovered three objects 1, 2 and 3 that they know must have been made by iron-workers in the Windham area. The researchers would now like to determine the specific site at which each object was made. The objects are different enough in composition and style to leave no doubt that each was made at a different site. In addition, the researchers have established the following

I. If any of the objects was made at Q, none of them was made at T.
II. If any of the objects was made at R, none of them was made at S.
III. One of the objects was made at V
IV. Object 2 was not made at X.

V. Object 3 was made neither at S nor at X

Object 1, Object 2, and Object 3 respectively could have been made at

A) Q, S and X B) R, X and V C) T, V and S ✓D) V, S and Q

Explanation:-
Check choices. According to Given information, only option (D) is valid.

DIRECTIONS for the question: *Study the table/s given below and answer the question that follows.*

Question No. : 52

The table below provides the information on some of the leading Thai cuisine restaurants in Delhi.

Name of restaurant	Food	Decor	Service	Price	Music	Liquor	No smoking facility
Baan Thai	4.5	4.5	4	2000-2400	No	Yes	Yes
Sukhothai	3.5	3	3	600-800	Yes	Yes	No
Blue Elephant	3.5	5	3	2000-3000	No	Yes	Yes
Spice	3.5	3.5	3	1000-2000	No	No	Yes
Spice Route	3.5	5	3	1200-2000	Yes	Yes	Yes
Turquoise Cottage	2.5	3.5	3.5	800-1000	No	No	Yes

Arindam and Suzy are Thai food lovers. Food, decor and service are the only factors for Arindam to choose a restaurant, while for Suzy, price is also an additional factor. Arindam does not visit a restaurant without a 'no smoking zone', while Suzy does not enjoy visiting a restaurant playing music. The figures in the columns under Food, Decor and Service refer to ratings for the same on a scale of 5 with 1 being the worst and 5 the best. The price refers to price of average meal for two persons.

The consolidated rating for the restaurant is the weighted sum of food, decor and service. If decor was twice as important as both food and service, which restaurant is Arindam most likely to visit?

A) Sukhothai B) Spice Route ✓C) Baan Thai D) Blue Elephant

Explanation:-
Since Arindam does not visit places without no smoking zone , Sukhothai or (a) gets eliminated. For the other three options, the objective is to identify the consolidated rating for (Food) + (2 D cor) + (Service)
Spice Route = 3.5 + 2 5 + 3 = 16.5
Bann Thai = 4.5 + 2 4.5 + 4 = 17.5
Blue Elephant = 3.5 + 2 5 + 3 = 16.5
Since 17.5 > 16.5, the right answer is (C).

Question No. : 53

A Common Friend wants to treat both Arindam and Suzy together for liquor and dinner. Which are the two likely restaurant options are available for them to go to?

A) Spice or Spice Route B) Baan Thai or Sukhothai ✓C) Baan Thai or Blue Elephant D) Spice or Blue Elephant

Explanation:-
Since Suzy does not visit a restaurant with music, Sukhothai and Spice Route and eliminated. Since Arindam does not visit a restaurant without a no smoking zone , Sukhothai is eliminated. Since liquor is on the agenda, Spice is eliminated. Hence, among the choices, (A),(B) and (D) are eliminated.
Hence, the common friend is likely to treat Suzy and Arindam at Baan Thai or Blue Elephant. The right answer is thus (C)

Question No. : 54

Assuming a total budget of Rs. 1,150 and relative weightages for food, decor and service being in the proportion 2 : 1: 2, what should be the restaurant to choose for the two people on the basis of consolidated rating (Given the consolidated rating for the restaurant is the weighted sum of food, decor and service)?

A) Turquoise Cottage B) Spice Route C) Sukhothai ✓D) Spice

Explanation:-
Since the budget is Rs. 1,150, the only restaurants which cater to that budget are Sukhothai, Spice and Turquoise Cottage.
Consolidated rating for Sukhothai = 2 3.5 + 1 3 + 2 3= 16
Consolidated rating for Spice = 2 3.5 + 1 3.5 + 2 3 = 16.5
Consolidated rating for Turquoise Cottage = 2 2.5+1 3.5 + 2 3.5 = 15.5
Since 16.5 is the highest rating, the right answer is (D).

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

Question No. : 55

In the Bulls Eye quiz contest, five teams from different colleges from North, South, West, East and Central zone of India came. The following facts were seen:

1. South and west teams spoke in English, but when the team from east joined them they started talking in Bengali.
2. The team from North, south, Central knew Hindi.
3. The common language between the team from west and central is Marathi.
4. Three teams can speak Urdu.
5. The language spoken by most number of teams is Bengali.
6. One team can speak all five languages.
7. One team can speak four languages.
8. One team can speak three languages.
9. One team can speak two languages.
10. One team can speak only one language.

Which teams can speak all the languages?

A) North ✓B) South C) West D) Cannot be determined

Explanation:-

From clues 1, 2 and 3, we know that South speaks English, Bengali and Hindi, West speaks English, Bengali and Marathi, East speaks Bengali, North speaks Hindi and Central speaks Hindi and Marathi. From clue 3, since the only common language between West and Central is Marathi, we can conclude that West does not speak Hindi and Central does not speak English or Bengali. So, either one of them speaks Urdu or none of them speaks Urdu. From clues 4 and 5, Urdu is spoken by 3 and Bengali is spoken by the maximum number of teams ⇒ Bengali is spoken by 4 teams and North speaks Bengali. Now, East must speak exactly 1 language, as all the other teams speak at least 2 languages. For Urdu, 2 teams must be North and South and the 3rd team must be one of West and Central. Now, North, South and West speak at least 3 languages ⇒ Central speaks exactly 2 (Hindi and Marathi) ⇒ West must speak Urdu and therefore 4 languages. Thus, South must speak all 5 languages and North speaks only 3 languages. Based on this, we can make a table as follows:

	E	B	H	M	U
N	×	√	√	×	√
S	√	√	√	√	√
W	√	√	×	√	√
E	×	√	×	×	×
C	×	×	√	√	×

South speaks all 5 languages.

Question No. : 56

In the Bulls Eye quiz contest, five teams from different colleges from North, South, West, East and Central zone of India came. The following facts were seen:

1. South and west teams spoke in English, but when the team from east joined them they started talking in Bengali.
2. The team from North, south, Central knew Hindi.
3. The common language between the team from west and central is Marathi.
4. Three teams can speak Urdu.
5. The language spoken by most number of teams is Bengali.
6. One team can speak all five languages.
7. One team can speak four languages.
8. One team can speak three languages.
9. One team can speak two languages.
10. One team can speak only one language.

What is the language spoken by least number of teams?

A) Marathi B) Urdu ✓C) English D) Cannot be determined

Explanation:-

From clues 1, 2 and 3, we know that South speaks English, Bengali and Hindi, West speaks English, Bengali and Marathi, East speaks Bengali, North speaks Hindi and Central speaks Hindi and Marathi. From clue 3, since the only common language between West and Central is Marathi, we can conclude that West does not speak Hindi and Central does not speak English or Bengali. So, either one of them speaks Urdu or none of them speaks Urdu. From clues 4 and 5, Urdu is spoken by 3 and Bengali is spoken by the maximum number of teams ⇒ Bengali is spoken by 4 teams and North speaks Bengali. Now, East must speak exactly 1 language, as all the other teams speak at least 2 languages. For Urdu, 2 teams must be North and South and the 3rd team must be one of West and Central. Now, North, South and West speak at least 3 languages ⇒ Central speaks exactly 2 (Hindi and Marathi) ⇒ West must speak Urdu and therefore 4 languages. Thus, South must speak all 5 languages and North speaks only 3 languages. Based on this, we can make a table as follows:

	E	B	H	M	U
N	×	√	√	×	√
S	√	√	√	√	√
W	√	√	×	√	√
E	×	√	×	×	×
C	×	×	√	√	×

English is spoken only by two teams South and West.

Question No. : 57

In the Bulls Eye quiz contest, five teams from different colleges from North, South, West, East and Central zone of India came. The following facts were seen:

1. South and west teams spoke in English, but when the team from east joined them they started talking in Bengali.
2. The team from North, south, Central knew Hindi.
3. The common language between the team from west and central is Marathi.
4. Three teams can speak Urdu.
5. The language spoken by most number of teams is Bengali.
6. One team can speak all five languages.
7. One team can speak four languages.
8. One team can speak three languages.
9. One team can speak two languages.
10. One team can speak only one language.

What are the common languages spoken by the teams from North and West?

A) Hindi and Urdu ✓B) Bengali and Urdu C) Hindi, Marathi, Urdu D) Cannot be determined

Explanation:-

From clues 1, 2 and 3, we know that South speaks English, Bengali and Hindi, West speaks English, Bengali and Marathi, East speaks Bengali, North speaks Hindi and Central speaks Hindi and Marathi. From clue 3, since the only common language between West and Central is Marathi, we can conclude that West does not speak Hindi and Central does not speak English or Bengali. So, either one of them speaks Urdu or none of them speaks Urdu. From clues 4 and 5, Urdu is spoken by 3 and Bengali is spoken by the maximum number of teams ⇒ Bengali is spoken by 4 teams and North speaks Bengali. Now, East must speak exactly 1 language, as all the other teams speak at least 2 languages. For Urdu, 2 teams must be North and South and the 3rd team must be one of West and Central. Now, North, South and West speak at least 3 languages ⇒ Central speaks exactly 2 (Hindi and Marathi) ⇒ West must speak Urdu and therefore 4 languages. Thus, South must speak all 5 languages and North speaks only 3 languages. Based on this, we can make a table as follows:

	E	B	H	M	U
N	×	√	√	×	√
S	√	√	√	√	√
W	√	√	×	√	√
E	×	√	×	×	×
C	×	×	√	√	×

The common languages between North and West are Bengali and Urdu.

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

Question No. : 58

Some people believe that January 1, 2000, is the first day of the 21st century. Other people feel that the honour belongs to January 1,2001. But everyone should agree that January 1,2002, is the first 'Sum-Day' of the new century. When you write out that date in (dd/mm/yy) notation it becomes 01/01/02, and 1 + 1 = 2. More generally, a 'Sum-Day' is a date in which the day and the month add up to the year, only last two digits of the year is taken into account.

How many 'Sum-Day' are there in the period January 01, 2000 to December 31,2010? (in numerical value)

A) 45 B) C) D)

Explanation:-

Here, time period would be 01/01/02 to 31/12/10
Hence, in MM/DD/YY notation, when YY = 00 and YY = 01, we cannot have a pair since = DD = 00 or M = 00 is not possible.
When YY = 02, we have pairs 01/01 ..... 1 number
When YY = 03, we have pairs (01/02, 02/01)...2 numbers.
When YY = 04, we have pairs (01/03, 03/01, 02/02)..... 3 numbers
When YY = 05, we have pairs (01/04, 04/01, 02/03, 03/02) ..... 4 (numbers)
When YY = 06, we have pairs (01/05, 05/01, 02/04, 04/02, 03/03) ..... 5(numbers)
When YY = 07, we have pairs (01/06, 06/01, 02/05, 05/02, 03/04, 04/03) ..... 6 (numbers)
When YY = 08, we have pairs (01/07, 07/01, 02/06, 06/02, 03/05, 05/03, 04/04)..... 7 numbers
When YY = 09, we have pairs (01/08, 08/01, 02/07, 07/02, 03/06, 06/03, 04/05, 05/04) 8 numbers
When YY = 10, we have pairs (01/09, 09/01, 02/08, 08/02, 03/07, 07/03, 04/06, 06/04, 05/05) .... 9 numbers
Adding all, 1 +2+3+4+5+6+7+8+9 = 45

Question No. : 59

Some people believe that January 1, 2000, is the first day of the 21st century. Other people feel that the honour belongs to January 1,2001. But everyone should agree that January 1,2002, is the first 'Sum-Day' of the new century. When you write out that date in (dd/mm/yy) notation it becomes 01/01/02, and 1 + 1 = 2. More generally, a 'Sum-Day' is a date in which the day and the month add up to the year, only last two digits of the year is taken into account.

The last 'Sum-Day' of the 21st century fell in the (Answer in option)

1. first decade of the 21st century
2. third decade of the 21st century
3. fourth decade of the 21st century
4. fifth decade of the 21st century

A) 4 B) C) D)

Explanation:-

Last Sum-Day in 21st century = 31/12/43
So it is fifth decade.
Hence, the correct answer is option D.

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

Question No. : 60

In order to promote sales, a shopkeeper is preparing a display of chocolates in blue and pink gift packs. Each gift pack will contain exactly three different chocolates from amongst 5 Star, Bournville, Crackle, Dairy Milk, Fruit n Nut, Gems and Silk. No chocolate can be packed in both gift packs. From past experience, the shopkeeper knows that:

The Bournville and the Dairy Milk must be on display in the blue and pink gift packs respectively.
The Gems can neither be displayed in the gift pack with the Dairy Milk nor in the gift pack with the 5 Star.
The Fruit n Nut and the Silk must be on display in the same gift pack.

Which of the following combinations of chocolates can be displayed in the blue gift pack?

✓A) Bournville, Crackle, Gems B) Bournville, Crackle, Fruit n Nut C) Bournville, 5 Star, Silk
D) Bournville, Dairy Milk, Gems

Explanation:-

We know that fruit n Nut and Silk must be in the same pack.
So options 2 and 3 are ruled out.
Dairy Milk must be in the pink pack.
So option 4 is ruled out.
The best answer is option 1.

Question No. : 61

Which of the following combinations of chocolates can be displayed in the pink gift pack?

A) Dairy Milk, 5 Star, Gems B) Dairy Milk, Fruit n Nut, 5 Star ✓C) Dairy Milk, 5 Star, Crackle D) Dairy milk, Gems, Silk

Explanation:-
We know that fruit n Nut and Silk must be in the same pack.
So options 2 and 4 are ruled out.
Since Gems cannot be displayed with Dairy Milk, option 1 is ruled out.
The best answer is option 3.

Question No. : 62

If Silk is displayed in the blue gift pack, which of the following pairs of chocolates must be displayed in the pink gift pack?

A) Fruit n Nut, 5 Star ✓B) 5 Star, Crackle C) Crackle, Gems D) Fruit n Nut, Gems

Explanation:-
If Silk is displayed in the blue pack, then fruit n Nut is also displayed in the blue pack.
Now, Gems cannot be displayed in the pink pack.
So, the pink pack contains Dairy Milk, crackle and 5 Star.
The best answer is option 2.

Question No. : 63

If Silk is displayed in the pink gift pack, which of the following pairs of chocolates could be displayed in the blue gift pack?

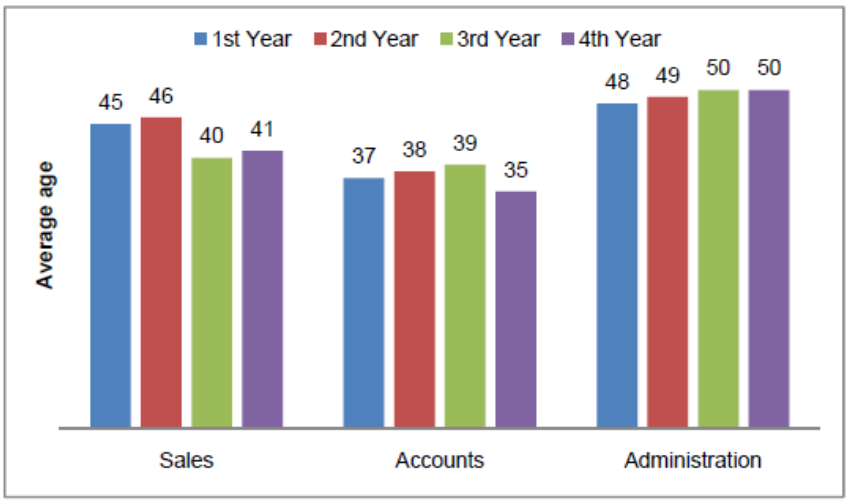
A) Fruit n Nut, 5 Star B) 5 Star, Gems C) Fruit n Nut, Crackle ✓D) Crackle, Gems

Explanation:-
If Silk is displayed in the pink pack, then fruit n Nut is also displayed in the pink pack.
The blue pack will now contain Bournville, Gems and it may have Crackle. The best answer is option 4.

DIRECTIONS for the question: *Analyse the graph/s given below and answer the question that follows.*

Question No. : 64

The following bar graph gives the average ages, as on 1st April of four consecutive years, of all the employees of each of the three departments - Sales, Accounts and Administration of company XYZ. Each department had at least 5 and at most 10 employees in the first year. In each department, exactly one employee, on attaining the age of 60, retired during the given period, while in exactly one of the three departments, a new employee aged 25 joined in either the second or the third or the fourth year.No employee, other than those mentioned above, left or joined any of the departments during the given period.



How many employees were there in the three departments put together, during the second year? (in numerical value)

A) 20 B) C) D)

Explanation:-
In administration, even though a person aged 60 retired at the end of the third year, the average age remains the same. This is possible only if the number of employees was ten initially. Assume there are x employees in the third year. 51x-60=50(x-1) x=10. Similarly in the accounts department, the average age of 39 years in the third year became 35 years in the next yearafter a person aged 60 retires. For this to happen the number of people initially should have been 5. In sales department, at the end of the third year the average age of should have become 47 i.e., 46 +1. But it is only 40 (i.e.. 7 less), it is due to the joining of new employee and retirement of the old employee.
Hence, 46x - 60 + 25 + 5 = 40x x = 5
So total employees = 5 + 5+ 10 = 20.

Question No. : 65

In which department did the new person join?

✓A) Sales B) Accounts C) Administration D) Cannot be determined

Explanation:-
The new person joined in the sales department. Choice (A)

Question No. : 66

How many people were there in the sales department in the fourth year? (in numerical value)

A) 5 B) C) D)

Explanation:-
Assume the minimum number of people (5) were there in the sales department. Their total age in the second year = 46 5 = 230. Their total age next year would be 47 x 5 = 235. Even if a person aged 60 retires, the total age of the remaining 4 people would be

$$\frac{235-60}{4}=\frac{175}{4}=43.75$$

Since average age of the persons cannot fall below 43.75 years in the third year and the given value is 40 years, the only possibility is that a person aged 25 years also must have joined the sales department in the third year. Only then we get, in case of five people initially,

Average age in third year $=\frac{235-60+25}{5}=40.$

Section : Quantitative Ability

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 67

Rohit purchased two apples, a mango and a banana and paid a total amount of Rs.20 for all the fruits together. If the prices (in Rs.) of the fruits were all positive integers, for how many combinations of prices of the fruits would this have been possible? (in numerical value)

A) 81 B) C) D)

Explanation:-

Let a, m, b be prices of apple, mango and banana respectively. Then the problem is equivalent to finding number of positive integral solutions of

2a + m + b = 20 .. (i)

For a = 9, the maximum value possible for a = 9; m + b = 2. So, the number of solutions = 1.

For a = 8; m + b = 4. So, the number of solutions = 3; and so on. Finally, for a = 1; m + b = 18. So, the number of solutions = 17

Total number of possible solutions is 1 + 3 + .. + 17 = $\frac{9(1+17)}{2}$.

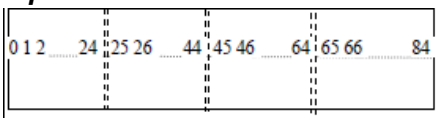
DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 68

The whole numbers from 0 to 84 (both inclusive) are written, from left to right, on a thin, long metal sheet, in the ascending order, all along its length, such that the gap between any two consecutive digits is the same. If the sheet is now cut into four equal pieces along its length, using three cuts, what is the sum of the two digits on either side of the rightmost cut? (in numerical value)

A) 10 B) C) D)

Explanation:-



From 0 to 84, total number of digits = 10 (1) + 75(2) = 160

Since, the sheet is cut into 4 equal parts, each part has $\frac{160}{4}$ *=40digits. The division would be as shown in the above figure. 4 and 6 are present on either side of 3rd cut.4 + 6 = 10.*

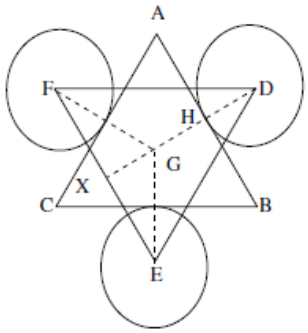
DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 69

ABC is an equilateral triangle of side 1 cm. Three circles, each of radius 1 cm, are drawn tangential to each of the sides AB, BC, AC at their midpoints, outside the triangle. Find the ratio of the area of the triangle formed by joining the centres of these circles to the area of the equilateral triangle.

A) 4 : 1 B) $2(\sqrt{3}+1):2$ ✓C) $13+4\sqrt{3}:4$ D) 2 : 1

Explanation:-



If D, E and F are centres of the circles. ΔDEF is also an equilateral triangle. G is the centroid of both ΔABC and ΔDEF.

$DG = \frac{2}{3}DX$

Since $DX = \left[\frac{\sqrt{3}}{2}\right]DE$

From above two equations, we get $DE = (\sqrt{3})DG$

$HG = 1/3^{rd}$ of the Altitude of $\Delta ABC = \frac{1}{3}\times\frac{\sqrt{3}}{2}\times 1 = \frac{1}{2\sqrt{3}}$

Now, $DG = DH + HG = 1 + \frac{1}{2\sqrt{3}}$

(DH = 1 = Radius of each circle)

Solving, we get $DE = (\sqrt{3})(1 + \frac{1}{2\sqrt{3}}) = \frac{2\sqrt{3}+1}{2}$

Hence, the ratio of the areas = $13 + 4\ (\sqrt{3})$: 4

DIRECTIONS for the question: *Mark the best option:*

Question No. : 70

Ram s watch is 10 minutes slow while Laxman s watch is 5 minutes ahead. Exactly at 2:20 pm by their respective watches they both start at the speed of 50 km/h. Ram travels from Chandigarh to Ludhiana and Laxman travels in the opposite direction. If the distance between Ludhiana and Chandigarh is 100 km, what will be the time in Laxman s watch when they cross each other?

A) 3 : 22.5 p. m. ✓B) 3 : 27.5 p. m. C) 3 : 12.5 p. m. D) 3 : 42.5 p. m.

Explanation:-

When Laxman leaves at 2:20, the correct time is 2:15. When Ram leaves at 2:20, the correct time is 2:30. In these15 minutes, Laxman has covered 12.5 km. Now, at 2:30 correct time, they are 87.5 km apart and their relative speed is 100 kmph. The time taken to meet will be 87.5/100 = 7/8 hrs, i.e., 52.5 min after 2:30. Thus they will meet at 3:22.5 correct time and Laxman s watch will show 3: 27.5 p. m.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 71

In a sequence $a_1, a_2, a_3, \ldots, a_{15}$ the following conditions are valid.

a_1, a_4, a_7 ... are all positive multiples of 3.

a_2, a_5, a_8 ... are all positive multiples of 4.

a_3, a_6, a_9 ... are all positive multiples of 5.

If $a_1 < a_2 < a_3 < a_4 \ldots < a_{15}$, find the smallest value of $\sum_{n=1}^{15} a_n$

A) 150 B) 272 ✓C) 239 D) None of these

Explanation:-
It is an iterative process. Start with the multiplies of 5, i.e. 5, 10, 20, 25, 30. Note 15 is not included since it would not satisfy the other conditions. Hence, the multiplies of 3 must be 3, 6, 12, 21, 27 and the multiplies of 4 are 4, 8, 16, 24, 28.
Now, the required sum comes out to be 239.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 72

If K is any natural number, such that 100 $\leq$ K $\leq$ 200, how many Ks exist such that K! has 'x' zeroes at the end and (K + 1)! has 'x + 2' zeroes in the end? (in numerical value)

A) 3 B) C) D)

Explanation:-
The values of K would be such that K + 1 would be divisible by 25 and not by any other higher power of 5. Hence, there are three possible values of K, i.e. K = 149, 174 and 199.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 73

Nikita wants to double her money by investing it in an appropriate scheme. She has four options to choose from. She can invest her money with Rita, who will give 12% p.a. but will hold the investment for a minimum of 6 years. She can invest her money with Ram, who will give 8% p.a. for a maximum of 5 years. She can invest her money with Meena, who will give 17% p.a. for a maximum of three years. She can invest her money with Anuradha, who will give 10% p.a., for a time period not exceeding 6 years. Assuming all the interest rates are compounded annually, who should Nikita invest her money with?

A) Ram ✓B) Rita C) Meena D) Anuradha

Explanation:-
There is catch in the question.
Nikita s objective is to double her money.
If she invests her money with Rita, she can invest it for a period will help her double the investment.
If she invests with any of the other three people, the sum of money cannot be doubled in the time periods specified.
Thus, Nikita should invest her money with Rita.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 74

I have an amount of Rs.10 Iakh, which I want to invest in stocks of some companies. I always invest only amounts that are multiples of Rs.1 lakh in the stocks of any company. If I can choose from among the stocks of five different companies, in how many ways can I invest the entire amount that I have? (in numerical value)

A) 1001 B) C) D)

Explanation:-
The situation is similar to placing 10 identical balls among 5 distinguishable boxes, where a box may have zero or more balls in it. This case can be represented as arranging ten balls and (5-1) four walls in a single row, which can be done in $^{14}C_4$ ways. (The balls placed between every successive pair of walls belong to one group). $^{14}C_4$ = 1001 ways.

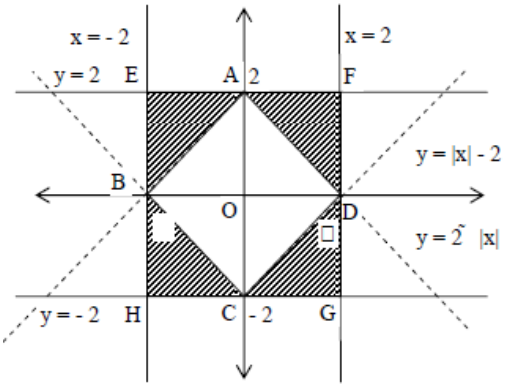
DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 75

Find the area (in sq.units) of the region bounded by the graphs of $x^2 = 4$ and $y^2 = 4$ but lying outside the region bounded by the graphs of $y = |x| - 2$ and $y = 2 - |x|$

A) 4 B) 16 ✓C) 8 D) None of these

Explanation:-



Required Area = Square EFGH − Square ABCD
$= 4^2 - \left(2\sqrt{2}\right)^2 = 8$ *sq. units.*
Choice (C)

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 76

How many unique sums greater than zero can be made using any number of notes from 100 notes each of Rs. 2 and Rs. 5 denomination?

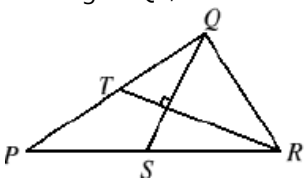
A) 700 B) 698 C) 697 ✓D) None of these

Explanation:-
The smallest sum that can be formed is Rs. 2. The largest is Rs. 700. We can create every sum from Rs. 2 to Rs. 700 except Rs. 3, Rs 699 and Rs 697.
Hence, there are 696 possibilities.
Therefore, the correct answer is option D.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 77

In traingle PQR, S and T are the mid-points of PR and PQ respectively; QS is perpendicular to RT; QS = 8; RT = 12.



What is the area of triangle PQR? (in numerical value)

A) 64 B) C) D)

Explanation:-

Let U be the point of intersection of QS and RT.

As QS and RT are medians of the triangle, they intersect at a point which divides each in the ratio 2 : 1, so QU = $^{2}/_{3}$ 8 = $^{16}/_{3}$.

Therefore the area of triangle QTR = $^{1}/_{2}$ 12 $^{16}/_{3}$ = 32.

As a median divides two triangles into equal area, the area of the traingle PTR is equal to the area of the traingle QTR, so the area of the traingle PQR is 64.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 78

There are two drums D_1 and D_2, each of which is filled to the brim with water. Now, a leak is made at the bottom of each of D_1, and D_2, such that the leak in D_1, takes 6 hours to empty it, while the leak in D_2 takes 9 hours to empty it. If the capacity of D_1 is more than the capacity of D_2 by 60%, then find the time after which the volume of water in D_2 will be 25% more than the volume of water in D_1.

A) $2\frac{17}{23}$ hours ✓B) $4\frac{1}{2}$ hours C) 3 hours D) $4\frac{2}{3}$ hours

Explanation:-

Initially the volume of water in D_1 is more than the volume of water in D_2 by 60%

Let the capacities of the drums D_1 and D_2 be V_1 and V_2 respectively

$\therefore\ V_1 = V_2 + \frac{60}{100}(V_2)$

Let V_2 be 5k, therefore V_1 = 8k

Rate at which water leaks from $V_1 = \frac{8k}{6}$ *and the rate at which water leaks from* $V_2 = \frac{5k}{9}$

Let the time after which the volume of water left in D_2 becomes 25% more than the volume of water left in D_1 be t.

In time t water leaking out of $D_1 = \frac{8k}{6}t$

Therefore, the water left in $D_1 = 8k - \frac{8k}{6}t$ *and the water left in* $D_2 = 5k - \frac{5k}{9}t$

Now, $\frac{5}{4}\left(8k - \frac{8k}{6}t\right) = \left(5k - \frac{5k}{9}t\right)$

$5 - \frac{5}{9}t = \frac{5}{4}\left(8 - \frac{8}{6}t\right)$; Or, $5 - \frac{5}{9}t = 10 - \frac{5}{3}t$

Or, $\frac{5}{3}t - \frac{5}{9}t = 5$; Or, $\frac{2}{9}t = 1$

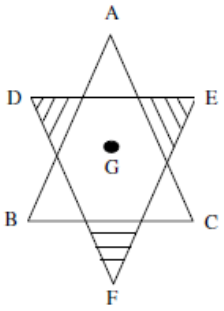
Or, t = 4.5 hours.

Choice (B)

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 79

ΔABC and ΔDEF are equilateral triangles and G is the centroid of both the triangles. DE || BC. What is the ratio of the sides of ΔABC and ΔDEF if the total shaded area is $\frac{A}{12}$, where A is the area of ΔABC?



A) 3 : 1 ✓B) 4 : 3 C) $\sqrt{5}:2$ D) $\sqrt{2}:5$

Explanation:-

Area of the three shaded triangles = $\frac{A}{12}$

Hence, area of one triangle = $\frac{A}{36}$

This is also an equilateral triangle.

Height of this triangle = $\frac{1}{6}$(Height of ΔABC)

Distance of the centroid of ΔDEF from the vertex

$E = \frac{1}{3}H + \frac{1}{6}H = \frac{1}{2}H$

Height of Δ DEF = $\frac{3}{2}\left(\frac{1}{2}H\right) = \frac{3}{4}H$

Since the ratio of heights of ΔABC and ΔDEF, both of which are equilateral triangles, is 4: 3.
Their sides would also be in the same ratio.
Hence, the correct answer is option B.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 80

A man bought a Scooter and a car. If he sold the scooter at 10% loss and the car at 20% gain, he would not lose anything; but if he sold the Scooter at 5% loss and the car at 5% gain, he would lose Rs. 10 in the bargain. The amount paid by him for the Scooter was :

A) 400 B) C) D)

Explanation:-

Let CP of scooter = Rs x and CP of car = y. We have $0.1x = 0.2y \Rightarrow \frac{x}{y} = \frac{2}{1} \Rightarrow x = 2y$. Now 5% of x – 5% of y = 10.

Put x = 2y we get 5% of 2y – 5% of y = 10 => 5% of y = 10 => y = Rs 200.
⇨ Hence x = Rs 400.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 81

Dipankar wanted to build a 15 ft. 25 ft. shed with a height of 10ft. Ganesh agreed to build the walls at a charge of Rs. 150 per day or part thereof. Raman agreed to build the floor and ceiling at a charge of Rs. 200 per day or part thereof. Bala agreed to paint the walls and the ceiling at a charge of Rs. 125 per day or part thereof. If Ganesh can build 36 sq. ft. per day, Raman can build 45 sq. ft. per day and Bala can paint 80 sq. ft. per day, what was the total wages paid by Dipankar?

A) Rs. 9350 ✓B) Rs. 8725 C) Rs. 8480 D) Rs. 8325

Explanation:-

The area of the walls is 2(15 10 + 25 10) = 800 sq. ft. Ganesh will build these walls in 800/36 = 22 $^{2}/_{9}$ days. So, Ganesh will be paid for 23 days, i.e., he is paid 23 150 = Rs. 3450. The area of the floor and the ceiling is 2(15 25) = 750 sq. ft. Raman will build these in 750/45 = 16 $^{2}/_{3}$ days. So, Raman will be paid for 17 days, i.e., he is paid 17 200 = Rs. 3400. The area to be painted is 800 + 375 = 1175 sq. ft. Bala will finish painting in 1175/80 = 14 $^{11}/_{16}$ days. So, Bala will be paid for 15 days, i.e., he will be paid 15 125 = Rs. 1875. Thus the total wages are 3450 + 3400 + 1875 = Rs. 8725.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 82

In a class there are students belonging to three different streams A, B and C. On the day the movie *Dil Chahta Hai* was released exactly 76% of A, 25% of B and 58% of C were absent. What is the minimum possible number of students who were present in the class? (in numerical value)

A) 30 B) C) D)

Explanation:-

Make sure that the numbers present are the smallest integers.
Minimum number of students of type A who were present = 6 (i.e. 24% of A)
Minimum number of students of type B who were present = 3(i.e. 75% of B)
Minimum number of students of type C who were present = 21(i.e. 42% of C)
Hence minimum number of students is 30.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 83

Find the sum of the first 20 terms of the series, 1, 6, 21, 52, 105,186. .. (in numerical value)

A) 41440 B) C) D)

Explanation:-

Given series is 1, 6, 21, 52, 105, .
Take the second term 6 = 2 3
Third term 21 = 3 7
Now, we take 2 in second term and 3 in third term as a definite factor (As a trial)
Now, 3 in the second term can be written in terms of 2 as (2 2 1) or (2^2 2 + 1)
We can observe from the series that the second form (i.e.) (2^2 2 + 1) satisfies the requirement.
$\therefore t_n = n(n^2-n+1)$ $t_n = n^3-n^2+n$

Their $S_n = \sum n^3 - \sum n^2 + \sum n$

$$S_n = \left[\frac{n(n+1)}{2}\right]^2 - \frac{n(n+1)(2n+1)}{6} + \frac{n(n+1)}{2}$$

$$S_{20} = \left[\frac{(20)(21)}{2}\right]^2 - \frac{20(21)(41)}{6} + \frac{20(21)}{2}$$

= 44100 2870 + 210 = 41440

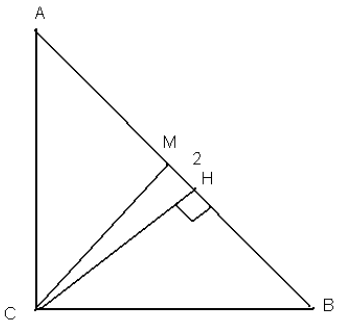
DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 84

In Δ ABC, ∠ACB = 90° and AC > BC. CM and CH are the median and the altitude emanating from C respectively. If AB = 12 and MH =2, what is the ratio of the areas of Δ ACM and Δ BCH?

A) 9 : 4 B) 3 : 5 C) 2 : 5 ✓D) 3 : 2

Explanation:-



Since CM is the median, AM will have length 6. So length of BM is also 6. So BH = 6 2 = 4. Since the altitudes of the two triangles are the same, the ratio of their areas is the ratio of the lengths of their bases. = 6 : 4 or 3 : 2.
Hence the answer is option D

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 85

The indices of the highest powers of 5 in N! and M! are 64 and 28 respectively. Find the maximum difference between the values of N and M. (in numerical value)

A) 144 B) C) D)

Explanation:-
The index of the highest power of 5 in N ! is 64.

$$\left[\frac{N}{5}\right]+\left[\frac{N}{5^2}\right]+\left[\frac{N}{5^3}\right]=64$$

[We do not consider $\left[\frac{N}{5^4}\right]$ *for the number N is definitely less than 625.]*

If $\frac{N}{5^3}=k$, *then N = 125 K*

$\frac{N}{5}+\frac{N}{5^2}+\frac{N}{5^3}$ *=25K+5K+K=31K*

For K = 2, we get N = 250. The highest power of 5 that divides 250! is $5^{62.}$
So, N! has 64 fives means the minimum value of N is 260 where as maximum value of N is 264.
Similarly for M = 125, the number of 5 s in 125 ! is 31.
We see that the number 125 = 5^3
So 124 ! will have 31 3 or 28 fives. The minimum value of M is 120.
So, the maximum difference between the values of M and N is 264-120 = 144.
Alternative solution:
To arrive N, such that the highest power of 5 In N!, is say k start with N as approximately four times k.
Hence, if the highest power of 5 in N! is 64, then check for N = 4 64 = 256.
Now, the highest power of 5 in 256! is 63, hence, we need to move the next multiple of 5 (i.e., 260) to get the highest power as 64.
And this highest power will remain as 64, for N = 260, 261, 262, 263 and also 264. Thus the maximum possible value of N = 264.
Similarly, we can see that the minimum possible value of M, such that highest power of 5 in M! is 28, is 120.
Thus the maximum difference between M and N is 264 -120 = 144.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 86

A container consists of 30 L of a mixture of A and B. The ratio of the volumes of A and B is 3 : 2. From this container 6 L of solution is removed and replaced with C. The same process is repeated once more.

What is the amount of C in the solution at the end of the second operation?

A) 4.8 L B) 3.6 L ✓C) 10.8 L D) None of these

Explanation:-

After adding 6 L of C the first time we are removing $\frac{1}{5}$ of it. We are left with 4.8 L. Then we add 6 L of C. Hence, the amount of C left at the end of the 2^{nd} operation is 10.8 L.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 87

An insurance company earns Rs. 250 per person as annual premium for MEDICLAIM insurance that covers hospitalization bill up to Rs. 18,900 at the rate of 80% of actual bills. It is estimated that only 1 out of every 100 insured persons would incur the hospitalization bill of Rs.15, 000. This scheme costs the insurance company 10% of the revenue as administrative cost.

In the situation given above, if instead of 1, 1.6 out of hundred incur hospitalization bills and the company wants to maintain its profit per person, how much should be the premium charged?

A) Rs. 325 B) Rs. 300 ✓C) Rs. 330 D) None of these

Explanation:-

Instead of 1, 1.6 people incur a hospitalization bill.
So cost of insurance firm = 12000 1.6 = 19200
Now let the total amount of annual premium be x
Therefore Total cost of the firm = 19200 + 0.1x
Since the firm wants to maintain same profit per person, therefore
x (19200 + 0.1x) = 10500
0.9x = 29700 x = 33000
Therefore premium to be charged per person if the firm wants to maintain the same level of profit
= 33000/100 = 330

Hence the answer is option C

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 88

What are the positive values of x that satisfy $\frac{x^2-4x-4}{x^2-7x+6} < \frac{2}{3}$?

A) $0 < x < 2$ ✓B) $0 < x < 1$ C) $x > 4$ D) $0 < x < 4$

Explanation:-

We can rewrite the expression as $\frac{x^2-4x-4}{x^2-7x+6} = \frac{x^2-4x-4}{(x-1)(x-6)}$.
We need to consider values of $x > 0$ so that the above expression is less than 2/3.
From the denominator, it is obvious that x cannot be equal to 1 or 6.
In the range $0 < x < 1$, the numerator will always be negative while the denominator will always be positive and the value of the expression will always be less than 2/3.
In the range $1 < x < 4$, the numerator and the denominator are both negative, but the absolute value of the numerator will be

greater than that of the denominator and the value of the expression will always be greater than 2/3.
In the range 4 < x < 5, the numerator and the denominator are both negative, but the absolute value of the numerator will be less than that of the denominator and the value of the expression will always be less than 2/3.
In the range 5 < x < 6, the numerator is always positive while the denominator is always negative so that the value of the expression is always negative and therefore is always less than 2/3.
In the range x > 6, the numerator and the denominator are positive and the numerator is greater than the denominator so that the value of the expression is always greater than 2/3.
Comparing this with the answer choices, the best answer is option 2.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 89

If $|a + 6| = 9$ and $|2b - 12| = 20$, then find the difference between the maximum and minimum possible values of a/b?

✓A) 75/16 B) 65/16 C) 85/16 D) 75/14

Explanation:-
a + 6 = 9, -9
a = 3, -15

Similarly, 2b − 12 = 20, -20
b = 16, -4

The different possible values of a/b are: 3/16, -15/16, -3/4, -15/-4

Maximum = 15/4
Minimum = -15/16

Difference = 15/4 + 15/16 = 75/16

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 90

If K! has exactly 6 different prime factors, find the value of K?

A) 6 B) 11 C) 13 ✓D) More than one value of K exists

Explanation:-
K! should be a multiple of the first six prime numbers i.e. 2, 3, 5, 7, 11 and 13. Thus values of K can be 13, 14, 15 and 16.
So, the correct answer is option D.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 91

There were three items being sold in a shop. Item A costs Rs. 10, item B costs Rs. 12 and item C costs Rs. 13. One day the shop has 120 customers. The shopkeeper noted that 70 items of A were sold, 40 of item B were sold, 80 of item C were sold. What was the maximum number of customers who did not buy anything if no customer bought more than two items of one type? (in numerical value)

A) 80 B) C) D)

Explanation:-
The minimum number of customers who could have bought the items would correspond to the case when each of the customers bought two items of one type. 40 people could have bought C. These 40 could include all the people who bought A as well as B. Hence, the minimum number of customers who could have actually bought something in the shop is 40.
Therefore, the maximum number of customers who did not buy anything if no customer bought more than two items of one type = 120 - 40 = 80

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 92

There are three tanks. Tank 1 and Tank 2 have outlets that fill into tank 2 and tank 3 respectively. The outlets from tank 1 leaks out water at the rate of 6 L/min into tank 2 and the leak from tank 2 leaks out water into tank 3 at the rate of 2 L/min respectively. The water is supplied into the tank 1 through an inlet pipe. Assume that as soon as the water enters the tank 1 it is leaked out into tank 2, tank 3 instantaneously.

What should be the minimum volume of tank 1 if all the tanks get filled up simultaneously in 2 min, if the inlet pipe to tank 1 fills at the rate of 10 L/min?

✓A) 8 L B) 12 L C) 16 L D) Data insufficient

Explanation:-
In 2 min the amount of water that would be leaked into tank 2 is 12 L out of which 4 L goes into tank 3. Hence, the volumes of tank 2, tank 3 are 8L, 4L respectively.
The volume of tank 1 = Amount supplied Amount leaked = 20 12 = 8 L

Question No. : 93

There are three tanks. Tank 1 and Tank 2 have outlets that fill into tank 2 and tank 3 respectively. The outlets from tank 1 leaks out water at the rate of 6 L/min into tank 2 and the leak from tank 2 leaks out water into tank 3 at the rate of 2 L/min respectively. The water is supplied into the tank 1 through an inlet pipe. Assume that as soon as the water enters the tank 1 it is leaked out into tank 2, tank 3 instantaneously.

What is the ratio of the volumes of the tanks so that if the water is supplied at 20 L/min, all the tanks get filled simultaneously after some time?

A) 10: 3: 1 B) 7 : 3 : 1 ✓C) 7 : 2 : 1 D) 2 : 2 : 1

Explanation:-
The ratio is same as the ratio of water it has left behind in each of the tanks after the leaks, i.e. 14: 4: 2 (or) 7: 2 : 1

DIRECTIONS for the question *: Solve the following question and mark the best possible option.*

Question No. : 94

The logarithm of $16\sqrt[3]{32}$ to the base of $\sqrt[3]{2}$ is

A) 17 B) C) D)

Explanation:-

Let x be the required logarithm.

$\therefore x = log_{\sqrt[3]{2}} 16\sqrt[3]{32}$

By replacing logarithm with the help of the definition, we get $\left(\sqrt[3]{2}\right)^x = 16\sqrt[3]{32}$

$\Rightarrow 2^{\frac{x}{3}} = 2^4 . 2^{\frac{5}{3}}$

$\Rightarrow 2^{\frac{x}{3}} = 2^{\frac{17}{3}}$

$\Rightarrow \frac{x}{3} = \frac{17}{3} \Rightarrow x = 17$

DIRECTIONS for the question *: Solve the following question and mark the best possible option.*

Question No. : 95

Find the number of zeroes immediately following the decimal point in $\left(\frac{2}{3}\right)^{432}$.

Given $\log_{10} 2 = 0.301$ and $\log_{10} 3 = 0.477$.

A) 76 B) C) D)

Explanation:-

In common logarithms of a number less than 1, if the mantissa is expressed as a positive figure, the characteristic is one more than the number of zeroes after the decimal point.
But if the mantissa is also taken as negative then the characteristic is EQUAL to the number of zeroes immediately after the decimal point.

$\therefore \log\left(\frac{2}{3}\right)^{432} = 432 \log\left[\frac{2}{3}\right]$

= 432 [log2 log3] = 432 [- 0.176] = -76.032
Here the negative sign will apply to both the integral part 76 and the decimal part 0.032.
The logarithm of $(2/3)^{432}$ has -76 as its characteristic when mantissa is negative.
Hence $(2/3)^{432}$ will have 76 zeroes immediately after the decimal point.
Hence, the correct answer is option B.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 96

TASTY SWEET HOUSE sells laddus in boxes of different sizes. The laddus are priced at Rs.5 per laddu upto 300 laddus. For every additional 10 laddus, the price of the whole lot goes down by 10 paise per laddu. What should be the number of laddus in the box that would maximize the revenue?

A) 360 B) 380 C) 420 ✓D) None of these

Explanation:-

Let the maximum revenue be realized when the number of laddus in a box is 300 + 10x. Hence as the number of laddus increases by 10x the price per laddu decreases by 10x paise i.e. the price per ladu becomes (500 – 10x) paise or $\left(5 - \frac{x}{10}\right)$ rupees.

New revenue realized = $(300 + 10x)\left(5 - \frac{x}{10}\right)$

$= 1500 + 20x - x^2 = -[x^2 - 20x + 100] + 1500 + 100$
$= 1600 - (x - 10)^2$

The revenue will be maximum when x = 10. Hence the maximum revenue is realized when the number of laadus per box is [300 + 10(10)] = 400

Hence, the correct answer is option D.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 97

If a, b, c are all non-negative numbers and $a^3 + b^3 + c^3 = 12$, then what is the maximum value of $a^2\ b^2\ c^2$? (in numerical value)

A) 16 B) C) D)

Explanation:-

$a^3 + b^3 + c^3 = 12$

For maximum value of $a^2b^2c^2$, the values of a, b and c should all be equal.

Thus, $a = b = c = 4^{\frac{1}{3}}$

Thus, $a^2b^2c^2 = 4^{\frac{2}{3}} \times 4^{\frac{2}{3}} \times 4^{\frac{2}{3}} = 4^{\frac{6}{3}} = 4^2 = 16$

Alternate Sol.:

We know that AM ≥ GM. So

$$\frac{a^3 + b^3 + c^3}{3} \geq \sqrt[3]{a^3b^3c^3} \Rightarrow 4 \geq abc \Rightarrow 16 \geq a^2b^2c^2 \text{ or } a^2b^2c^2 \leq 16.$$

So, the maximum value of $a^2\ b^2\ c^2$ will be 16.

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 98

If [*x*] is defined as the greater integer less than or equal to *x*, what is the value of [1] + [2] + [3] + [4] + + [399]?

A) 5031 ✓B) 5130 C) 3150 D) 5013

Explanation:-

Greater integer means the maximum integer value of function

$\sqrt{1}$ .... $\sqrt{3} = 1 + 1 + 1 = 1 \times 3 = n(2n + 1)$

$\sqrt{4}$ .... $\sqrt{8} = 2 + 2 + 2 + 2 + 2 = 2 \times 5 = n(2n + 1)$

$\sqrt{9}$ .... $\sqrt{15} = 3 \times 7$

.. *So on Till 19 39*

Sum of n(2n + 1) till 19 terms

= Sum of $2n^2 + n = 2n^2 + n = 2n(n + 1)(2n + 1) / 6 + n(n + 1) / 2$

= 2 19 20 39 / 6 + 19 20 /2 =

= 4940 + 190 = 5130

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 99

Three balloons one red, one blue and one yellow escaped into the air. The combined height of the red and the yellow balloons was 100 m. The combined height of the blue and the yellow balloons was 80 m. The combined height of the red and the blue balloons was 60 m. What is the height of the red balloon? (in m)

A) 40 B) C) D)

Explanation:-

Let height of red balloon = R

Height of blue balloon = B

and height of yellow balloon = Y

R + Y = 100 ..... (i)

B + Y = 80 ..... (ii)

R + B = 60 ..... (iii)

By (i) + (ii) + (iii) = 2 (R + B + Y) = 240
Thus, R + B + Y = 120 ..... (iv)
By (iv) (ii), we get R = 40

DIRECTIONS for the question: *Solve the following question and mark the best possible option.*

Question No. : 100

Here we have six rows of three numbers each.

1, 24, x	2, 23, y	3, 22, z
4, 21, a	5, 20, b	6, 19, c

Here x, y, z, a, b, c are all natural numbers so that the sum of any two numbers on any row is a perfect square.
What is the value of (a + b + c + x + y + z)? (in numerical value)

A) 430 B) C) D)

Explanation:-
We have six rows of 3 numbers each.
1, 24, x ; 2, 23, y ; 3, 22, z ; 4, 21, a ; 5, 20, b ; 6, 19, c.
The square number series = 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256.
Considering first row, (1 + x) is a square number and
(24 + x) is also square number.
The difference = 23
So (24 + x) = 144. ∴ (1 + x) = 121. ∴ x = 120.....(i)
Considering second row, (2 + y) is a square number and (23 + y) is a square number. The difference = 21. Thus, (2 + y) = 100 and (23 + y) = 121. ∴ y = 98.....(ii)
Considering third row, difference of (3 + z) and (22 + z) is 19. Thus, (3 + z) = 81 and (22 + z) = 100. Thus, (3 + z) = 81 and (22 + z) = 100. ∴z = 78.....(iii)
Considering 4th row, difference of (4+ a) & (21+ a) = 17. Thus, a = 60.....(iv)
Considering 5th row, difference of (20 + b) & (5+ b) = 15.
So, (5+ b) = 49; (20+ b) = 64; So, b = 44.....(v)
Considering 6th row, difference of (6+ c) & (19 + c) = 13.
(6+ c) = 36; (19+ c) = 49; So, c = 30.....(iv)
Thus, x+ y + z + a + b + c= 120+98+78+60+44+30 = 430.