Directions of Test

Test Name	2016 Bull CAT 16	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: *Identify the most appropriate summary for the paragraph and write the key for most appropriate option.*

Question No. : 1

There is only one cure for the evils which newly acquired freedom produces; and that cure is freedom. When a prisoner first leaves his cell he cannot bear the light of day: he is unable to discriminate colors, or recognize faces. But the remedy is not to remand him into his dungeon, but to accustom him to the rays of the sun. The blaze of truth and liberty may at first dazzle and bewilder nations which have become half blind in the house of bondage. But let them gaze on, and they will soon be able to bear it. In a few years men learn to reason. The extreme violence of opinions subsides. Hostile theories correct each other. The scattered elements of truth cease to contend, and begin to coalesce. And at length a system of justice and order is educed out of the chaos.

Which of the following is the best summary for the paragraph given above?

1. Though liberty in its inception produces anarchy and befuddlement, the situation clears and soon things move to orderliness.
2. Liberty when given to those who cannot handle it leads to a complete disruption of life and society.
3. Neo-free people are unable to handle freedom and need to be taught how to handle such a situation.
4. Newly acquired freedom is like a pandora box, and if those who are free are unable to seize the situation, chaos and mayhem is guaranteed.

A) 1   B)   C)   D)

DIRECTION for the question: *Answer the question based on the information given in the passage and write the key for the most appropriate option.*

Question No. : 2

You can only sacrifice that which you would like to keep for yourself; in other words, that which gives you pleasure and joy. You cannot sacrifice something that you dislike or disown. Sacrifice is always related to a higher cause for a greater good. At the same time, when your love for the greater good is so strong, nothing else assumes any value. Sacrifice here becomes irrelevant, because love alone is your strongest driving force. So when there is so much love there cannot be sacrifice. At the same time when there is no love, there is no sacrifice.

You do not sacrifice something for someone you are in love with. Sacrifice indicates that your pleasure has more value than the cause for which you are sacrificing. When the love is lukewarm, then sacrifice assumes meaning. Yet sacrifice purifies the human mind and reins in selfish tendencies. It can also bring pride, arrogance, self-pity and sometimes even depression.

You can sacrifice only that which you value. For a wise man nothing is more valuable than truth, values and the Divine, and he will never sacrifice those. God is the greatest, and if he values the greatest then how can he sacrifice God?

What can you infer from the paragraph above?

1. An act can be called sacrifice only if the doer is giving what he or she truly loves.
2. One sacrifices only when one wants material gain as the outcome.
3. Sacrifice has meaning only if it is done in a situation where the pleasure may be vicarious.
4. There is something paradoxical about sacrifice – that which you love the most may not be possible to sacrifice.

A) 4   B)   C)   D)

DIRECTION for the question: *Answer the question based on the information given in the passage and write the key for the most appropriate option.*

Question No. : 3

New advances in science have uncovered a fascinating twist in the writing of the Declaration of Independence, one that's still of interest to the Kettering Foundation today. Spectral imaging technology shows that in writing the Declaration of Independence, Thomas Jefferson had first referred to the American colonists as "subjects." But, in the course of revising the document, he then carefully expunged the word, smearing the ink and overwriting it with the word "citizens," so as to completely obliterate the original word. The sentence in which Jefferson made the change didn't make it into the final document, but the word "citizens" is also used elsewhere in the final Declaration, while "subjects" is not.

What can we infer from the above paragraph?

1. There was a shift in the Founder's thinking – people's allegiance was to one another and not to a distant king.
2. The stress was more on rule by a sovereign than rule by government.
3. Democracy needed to be stressed and this was achieved by denigrating the Colonial rule – hence the word *subjects* was replaced by the word *citizens*.
4. Americans, though seeking independence, had yet to move out of the subservient ideology, so distinct of sovereign subjects.

A) 1   B)   C)   D)

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

Question No. : 4

Dürr's great regret, and one of the main reasons why he travels around the world giving lectures, is the fact that despite the successful scientific history and profound technological impact of quantum physics, the ground-breaking view of the world that quantum physics entails has not been widely acknowledged. As Dürr constantly recalls, after over 80 years since quantum physics started, the majority of today's scientists still think in terms of 19th century knowledge. This has consequences even for the understanding of the layman, whose mentality and way of living in today's modern world is significantly influenced by the discoveries and the general attitude of science.

To explain the resistance of many of his colleagues - meaning not only physicists, but also scientists in general – Dürr quotes the example of the famous astrophysicist Sir Arthur Eddington in his The Philosophy of Physical Science.

Let us suppose that an ichthyologist is exploring the life of the ocean. He casts a net into the water and brings up a fishy assortment. Surveying his catch, he proceeds in the usual manner of a scientist to systematise what it reveals. He arrives at two generalisations:

(1) No sea-creature is less than two inches long.
(2) All sea-creatures have gills.

These are both true of his catch, and he assumes tentatively that they will remain true however often he repeats it. In applying this analogy, the catch stands for the body of knowledge, which constitutes physical science, and the net for the sensory and intellectual equipment, which we use in obtaining it. The casting of the net corresponds to observation; for knowledge, which has not been or could not be obtained by observation is not admitted into physical science. An onlooker may object that the first generalisation is wrong. "There are plenty of sea-creatures under two inches long, only your net is not adapted to catch them." The ichthyologist dismisses this objection contemptuously. "Anything uncatchable by my net is ipso facto outside the scope of ichthyological knowledge, and is not part of the kingdom of fishes which has been defined as the theme of ichthyological knowledge. In short, what my net can't catch isn't fish." Or—to translate the analogy—"If you are not simply guessing, you are claiming a knowledge of the physical universe discovered in some other way than by the methods of physical science, and admittedly unverifiable by such methods. You are a metaphysician. Bah!"

This habit of restricting science to what falls under our capability of interpreting, measuring and understanding, appears to be the product of a wrong way of thinking. According to Dürr, its mistake lies first of all in the assumption of the existence of an objective world, the world of matter, that quantum physics has demonstrated there is not as such.

Werner Heisenberg, Niels Bohr, Max Born and Wolfgang Pauli finally resolved the paradox of this "quantum physics" in 1925 with a radical re-interpretation of the dynamics. It demanded a revolution in what had been the classical view of the world, with the surprising recognition that matter is not really material at all, but a web of relationships, a kind of gestalt, or in a certain way "information" without any carrier. The assumed fundamental ontic structure of the world, based on a primally existing substance, was rendered invalid. It must be replaced by a "cosmos" where the first questions to ask are no longer "What is? and "What exists?", but "What happens?" and "What binds?" More precisely: Instead of the world assumed until then, a mechanistic, thing-filled, temporally determined "reality", the actual Wirklichkeit turned out to be "potentiality": an indivisible, immaterial, temporally essentially undetermined network of relationships that determines only probabilities, differentiated capacity for a material-energetic realization. The classical "reality" of material/object-like separated things emerges only through a coarsening averaging of the potential, thus turns into a holistic, temporally essentially open, immaterial, inseparable omni-connectedness.

Excerpted from 'Hans-Peter Dürr's thought as a source for peace work' by Francesco Pistolato

The latin phrase, ipso facto, as used in the phrase, "Anything uncatchable by my net is ipso facto outside the scope of ichthyological knowledge.." can best be replaced by –

A) by fact   B) by theory   C) by observation   D) as an inevitable result

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Question No. : 5

Which of the following words, used in the passage, is/are antonyms for metaphysical?

A. ontic
B. classical
C. Wirklichkeit
D. Gestalt

A) A & C   B) B & C   C) B & D   D) C & D

Question No. : 6

Which of the following phrases, used in the passage, would fall exclusively under the ambit of 19th century science?

A) ... emerges only through a coarsening averaging of the potential, thus turns into a holistic, temporally essentially open, immaterial, inseparable omni-connectedness.
B) . .... assumes tentatively that they will remain true however often he repeats it.
C) This habit of restricting science to what falls under our capability of interpreting, measuring and understanding..
D) .... with the surprising recognition that matter is not really material at all.

Question No. : 7

What is the primary message that the passage is conveying?

A) Knowledge, which has not been obtained by observation should not be admitted into physical science.
B) Newtonian knowledge is obsolete in an Einsteinian context.
C) Matter is not really material at all, but a web of relationships.
D) The ground-breaking view of the world that physics entails has not been widely acknowledged.

Question No. : 8

What would be a layman's interpretation of a coarsening averaging of the potential?

A) While we perceive electron as matter, it may actually be an approximation of energy.
B) Matter exists in two states – mass and energy.
C) The entire universe is a web – with everything connected to everything else.   D) The act of measuring changes what is measured.

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

Question No. : 9

Nobody really likes large-scale organisation: nobody likes to take orders from a superior who takes orders from a superior who takes orders.... Even if the rules devised by bureaucracy are outstandingly humane, nobody likes to be ruled by rules, that is to say, by people whose answer to every complaint is: 'I did not make the rules: I am merely applying them.' Yet, it seems, large-scale organisation is here to stay. Therefore it is all the more necessary to think about it and to theorise about it. The stronger the current, the greater the need for skilful navigation.

The fundamental task is to achieve smallness within large organisation. Once a large organisation has come into being, it normally goes through alternating phases of centralising and decentralising, like swings of a pendulum. Whenever one encounters such opposites, each of them with persuasive arguments in its favour, it is worth looking into the depth of the problem for something more than compromise, more than a half-and-half solution. Maybe what we really need is not either-or but the-one-and-the-other- at-the- same-time.

This very familiar problem pervades the whole of real life, although it is highly unpopular with people who spend most of their time on laboratory problems from which all extraneous factors have been carefully eliminated. For whatever we do in real life, we must try to do justice to a situation which includes all so-called extraneous factors. For we always have to face the simultaneous requirement for order and freedom.

In any organisation, large or small, there must be a certain clarity and orderliness; if things fall into disorder, nothing can be accomplished. Yet orderliness as such, is static and lifeless; so there must also be plenty of elbow-room and scope for breaking through the established order to do the thing never done before, never anticipated by the guardians of orderliness, the new, unpredicted and unpredictable outcome of a man's creative idea. Therefore any organisation has to strive continuously for the orderliness of order and the disorderliness of creative freedom. And the specific danger inherent in large scale organisation is that its natural bias and tendency favour order, at the expense of creative freedom.

We can associate many further pairs of opposites with this basic pair of order and freedom. Centralisation is mainly an idea of order; decentralisation, one of freedom. The man of order is typically the accountant and, generally, the administrator: while the man of creative freedom is the entrepreneur. Order requires intelligence and is conducive to efficiency; while freedom calls for. and opens the door to, intuition and leads to innovation.

Excerpted from pages 726-734 of 'Small is Beautiful' by EF Schumacher

Order has been associated with all of the following, except?

A) Centralisation   B) Bean counters   C) Entrepreneurs   D) Efficiency

Question No. : 10

The central idea of the passage is expressed in which of the following sentences?

A) Nobody likes to be ruled by rules.   B) Large scale organisation has its natural bias and tendency favour order.
C) For we always have to face the simultaneous requirement for order and freedom.
D) The stronger the current, the greater the need for skilful navigation.

Question No. : 11

The fundamental task is to achieve smallness within large organisation.
This sentence from the passage represents what figure of speech?

A) Paradox   B) Hyperbole   C) Irony   D) Metaphor

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

Question No. : 12

The central argument of Siddharth Kara's, *Sex Trafficking: Inside the Modern World of Sex Slavery* is that "the enormity and pervasiveness of sex trafficking is a direct result of the immense profits to be derived from selling inexpensive sex around the world. The structures of Western capitalism, as spread through the process of economic globalisation, contribute greatly to the destruction of lives this profitability entails. Sex trafficking is one of the ugliest contemporary actualisations of global capitalism

because it was directly produced by the harmful inequalities spread by the process of economic globalisation: deepening of rural poverty, increased economic disenfranchisement of the poor, the net extraction of wealth and resources from poor economies into richer ones, and the broad-based erosion of real human freedoms across the developing world. Ending sex trafficking requires an attack on the industry's immense profitability and a radical shift in the conduct of economic globalisation."

In other words, simply checking trafficking will not help as long as centres of exploitation exist. Acquisition of sex slaves primarily occurs in one of these five ways: deceit (false job promises), sale by family, abduction (least popular as it complicates trafficking), seduction or romance (marriage), or recruitment by former slaves (rarer), Kara says. In India, Dalits, tribal people and other marginalised communities are extremely vulnerable to trafficking and constitute a large proportion of the bonded labour force.

Meena Seshu, founder of an HIV/AIDS prevention, treatment and support organisation, insists that women who are living the life, facing the violence and struggling through it all have to be a part of whatever process the government initiates. "I've worked for 22 years with sex workers and I can't presume to write guidelines for them," she says. She cautions against an emotional reaction to the issue. She points out that of all the marginalised people, women in prostitution are treated as specimens and only seen as victims and trafficked sex slaves. By not treating them as sex workers, their agency is being denied to them and consequently their rights, she argues.

According to her, there is no agreement on the use of the term "exploitation" internationally, too, as often abolitionists who have moral problems with sex work use the term "sexual exploitation". Importantly, some of the anti-trafficking strategies affect the sex workers' rights movement. A better strategy, says Meena, is to demand compensation for these women to improve their lives. "Some of the women actually ask: where were you when I was actually being trafficked? What we want is a safe mobility policy for women, those who want to move can move without the fear of being sucked back into the trade, which is often the case. Women have the ability to consent to their movement. If you want to help them, root out exploitation and violence. Ask them what solutions they want rather than have these drawing room discussions about them," she says.

Meena believes there is scope for decriminalisation and destigmatisation of the profession and says that safe working conditions should be created so that nobody can buy or sell them and nobody can do the things that happen to them. "Today the money they make is taken away from them by violent gangs. They can't even go to the police because the police tell them they can't be raped. They are absolutely outside the margins. Construction workers and ragpickers also perform highly risky and dehumanising labour. But no one has a moral issue with that. But with sex, you have a problem," she says.

Excerpted from an article in Frontline dated Nov 2015, 'National Legal Services Authority recommends various steps to curb human trafficking for sexual exploitation and to rehabilitate victims of the crime' by Divya Trivedi

The difference between Siddharth Kara and Meena Seshu's viewpoint on the sex trade is primarily, in that –

A) Siddharth focuses on voluntary sex workers and Meena on the involuntary ones.
B) Meena focuses on voluntary sex workers and Siddharth on the involuntary ones.
C) Siddharth believes that the police have an important role to play in rehabilitation of sex workers, Meena believes that it is NGOs who can do a better job in such cases.
D) Meena believes that the police have an important role to play in rehabilitation of sex workers, Siddharth believes that it is NGOs who can do a better job in such cases.

Question No. : 13

As used in the third paragraph last sentence, the word '*agency*' most closely stands for?

A) An organization providing a particular service on behalf of another person.   B) Intervention producing a particular effect.
C) The ability of a person to act for herself.   D) The state of exerting power.

Question No. : 14

Which of the following can be a practical solution to the problem of 'sex exploitation' in India?

A) Alleviation of rural poverty.   B) Setting up of special police stations to work on cases related to deceit and seduction.
C) Reduce the sex industry's profitability by imposing high tax rates.   D) A safe mobility policy

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Question No. : 15

You would include all of the aspects below in a definition of sexual exploitation, except

A) Sexual abuse   B) Personal Monetary gains   C) Portrayal though media   D) Coerced brokering relationships

Question No. : 16

According to the passage, for bettering the lives of sex workers, focus of the government efforts should be on –

A) Empowerment and reintegration   B) Correction and detention   C) Construction workers and rag pickers
D) Alternative sources of employment

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

Question No. : 17

There are two ways of thinking about simplicity. One, we recognize what simplicity is when we see it. Or we can think about simplicity in terms of what is called the teapot problem. You see a teapot filled with hot water. And you ask: Why is the water hot? One answer would be: because the kinetic energy of the water molecules is high and they bounce against things rapidly -- that's a kind of physical science argument. A second argument would be: because it was sitting on a stove with the flame on -- that's an historical argument. A third is that I wanted hot water for tea -- that's an intentional argument. And, the fourth would be that it's part of God's plan for the universe. The point is that you get into trouble when you ask a single question with a single box for an answer, in which that single question actually is many questions with quite different meanings, but with the same words.
 To understand simplicity, we can use an example - of the Internet, because it's a particularly good example of stacked simplicity. We call it a complex system, but it's also something else. The Internet starts with mathematics, it starts with binary. We are familiar with the Arabic numbers one to 10 and so on. In binary, one is 0001, seven is 0111. The virtue of binary is that it's the simplest possible way of representing numbers. Now, if you like to represent this zero and one of binary, you need a device. And think of things in your life that are binary, one of them is light switches. They can be on and off. That's binary. Now wall switches, we all know, fail. A transistor is nothing more than a wall switch. It turns things on and off, but it does so without moving parts and it doesn't fail, basically, for a very long period of time. So the second layer of simplicity was the transistor in the Internet. So, since the transistor is so simple, you can put lots of them together. And you put lots of them together and you come with something called integrated circuits – and stacking millions of those, you get the internet.
 So what are the characteristics of simple things? First, they are predictable. Their behavior is predictable. The second is they're cheap. If you have things that are cheap enough, people will find uses for them, even if they seem very primitive. And they should serve as building blocks. That is, you can stack them. But if you have something that has a function, and it's really cheap, people will find new ways of putting it together to make new things. Cheap, functional, reliable things unleash the creativity of people who then build stuff that you could not imagine. Let me close with an aphorism by de Saint-Exupery. "You know you've achieved perfection in design, not when you have nothing more to add, but when you have nothing more to take away."

Excerpted from TED talk by George Whitesides

Which of the following quotes best define the concept of simplicity?

A) 'The most technologically efficient machine that man has ever invented is the book.' –Northrop Frye
B) 'Science without religion is lame, religion without science is blind.' – Albert Einstein
C) Potter Stewart on pornography: 'Perhaps I could never succeed in intelligibly defining it. But I know it when I see it.'
D) "It is not a lack of love, but a lack of friendship that makes unhappy marriages.' – Friedrich Nietzsche

Question No. : 18

On the basis of a reading of the passage, which of the following would serve as a suitable example for complexity?

A) Cellphones   B) Search engines   C) Traffic   D) Cathedrals

Question No. : 19

A little paper chip has a few things printed on it. You put a drop of urine at the bottom. It wicks its way up. It turns colors. You're reading kidney function. The health care worker takes a picture of it with his cellphone and sends the picture back to where there is a doctor.

The above example meets all the criteria of simplicity, except

A) Predictable   B) Cheap   C) Stackable   D) Reliable

Question No. : 20

We academics love complexity. You can write papers about complexity, and the nice thing about complexity is it's fundamentally _____ in many ways, so you're not responsible for outcomes. What you are interested in has a lot to do with the rewards of

the system. And there's a lot of rewards in thinking about complexity and emergence, not so much in thinking about simplicity.

A) unpredictable   B) intractable   C) convoluted   D) radical

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Question No. : 21

A. The rapid developments during the two world wars and the Cold War provided significant advances in the capabilities of acoustic detection devices.
B. Bioacoustics is no longer a secondary research field rather an area of research in which equipment designed specifically for acoustics research is being produced for the study of marine life.
C. Bioacoustics, by the end of the twentieth century, had become a mature independent discipline, thus setting the stage for significant new advances in this area of research in the twenty-first century.
D. The developments of the twentieth century laid the foundations for a growing and productive research field which, in the first decades of the twenty-first century, is truly coming into its own.
E. By the last quarter of the twentieth century, acoustic technology had become a significant tool in the study of marine life comparable in significance to molecular biology techniques and other leading-edge research technologies.

A) 15243   B)   C)   D)

Question No. : 22

A. It's silly to think that its students generally emerge with brand new character traits.
B. If personality determines handwriting, there is no way to account for the fact that a normal distribution of personalities in early 20th-century American children all ended up with relatively similar handwriting through the Palmer Method.
C. Conversely, more recently there have been courses offered in handwriting improvement.
D. Indeed, it all points towards graphology being a rather misguided-if earnest-attempt at nailing down the mystery of personality and the mind.
E. And, finally, what to say about calligraphers, or others who specialize in many forms of lettering?

A) 23154   B)   C)   D)

Question No. : 23

A. Numerous studies in recent decades have found the 19th century social world they portray so unremittingly sexist that some leading folklorists warn against reading them to children at all.
B. What modern mother hasn't cringed at the pink and passive fairy tale princesses served up to her impressionable girl?
C. The answer is that they are rooted in a tenacious and remarkably unaltered cultural tradition, the fairy tales first published two centuries ago by the Brothers Grimm.
D. The fifty iconic tales in their Kinder- und Hausmärchen collection feature a parade of weak, disobedient heroines whose errors draw down harsh punishment, and an equally note worthy succession of heroic boys
E. The Disney versions of Snow White and Cinderella, Belle and Rapunzel are heroines of such vapid foolishness one wonders how they survived into the 21st century.

A) 25341   B)   C)   D)

Question No. : 24

A.When you submit your manuscript it will most likely join a heap waiting for someone to sort and sifting before it topples over – the so-called slush pile.
B. The someone is either the editorial department junior or an old hand who comes in a couple of mornings a week and is paid by the hour.
C. Neither of these have much influence, but they are basically on your side and out to discover something original –
D. the junior to make his or her name and acquire an author of his or her own if he or she is lucky, the old hand to justify continuing freelance employment.
E. If they think your novel is promising, they will pass it to a more senior editor and eventually it will surface at an acquisition meeting.

A) C and D   B) A, B, and E   C) B and D only   D) A and B only

DIRECTIONS for the question: *The question consists of four/five sentences on a topic. Select the option that indicates grammatically **incorrect or inappropriate** sentence/s.*

Question No. : 25

A. A family emergency took us over the country for several weeks during the spring of that year.
B. We had left our first vegetable garden in the midst of early growing season, a time when carefully monitoring of emerging seeds is essential to ensure their vitality.
C. Only a serious family matter would have instigation for such a departure.
D. We arrived home three weeks later to witness an incredible transformation.
E. Not only had the broccoli stalks and scarlet radishes come to bear fruit, but also the local deer population had decided to make a meal of our freshly sprouted crop.

A) C, D and E only   B) A and C only   C) D and E only   D) A and B only

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. If regulatory limits on building heights and density were relaxed, fewer plots of land would be needed to satisfy a given level of demand.
2. A lord sitting on highly productive agricultural land suddenly found his profits swelling: not as a result of innovation on his part but because humanity needed more of something he happened to own.
3. That would reduce the rents collected by landowners, since any uptick in demand could quickly be met by new development.
4. Just as soaring agricultural productivity led to a decline in the relative economic power of rural landowners in the 19th and 20th centuries, the relaxation of strict limits on development would lead to a decline in property wealth relative to the economy as a whole.

A) 2   B)   C)   D)

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. : 27

1. The look and feel of a book is as much a part of its appeal as its contents.
2. Books as cultural icons remind us of freedom of speech and enhanced opportunities, they remind us of the intellectual aspirations of the human race.
3. There is something immensely satisfying about opening a new book: the smell of the paper, the feel of the cover, the design on the dust jacket and the weight of the volume all contribute to the impression it makes.
4. In a sense, books have always been more than just repositories of information.

A) 2   B)   C)   D)

Question No. : 28

My dad never used the black belt. He whipped us only once. My brothers and I stole a candy bar from the grocery store. I was five, and John and Robert were three. We were in the back of the car when my parents asked us where we got the candy bar. We lied at first, and then admitted what we had done. Dad marched us back into the store and made us apologize to the manager. Then he took us home and spanked each of us by hand. It really did hurt him more than it hurt us, because I remember the look in his eyes of both shame and horror. He told us that he wasn't going to raise thieves and liars, and he seemed to think that he had somehow failed as a parent.

My father's willingness to leave the corporal punishment to the women was based, I believe, on his respecting his physical strength. An ex-Marine and engineer turned children's-book writer, my dad always fretted about being too harsh. He worried that he would get lost in the moment, lose control. (That's the difference between being an alpha male and being a good father: the ability to understand your limitations.) However, this doesn't mean that my father refrained from administering all forms of punishment. My brothers and I joke that Dad was the supreme master of looking disappointed and ashamed. Scenario: We'd screw up (by, let's say, participating in an attempted coup of the seventh grade). My mom would say, "Wait till your father gets home." Dad would arrive, already informed of the misdeed. He would take a deep breath. Then, in a tone that combined Darth Vader and Fred MacMurray, he would tell us that we'd disappointed him severely, that his trust was misplaced, and that it would be a long time before the bond between father and sons would be healed. Then he would look hurt. And, for some really bizarre reason, we'd wish that he'd get the black belt.

My parents understood the difference between a whipping and a beating – and the lasting psychological effects the latter could cause. A whipping from Mom was tough, but ultimately we realized it was fair. We had received – and understood – the message that we could not set the agenda and "run over" our parents, that they were the ones in charge. The animosity we felt before, during, and immediately after being punished would subside within an hour or two and we'd come to realize that they were right. A beating is different. We were never beaten. I knew kids who were brutally beaten, and even though we were just children, my brothers and I were able to realize the distinction. For those unlucky kids, the animosity never subsided. This is not to say that they all grew up to be hardened criminals . . . only a few of them. Some have gone on to be cold to their parents and cold to the world. A few appear to be fine. But appearances can be deceiving.

Excerpted from Page 73-74 of 'Not Guilty' by Jabari Asim

What was the attitude of the author's parents to corporal punishment?

A) Spare the rod and spoil the child.   B) More carrot, less stick.   C) All carrot, no stick.   D) Mom's the carrot, Dad's the stick

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Question No. : 29

What can be inferred about Fred MacMurray?

A) He was a character in Star Wars.   B) He was an actor in Hollywood movies, known for his 'nice guy' roles.
C) He was a famous author of children's books.   D) A voice artiste, popular on US radio stations.

Question No. : 30

What is the difference between a whipping and a beating?

A) It is just semantics – the context changes, the act remains the same.
B) When the father slaps, it is a beating. If the mother slaps, it is a whipping.
C) When the act justifies the punishment, it is whipping, otherwise it is beating.
D) Where the animosity continues, it is whipping. If it does not, it is beating.

Question No. : 31

What is the purpose of the last sentence of the passage?

A) To open up a possibility of contrariness.   B) To reinforce a counter-point.
C) To imply that there are no exceptions to the point made.   D) To invalidate the argument by using an example.

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

Question No. : 32

There is a close relationship between size and life span. Though there are exceptions, larger species tend to live longer than smaller ones, and by some reckonings, the largest dinosaurs had very long life spans – so much time and space for mutations to collect. Wouldn't that have made them highly susceptible to neoplasms? At least in the mammalian world the issue is not clear-cut, an observation that goes by the name of Peto's paradox. It was named for Sir Richard Peto, an Oxford epidemiologist. He was puzzled that large long-lived creatures like elephants don't get more cancer than small short lived creatures like mice. The mystery was succinctly posed in the title of a paper by a group of biologists and mathematicians in Arizona: *Why Don't All Whales Have Cancer*? Except for belugas in the polluted St. Lawrence estuary, whale cancer appears to be uncommon.

For mice the cancer rate is high. At first that didn't seem so strange. There is an inverse correlation between life span and pulse rate. During a typical lifetime an elephant and a mouse will each use up roughly a billion heartbeats. The mouse will just do it much faster. With a metabolism on so high a burn, it seems sensible that mice might get more cancer. But what is true for the mouse is not true for other tiny mammals. Birds, despite their frenzied metabolic rate (a hummingbird's heart can beat more than a thousand times a minute) appear to get very little cancer. If you graph mammalian size against cancer rate there is no telltale sloping line, just a scattering of dots.

Scientists have proposed several reasons for why cancer doesn't correlate smoothly with size. While larger animals may indeed get more mutations, they might also have evolved more effective means for repairing DNA, or for warding off tumors in other ways. The authors of the Arizona paper suggested how that might occur: hyper tumors. Cancer is a phenomenon in which a cell begins dividing out of control and accumulating genetic damage. Its children, grandchildren, and great-grandchildren go on to spawn broods of their own – subpopulations of competing cells, each with a different combination of traits. The stronger contenders – those that have evolved an ability to grow faster than the others or to poison their neighbors or to use energy more efficiency – will gain an upper hand. But before they can dominate, the authors proposed, they might become susceptible to "hyper tumors ": clusters of weaker cancer' cells opportunistically trying to latch on for a free ride. These parasites would sap energy continuously, destroying the tumor or at least keeping it in check. In large, long lived animals cancer develops gradually enough for the leeches to form. They may indeed get more tumor, but they are much less likely to grow to a noticeable size. Cancer that can get cancer.

Excerpted from pages 18-19 of 'The Cancer Chronicles' by George Johnson

The author cites the example of the hummingbird in the second paragraph in order to –

A) to lay out a physical dimensions of a range of animals   B) to rule out a hypothesis
C) to contrast variation of pulse rates with life span.   D) to invalidate Peto's paradox

Question No. : 33

Which of the below could be the most valid objection to labelling a hyper tumour a parasite?

A) The evolution of a parasite rivals the evolution of a host.
B) Parasites are organisms that can have part of their reproductive cycle outside a host.
C) Uncontrolled tissue growth, even when caused by mutations, is still the host DNA.
D) Parasites generally cause more harm than good.

Question No. : 34

The last sentence of the second paragraph has been edited out of the passage. It is shown below for your reference.

In our _____, each species seems like an exception.

Which word will best fit the blank?

A) opinion   B) ignorance   C) understanding   D) sample

Section : DI & Reasoning

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

Question No. : 35

Five students, Anish, Devashish, Kshitij, Riddhi and Sanika appeared for ten tests, T1 to T10. Each of these students was placed first to fifth in these tests, with no two students securing the same place in any particular test. The students were awarded 30 points for first place, 20 points for second place, 10 points for third place and 0 points for the fourth and the fifth place.

The table below shows the total points awarded to the five students in the first five tests, T1 to T5.

Tests T1 to T5					
Student	Anish	Devashish	Kshitij	Riddhi	Sanika
Points	70	150	50	10	20

In these five tests, one student secured first place in all five tests and one student secured the second place in exactly three tests.

The table below shows the total points awarded to the five students in the last five tests, T6 to T10.

Tests T6 to T10					
Student	Anish	Devashish	Kshitij	Riddhi	Sanika
Points	60	40	80	40	80

In these five tests, two students scored the first place in exactly two tests each and one student scored the third place in exactly three tests.

If Sanika has secured first place in exactly one test, which of the following is definitely true?

A) Anish has secured second place in exactly two tests   B) Devashish has secured second place in exactly two tests
C) Kshitij has secured first place in exactly two tests   D) Riddhi has secured second place in exactly two tests

Question No. : 36

If Anish secured first place in exactly one test, which of the following is definitely true?

A) Devashish has secured second place in at least one test   B) Kshitij has secured second place in at least two tests
C) Riddhi has secured first place in at least one test   D) Sanika has secured second place in at least two tests

Question No. : 37

If Anish secured first place in exactly two tests, which of the following is definitely false?

A) Devashish has secured third place in exactly one test   B) Devashish has secured second place in exactly two tests
C) Riddhi has secured second place in exactly two tests   D) Sanika has secured third place in exactly three tests

Question No. : 38

If Kshitij has secured first place in exactly one test, which o the following is definitely false?

A) Anish has secured second place in exactly three tests   B) Devashish has secured second place in exactly three tests
C) Riddhi has secured second place in exactly two tests   D) Saniks has secured second place in exactly two tests

DIRECTIONS for the question: *Go through the graph and the information given below and answer the question that follows.*

Question No. : 39

A cellular phone manufacturer has 10 plants, A to J across the country. The table below shows the production capacity (number of units that can be manufactured) and operating efficiency (number of units actually manufactured) as a percentage of production capacity for plants A to E.

Production Capacity	Operating Efficiency

A	6250	60.00%
B	8500	75.00%
C	8000	63.50%
D	8750	74.00%
E	6000	72.00%

Plants F and G have the highest and the smallest production capacities respectively. Only plants I and J have the same production capacity. The production capacity of plant I is half as much as that of plant F. The production capacity of plant H is 85% that of plant J. The production capacity of plant G is 52% that of plant A. Plant G operates at the same efficiency as that of plant E, while plants H and I operate at 70% efficiency each. Plant F manufactures 3600 units more than plant J. 40% of the total production capacity of plants A to J is manufactured by plants A to E. The overall operating efficiency of the 10 plants is 70.33%.

What is the overall operating efficiency of plants A to E?

A) 69.33%   B) 79.33%   C) 59.33%   D) 75%

Question No. : 40

What is the overall operating efficiency of plants F to J?

A) 71.69%   B) 74.34%   C) 83.33%   D) 95%

Question No. : 41

If the ten plants are arranged in descending order of production capacity, what is the overall operating efficiency of the top five plants in this list?

A) 69.71%   B) 74.75%   C) 64.33%   D) 51.25%

Question No. : 42

If the ten plants are arranged in descending order of number of units manufactured, what is the overall operating efficiency of the top five plants in this list?

A) 71.52%   B) 79.75%   C) 75%   D) 59.65%

DIRECTIONS for the question: Go through the graph and the information given below and answer the question that follows.

Question No. : 43

Each of the 60 rooms in a hotel is occupied on Wednesday, Thursday, Friday and Saturday. One or more of three newspapers, the Daily Overview, the Daily News and the Daily Post, are delivered to each of the occupants of these rooms on each of these four days. The total number of newspapers delivered on Wednesday, Thursday, Friday and Saturday are 68, 76, 90 and 113 respectively. The number of copies of the Daily Overview delivered is the same on all four days. At least 20 copies of the Daily News were delivered on Wednesday. The same number of copies of the Daily News and the Daily Post were delivered on Wednesday. The number of copies of the Daily News delivered on Wednesday through Saturday form a reducing arithmetic progression. The number of copies of the Daily Post delivered on Wednesday through Saturday increases by 50% as compared to the number of copies of the Daily Post delivered the day before.

How many copies of the Daily Overview were delivered each day? (in numerical value)

A) 20   B)   C)   D)

Question No. : 44

How many copies of the Daily News were delivered on Saturday? (in numerical value)

A) 12   B)   C)   D)

Question No. : 45

How many copies of the Daily Post were delivered on Saturday (in numerical value)?

A) 81   B)   C)   D)

Question No. : 46

Over the four day period, how many more copies of the Daily Post were delivered than copies of the Daily News? (in numerical value)

A) 123   B)   C)   D)

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

Question No. : 47

The line graph below shows the number of foreigners, in lakhs, visiting India in each quarter of 2009, 2011 and 2013.
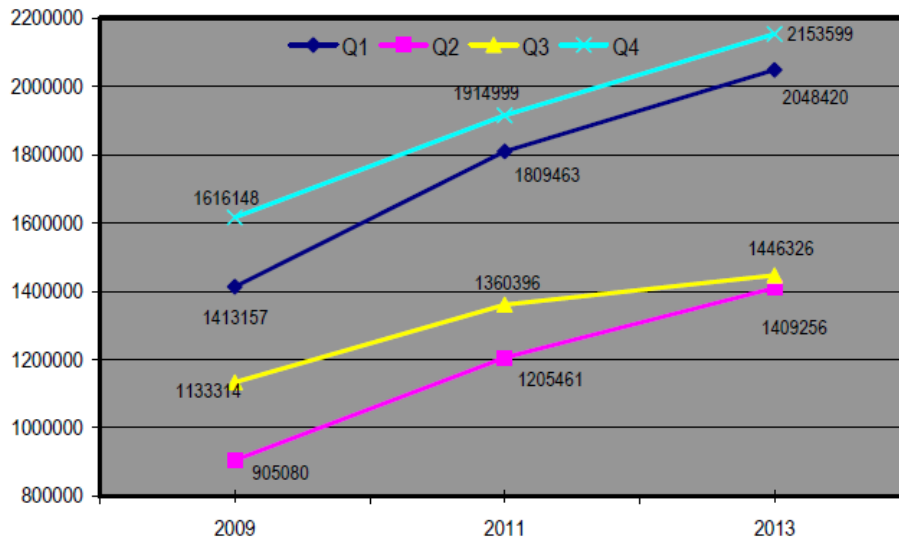
The table below shows the percentage change in the number of foreigners visiting India in a particular quarter of a given year vis-a-vis the same quarter in the previous year.

Year	2009	2010	2011	2012	2013	2014
Quarter 1	−11.85	15.56	10.80	8.80	4.05	3.82
Quarter 2	−10.12	20.27	10.74	4.15	12.25	0.55
Quarter 3	−2.04	11.06	8.08	−1.28	7.69	10.00
Quarter 4	6.63	11.08	6.67	4.99	7.11	6.01

Approximately how many foreigners visited India in Quarter 1 of 2008?

A) 1246000   B) 1263500   C) 1603000   D) 5282500

Question No. : 48

What is the approximate difference between the number of foreigners visiting India in Quarter 4 of 2008 and Quarter 4 of 2014?

A) 170500   B) 515850   C) 767400   D) 2476100

Question No. : 49

In how many years from 2009 to 2013, both inclusive, has the total number of foreigners visiting India in the four quarters of the year exceeded 60 lakhs?

A) 0   B) 2   C) 3   D) 4

Question No. : 50

Approximately how many more foreigners visited India in the four quarters of 2014 than in the four quarters of 2008?

A) 17.8 lakhs   B) 19.9 lakhs   C) 21.4 lakhs   D) 23.6 lakhs

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

Question No. : 51

The following figure shows the steps in the multiplication of a 3-digit integer, (AAC) by a 2-digit integer, (DD).Each of the letters A, B, C and D represents a distinct prime number.

```
      A A C
    × D D
    B D B C
  B D B C 0
    B C C A C
```

Which of the following is the value of the product D × (BAC)?

A) (BC) × (A × C) + (BC)   B) (AC) × (B × C) + (AC)   C) (DC) × (B × C) + (DC)   D) None of these

Question No. : 52

The following figure shows the steps in the multiplication of a 3-digit integer, (AAC) by a 2-digit integer, (DD).Each of the letters A, B, C and D represents a distinct prime number.

```
      A A C
    × D D
    B D B C
  B D B C 0
    B C C A C
```

What is the value of (BDD)^2 – (A × D × B)^2?

A) (CBCBC)   B) (DCDCC)   C) (CDCCAC)   D) (CACBC)

Question No. : 53

The following figure shows the steps in the multiplication of a 3-digit integer, (AAC) by a 2-digit integer, (DD).Each of the letters A, B, C and D represents a distinct prime number.

```
      A A C
    × D D
    B D B C
  B D B C 0
    B C C A C
```

Which of the following is not the value of A + B + C + D?

A) (B × C) + A   B) (D × C) + 2   C) (B × D) + (A + C)   D) (A × B) + D

Question No. : 54

The following figure shows the steps in the multiplication of a 3-digit integer, (AAC) by a 2-digit integer, (DD).Each of the letters A, B, C and D represents a distinct prime number.

```
    A A C
  × D D
  B D B C
 B D B C 0
  B C C A C
```

What is the value of the product (AAC) × (DD)?

A) 25575   B) 25535   C) 75525   D) 75535

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

Question No. : 55

Children from three families, the Lalwanis, the Mangwanis and the Nagranis, are working on five different projects, P1, P2, P3, P4 and P5. The Lalwanis have two children, Anay and Bhairavi, the Mangwanis have four children, Chetan, Divya, Esha and Gautam and family Nagranis has three children Hetal, Rohit and Sohum. Children from each family have at least one laptop per project they are working on. P1 is done by Anay, Chetan, Divya and Hetal, P2 is done by Anay, Bhairavi, Divya and Gautam, P3 is done by Divya, Hetal and Sohum, P4 is done by Chetan, Gautam and Rohit and P5 is done by Bhairavi, Esha, Rohit and Sohum.

How many children need not have laptops for any project?

A) 0   B) 1   C) 2   D) 3

Question No. : 56

Which child will definitely not have a laptop for any project?

A) Chetan   B) Esha   C) Gautam   D) Sohum

Question No. : 57

If the total number of laptops with the three families is the minimum possible, how many projects have exactly two laptops?

A) 0   B) 1   C) 2   D) 3

Question No. : 58

If the total number of laptops with the three families is the minimum possible, how many projects have exactly four laptops?

A) 0   B) 1   C) 2   D) 3

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

Question No. : 59

A cube of side 7 cm is cut into smaller cubes of side 1 cm by making cuts along all edges. The cubes in each row of the bottom layer are numbered 1 through 7 from left to right, then 8 through 14 and so on till the last row in the bottom layer is numbered 43 to 49. This process is repeated for all rows in all layers till the last cube is numbered 343.

What is the sum of the numbers on the cubes that lie on the longest diagonal starting at the vertex of the cube numbered 1? Type your answer in the box provided below.

A) 1204   B)   C)   D)

Question No. : 60

What is the sum of the numbers on the cubes that lie on the longest diagonal starting at the vertex of the cube numbered 49? Type your answer in the box provided below.

A) 1204   B)   C)   D)

Question No. : 61

What is the sum of the numbers on the cubes that lie on the diagonal of the surface containing the cubes numbered 7 and 343?
Type your answer in the box provided below.

A) 1225   B)   C)   D)

Question No. : 62

What is the sum of the numbers on the cubes that lie on the diagonal of the surface containing the cubes numbered 49 and 337?
Type your answer in the box provided below.

A) 1351   B)   C)   D)

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

Question No. : 63

Four students, A, B, C and D have qualified for the finals of a Sudoku competition. Each of them is given the same set of four Sudoku puzzles to be solved in 10 minutes each. Each correctly solved Sudoku puzzle earns the student 10 points. For any correctly solved Sudoku puzzle finished before time, the students earn an additional 2 points for every complete minute saved. Each of the four students has solved at least one Sudoku puzzle correctly and no two students have solved the same number of puzzles correctly. The student who has the second highest points is 12 points behind the student who scored the highest number of points. The students who came last and second last have scored the same number of points, but the student with the higher number of correctly solved Sudoku puzzles is ranked higher. A saved a total of 12 minutes on his correctly solved puzzles, B saved a total of 5 minutes on his correctly solved puzzles, C saved a total of 1 minute on his correctly solved puzzles and D could not save any time on his correctly solved puzzles.

The student who placed third had solved how many Sudoku puzzles correctly?

A) 1   B) 2   C) 3   D) 4

Question No. : 64

Who solved four Sudoku puzzles correctly?

A) A   B) B   C) C   D) D

Question No. : 65

Who had solved the least number of puzzles correctly?

A) A   B) B   C) C   D) D

Question No. : 66

What is the difference between the number of puzzles solved correctly by the student who was placed first and the student who was placed third?

A) 1   B) 2   C) 3   D) 4

Section : Quantitative Ability

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

Question No. : 67

A man is 6 years older than his wife. He noticed 4 years ago that he has been married to her exactly half of his life. How old will he be on their 50th anniversary if in 10 years she will have spent two-thirds of her life married to him? (in years)

A) 76   B)   C)   D)

Question No. : 68

Let $n \geq 4$. The integers from 1 to n inclusive are arranged in some order around a circle. A pair (a, b) is called acceptable if $a < b$, a and b are not in adjacent positions around the circle and at least one of the arcs joining a and b contains only numbers that are less than both a and b. The number of acceptable pairs is equal to :

A) n B) $(n-1)$ C) $(n-2)$ D) $(n-3)$

Question No. : 69

If $(323)^j = (17)^k \times (19)^m$, then which of the following is true?

A) $\dfrac{1}{j} + \dfrac{1}{k} = \dfrac{1}{m}$ B) $k + m = \dfrac{1}{j}$ C) $1/k + 1/m = 2/j$ D) None of these

Question No. : 70

In cinema at the city mall there are 55 chairs in a row, all of them initially unoccupied. From time to time, a person enters the lounge and sits in one of the unoccupied chairs and if either of the neighboring chairs is occupied at that moment, one of the neighbors get up immediately and leaves. What is the maximum number of chairs that can be occupied at any given time?

A) 27   B) 28   C) 54   D) 47

Question No. : 71

For every positive integer n, the integer $1 + 5^n + 5^{2n} + 5^{3n} + 5^{4n}$ is (write the correct option)

1. Composite   2. Prime   3. Odd   4. None of these

A) 1   B)   C)   D)

Question No. : 72

A milk merchant buys certain number of cans full of milk. If he sells milk at Rs. 13 per litre, he gains Rs. 333. But if he sells milk at Rs. 10 per litre, he loses Rs. 150. How many such cans did be buy, if the capacity of each can is 23 litres?

A) 5   B) 7   C) 9   D) 17

Question No. : 73

Find the integer n for which $S = 2^{1994} + 2^{1998} + 2^{1999} + 2^{2000} + 2^{2002} + 2^n$ is a perfect square. (write the correct option)

1. 2002   2. 2003   3. 2004   4. Infinite values

A) 1   B)   C)   D)

Question No. : 74

A merchant sold an article at a profit of 40%. Had he bought the article for 20% less and sold it at a discount of 20%, he would have gained Rs. 224. What was the merchant's profit from the sale of the article?

A) Rs. 700   B) Rs. 280   C) Rs. 560   D) Rs. 980

Question No. : 75

Every Wednesday at the Pizza Express, the manager gives away free slices of pizza and sodas. Every 6th customer gets a free slice of pizza and every 8th customer gets a free soda. The Pizza Express served 75 customers last Wednesday. How many customers received both a free slice of pizza and a free soda? (in numerical value)

A) 3   B)   C)   D)

Question No. : 76

The smallest integer that is a square and whose decimal representation starts with 2005. (in numerical value)

A) 2005056   B)   C)   D)

Question No. : 77

Of 90 MBA students, 43 study Marketing, 18 study HR and 27 study Finance. 8 students study HR and Marketing, 11 students study Marketing and Finance and 7 students study HR and Finance. 3 students are studying all 3 specialisations.

What percent of the students study none of the three specializations?

A) 24.4%   B) 27.7%   C) 28.6%   D) 38.4%

Question No. : 78

Of 90 MBA students, 43 study Marketing, 18 study HR and 27 study Finance. 8 students study HR and Marketing, 11 students study Marketing and Finance and 7 students study HR and Finance. 3 students are studying all 3 specialisations.

What is the ratio of the number of students who study exactly two of the three specializations to the number of students who study none of the three specializations?

A) 4 : 5   B) 4 : 9   C) 22 : 25   D) 17 : 25

Question No. : 79

$10^{2008} - 10^8$ is divisible by: (write the correct option)

1. 2007   2. 2008   3. 2009   4. 2010

A) 2   B)   C)   D)

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

Question No. : 80

If the integers from 1 to 222,222,222 are written down in succession, how many of them have at least one zero?

A) 125367100   B) 123567100   C) 132567100   D) 135267100

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

Question No. : 81

An integer whose decimal representation consists of $3n$ identical digits is divisible by (write the correct option)

1. $3n$ 2. 3^n 3. $3n^2$ 4. None of these

A) 2   B)   C)   D)

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

Question No. : 82

There are M gold fish and K silver fish in a lake. They are caught and eaten one at a time at random until only one color of fish remains in the lake. One of the silver fish is named George. The probability that George is not eaten: (write the correct option)

1. 1/ (K+M)   2. 1/ M   3. 1/ (M+1)   4. (1/ M) + (1/K)

A) 3   B)   C)   D)

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

Question No. : 83

Three hundred men sit around a circular table. The men are numbered 1–300 and each man has two neighbors. (The neighbors of 1 are 2 and 300, and the neighbors of 300 are 1 and 299.)

There are three hundred waiters, also numbered from 1 to 300. Each waiter has an urn containing three balls, one lettered L, one C and one R. Each waiter y draws a ball at random from his urn and if the ball is lettered L, delivers a dessert to the man to the left of man y. If the letter is C man y gets the dessert, and if the letter is R the man to the right of man y gets the dessert. Call a man lucky if he gets three desserts. What is the probability of the greatest possible number of men to be lucky? (write the correct option)

1. $1/3^{301}$ 2. $1/3^{300}$ 3. $1/3^{299}$ 4. $1/3^{298}$

A) 3   B)   C)   D)

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

Question No. : 84

Given that x and y are positive integer solutions of the equation $x^3 - y^3 = xy + 61$, what is the value of $(x + y)$? (in numerical value)

A) 11   B)   C)   D)

Question No. : 85

An urn has four balls numbered 1, 2, 3, 4. They are drawn one at a time at random with replacement, that is, a ball is drawn, its number is noted, and the ball is replaced and the urn is mixed before the next draw. The draws continue until a number is drawn that is smaller than a previously drawn number. Find the probability that the last number drawn is 1. (write the correct option)

1. 29/81   2. 27/81   3. 43/81   4. 47/81

A) 2   B)   C)   D)

Question No. : 86

Let C be a circle in the xy-plane with center on the y-axis and passing through A = (0; a) and B = (0; b) with 0 < a < b. Let P be any

other point on the circle, let Q be the intersection of the line through P and A with the x-axis, and let O = (0; 0), then $\angle BQP$ = _____.

A)   B)   C)   D) None of these

   $\angle OBQ$ $\angle OPQ$ $\angle BOP$

Question No. : 87

Any integer greater than or equal to 7 can always be written as a sum of

A) Two Primes   B) An odd and an even integer   C) Sum of Squares of two primes   D) Two co-primes

Question No. : 88
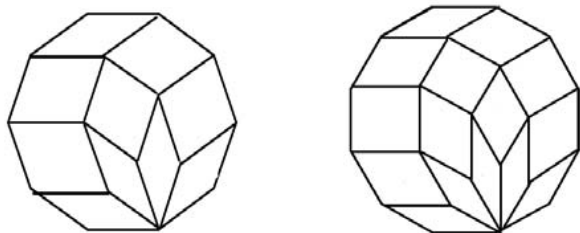
A regular decagon and a regular dodecagon have been tiled with rhombuses. In each case, the sides of the rhombuses are the same length as the sides of the regular polygon.

How many rhombuses will be there in a tiling by rhombuses of a 2002-gon?

A) 2002   B) 500 × 1001   C) 1000 × 1001   D) 1000 × 2002

Question No. : 89

Let N be the number of ordered pairs (x,y) of integers (positive, negative, or zero) such that $x^2 + xy + y^2 \leq 2007$, then N is

A) Odd   B) Even   C) Prime   D) None

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

Question No. : 90

If a triangle (with non-zero area) is constructed with the lengths of the sides chosen from the set{2,3,5,8,13,21,34,55,89,144}, then this triangle must be

A) Scalene   B) Isosceles   C) Right angled   D) Obtuse angled

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

Question No. : 91

A shadow in the sun cast by a tree is 48 ft. At the same time, a shadow cast by a nearby post is 15 ft. If the line of sight distance from the farthest end of the tree's shadow to the top of the tree is 62 ft., what is the line of sight distance from the top of the post to the farthest end of the post's shadow?

A) 18.1 ft.   B) 19.4 ft.   C) 22.9 ft.   D) 14.1 ft.

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

Question No. : 92

Two sentries start at point B. Sentry 1 walks back and forth between points A and B, taking 28 seconds to make the complete trip. Sentry 2 walks back and forth between points B and C, taking 90 seconds for the trip. Both are unwavering in their pace. How many seconds after they start will the two first meet back at point B again? (In seconds).

A) 1260   B)   C)   D)

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

Question No. : 93

The percentage profits on three articles A, B, and C is 10%, 20% and 25% and the ratio of their cost price is 1:2:4. Also, the ratio of the number of articles sold of A, B and C is 2:5:2.The overall profit percentage is:

A) 15   B) 17   C) 19   D) 21

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

Question No. : 94

Venkat borrowed Rs. 45,000 from bank at 10% compound interest. He repaid the sum in three annual instalments, which were in arithmetic progression. He ended up paying Rs. 54,000 in all. How much did he pay in the first year? (in Rs.)

A) 19500   B)   C)   D)

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

Question No. : 95

A and B stand at distinct points of a circular race track of length 120m. They run at speeds of a m/s and b m/s respectively. They meet for the first time 16 seconds after they start the race and for the second time 40 seconds from the time they start the race. Now, if B had started in the opposite direction to the one he had originally started, they would have meet for the first time after 40 seconds. If B is quicker than A, find B's speed. (write the correct option)

1. 3m/s   2. 4 m/s   3. 5 m/s   4. 8 m/s

A) 3   B)   C)   D)

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

Question No. : 96

The traffic on a certain east-west highway moves at a constant speed of 60 miles per hour in both directions. An eastbound driver passes 20 west-bound vehicles in a five minute interval. Assume vehicles in the westbound lanes are equally spaced. Which of the following is the closest to the number of westbound vehicles present in a 100-mile section of highway?

A) 120   B) 200   C) 240   D) 400

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

Question No. : 97

A merchant buys 80 articles, each at Rs. 40. He sells *n* of them at a profit of *n*% and the remaining at a profit of (100 – *n*)%. What is the minimum profit the merchant could have made on this trade?

A) Rs. 2160   B) Rs. 1420   C) Rs. 1580   D) Rs. 2210

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

Question No. : 98

In a movie, an RAW agent has to stop a ticking time bomb within 10 seconds by cutting one wire from a group of 4 indistinguishable red wires and another wire from a group of 5 indistinguishable green wires. There is exactly one combination that would stop the bomb from exploding. What is the probability that the FBI agent will succeed if he or she randomly cuts a red wire and a green wire?

A) 5%   B) 20%   C) 25%   D) 45%

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

Question No. : 99

Every birthday of my life, my mother has seen to it that my cake contains my age in candles. Starting on my fourth birthday, I have always blown out all my candles. Before that age, I averaged a 50% total blowout rate. So far, I have blown out exactly 900 candles. How old am I? (in numerical value)

A) 42   B)   C)   D)

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

Question No. : 100

What is the largest possible area of a simple quadrilateral, two sides of which have length *a*, and two sides of which have length *b*?

A) $ab/2$ B) ab C) $2ab$ D) $a^2b^2/(a + b)$

QNo:- 1 ,Correct Answer:- 1

Explanation:- Option 1.
The paragraph is talking about what evils can newly acquired freedom entail, and then how as time passes the chaos leads to order and system.
2 – Is incorrect as the paragraph ends with a positive note – that the chaos leads ultimately to order and system.
3 – Is incorrect as the paragraph talks about letting the people be and that after a few years they learn to reason and a system of justice and order prevails
4 – Is incorrect as the paragraph doesn't hint at any seize the opportunity or something like that. Moreover it ends on a positive note
mayhem is guaranteed.

QNo:- 2 ,Correct Answer:- 4

Explanation:- The paragraph states that one must sacrifice what one loves the most. While at the end of the paragraph it is stated that a wise man loves truth, values and the Divine, how can he sacrifice the same?
1 – it is stated explicitly in the paragraph
2 - The paragraph does not talk about material gain
3 - The paragraph states that you sacrifice that which you like the most or which gives you pleasure and joy. There is no mention that indirect pleasure is the only characteristic of sacrifice.

QNo:- 3 ,Correct Answer:- 1

Explanation:- In the declaration of Independence, Thomas Jefferson initially referred to the American Colonists as subjects but then had written over it the word citizens. We can thus infer that initially under the colonial rule the people thought themselves to be subjects of the Queen, however on gaining independence, Jefferson used citizens and erased subjects, for he thought that now the loyalty was not to the Queen but to themselves, the people of America.
2 – In fact, the opposite was true. Independence meant that they were no more bound to the Queen, so were not subjects any longer.
3 – There is no word in the paragraph which can be an evidence to show that the Colonial rule was been belittled and this was demonstrated by replacing subjects by citizens.
4 - Jefferson actually wanted to move away from subjects rather than gave it any importance

QNo:- 4 ,Correct Answer:- D

Explanation:- The colloquial way of saying it would have been 'Obviously'. Option 4 represents that idea – in a more formal language.

1 – is a literal translation
2 – by definition would have been acceptable, but by theory stinks..
3 – though the passage talks about observation, but in this context observation is not relevant.

QNo:- 5 ,Correct Answer:- A

Explanation:- Metaphysics – means based on abstract reasoning. The opposite of that would be concrete.
A- Ontic means relating to real.
C - In english "Wirklichkeit" is translated to actuality, objectivity, substantiality, realness, reality, truth, etc.

B – classical means traditional. In a way it is related to real, but is not the exact antonym.
D - Gestalt is an organized whole that is perceived as more than the sum of its parts.

QNo:- 6 ,Correct Answer:- C

Explanation:- 19th century science is Newtonian science, which believes that what cannot be observed, is not science. Option 3 re-states this.
1 and 4 are referring to the quantum physics era, which is very 20th century.
2 – is a tenet common to both 19th and 20th century science. Note the usage of the word exclusively in the question body.

QNo:- 7 ,Correct Answer:- C

Explanation:- The author is propagating the method of Durr, who is trying to convey that scientists and laymen should change their world view away from being fans of concrete things and certainty to abstract uncertainty. This is what is signified in the web of relationships.

1 – is the opposite of what the passage is trying to convey.
2 – It is more about a philosophy than scientific method
4 – The adjective quantum missing before the noun physics, else would have been Ok.

QNo:- 8 ,Correct Answer:- A

Explanation:- What the author is trying to convey is that we sense everyday objects as firm and real – but they are actually not. Matter is at heart, energy. We see it as an object because we are sensing an average energy. In the time that we take to touch a thing, its dimensions have changed millions of times – we are only touching an average position. This philosophy is reflected in the electron – energy analogy.

2 – it only exists in one state.
3 – is correct, but does not relate to the averaging.
4 – True, yet not relevant again.

QNo:- 9 ,Correct Answer:- C

Explanation:- Refer to the last paragraph
Centralisation is mainly an idea of order; decentralisation, one of freedom. The man of order is typically the accountant and, generally, the administrator: while the <u>man of creative freedom is the</u> <u>entrepreneur</u>. Order requires intelligence and is conducive to efficiency; while freedom calls for. and opens the door to, intuition and leads to innovation.
Note that bean counter means a Finance guy.

QNo:- 10 ,Correct Answer:- C

Explanation:- The passage is arguing that there is always a struggle between order and creativity, yet both are important. This is what is said by option 3.
1 – is biased towards creativity.
2 – is just a statement of fact about large organizations; does not contain the author's opinion.
4 – is a specific warning about the dangers of 'excessive' order in the case of big organizations.

QNo:- 11 ,Correct Answer:- A

Explanation:- A paradox is a statement which seems at first look to be combining opposites – counterintuitive, but on a closer scrutiny – contains some truth in it. Big and Small are opposites. But searching for smallness inside bigness is not all that futile an exercise – as discussed by the passage.
2 – A hyberbole is an exaggeration.
3 – An Irony is when you expect something, and something totally different happens
4 – A metaphor is an implied comparison.

QNo:- 12 ,Correct Answer:- B

Explanation:- Siddharth's book is on Human Trafficking. Trafficking means exploitation – hence involuntary. Whereas Meena talks about responsible adults engaging in a profession by choice.
1 – Gets the order reversed.
3 – Siddharth's opinions on the trade are more economic. The passage does not talk about his views on rehabilitation et al.
4 – Meena's beliefs are to the contrary – she believes that sex workers do not trust the police.

QNo:- 13 ,Correct Answer:- C

Explanation:- This is the sentence: By not treating them as sex workers, their agency is being denied to them and consequently their rights. This is indicating that there is a connection of rights or self-determination. 3 fits in best in this context.
The remaining options are also correct definitions of agency, but are not relevant ones.

QNo:- 14 ,Correct Answer:- D

Explanation:- The key word here is practical. What is important is that it should be implementable.
It is mentioned in the passage that we should not worry about people who voluntarily engage in the sex trade. But if the same people want to leave, then there should be no coercion. This is what a safe mobility policy will ensure.
1 – Is a solution that will solve a lot of problems for our country. But how practical is it?
2 – The distrust of the police by the sex workers will make this policy impractical.
3 – In India, with only 5% of the workforce in the tax bracket, it is unlikely that we can impose taxation on this industry.

QNo:- 15 ,Correct Answer:- B

Explanation:- The passage is indicating that earning from sex is acceptable.
1 – to abuse is to misuse.
3 – person is blackmailed or shamed by a sharing with others on social media
4 – meaning that she is involuntarily forced to part with a share of her earnings to a pimp.

QNo:- 16 ,Correct Answer:- A

Explanation:- The passage talks of involving sex workers themselves in debating actions about their future – hence empowerment. It also talks of allowing them to move out, if they wish to – in which case integrating them back into society would be important.
2 – This is the current policy, which the authors seem to be unhappy with.
3 – Construction workers and rag pickers are mentioned as workers who suffer from health hazards, not as sex workers.
4 – This pre-assumes that all sex workers wish to move out of their current profession.

QNo:- 17 ,Correct Answer:- C

Explanation:- Refer to first para: we recognize what simplicity is when we see it.
1 is a great example – but a poor definition.
2. Talks of an interconnectedness of two fields, so in a way introduces complexity, not simplicity.
4. Very aptly said. Most of you have probably experienced friendship, but not marriage, so will take some time to digest this one. Unfortunately this fact is not so easily recongnizable – and marriage also does not meet the bar of being predictable, cheap or stackable

QNo:- 18 ,Correct Answer:- C

Explanation:- If we define complexity as being what simplicity is not, then we get the following characteristics:
Unpredictable

Expensive
Unstackable
If we evaluate the options on these criteria, traffic wins hands down.
1. Cellphones are made from the same ICs, as the internet, hence ruled out.
2. Search engines run on very simple algorithms – like PageRank used by Google.
4. Cathedrals are made of bricks – which meet all the criteria of simplicity.

QNo:- 19 ,Correct Answer:- C

Explanation:- *At this point the technology is not stackable, but if this test can be extended to other tests, it will become stackable.*
1. It is predictable, because it uses a single technology of chemicals.
2. It is cheap because it uses the same technology that you use for printing books using paper.
4. It is reliable, because it uses no electricity.

QNo:- 20 ,Correct Answer:- B

Explanation:- *We are looking at something which represents difficult – intractable means that.*

1 – unpredictable in many ways does not gel well. Unpredictable itself is enough.
3 – convoluted is a synonym for complexity
4 – radical is a synonym of fundamental.

QNo:- 21 ,Correct Answer:- 15243

Explanation:-
The paragraph talks about the development in acoustic detection devices, and then about how bioacoustics has no longer remained a secondary field of research. Then it talks about the developments in the twentieth century and then how in the twenty first century, bioacoustics has become a mature independent discipline.

QNo:- 22 ,Correct Answer:- 23154

Explanation:- The paragraph talks about handwriting and whether changing the handwriting can create brand new characteristic traits in children. The author thinks it's silly to think so and that graphology is a misguided concept which attempts to nail down the mystery of personality and the mind.

QNo:- 23 ,Correct Answer:- 25341

Explanation:- Option 1. The paragraph talks about fairy tales princesses and how mothers squirm when these stories are read by the impressionable children as these stories show the heroines to be really foolish and weak. The author feels that one should refrain from reading these stories which are sexist in nature – heroic boys and foolish heroines.

QNo:- 24 ,Correct Answer:- B

Explanation:- *A – waiting for someone to sort and sift ....*
B – Neither of these has ....
E – they will pass it on to ....

QNo:- 25 ,Correct Answer:- D

Explanation:-

A – took us across
B – a time for careful monitoring (monitoring is a gerund, and has to be modified by an adjective careful and not an adverb carefully

QNo:- 26 ,Correct Answer:- 2

Explanation:- The that in 3 refers to the point made in 1 that if regulatory limits on building heights and density were relaxed, then fewer plots of land would be needed and hence the rents collected by landowners would be reduced. 4 again talks about how the relaxation would lead to decline in property wealth relative to the economy.
2 then is the odd man out.

QNo:- 27 ,Correct Answer:- 2

Explanation:- The paragraph talks about books being more than just repositories of information. Now we can see that 1 and 3 are related as they both talk about the look and feel of a book. 2 then becomes the odd man out as though it can fit with 4, it cannot fit with the other two sentences.

QNo:- 28 ,Correct Answer:- B

Explanation:- Corporal punishment was used – but not often.
1 – Is a philosophy of instilling discipline by using the stick.
3 – Wrong because the stick was used.
4 – Should read the reverse – it was the Mom who used the stick, not the dad.

QNo:- 29 ,Correct Answer:- B

Explanation:- Darth Vader is the villain in Star Wars. The author says that his dad had a tone that combined Darth with Fred. We are looking at contrasts over here – so Dad was probably alternating between playing bad guy and nice guy.
1 – Darth Vader was, not Fred.
3 – Authors rarely have voices associated with them.
4 – Since Darth is referenced from films, Fred must also be from the same background.

QNo:- 30 ,Correct Answer:- C

Explanation:-
The author mentions that in their family's case the animosity would be gone after a few hours, when the boys would realize that they have done wrong – and deserved the punishment. He called that a whipping. He saw it as fair. By corollary, a beating was unfair – hence the continuing animosity.
1 –semantics is the science of meaning. In this case, the two words are implied as having different meanings.
2 – The question of who punishes is not important in the distinction between whipping and beating.
4 – This option confuses effect with cause. And also, if the animosity continues it is beating, not whipping.

QNo:- 31 ,Correct Answer:- C

Explanation:- The last sentence is: 'But appearances can be deceiving.' What he is implying is that whoever has received a beating in childhood will ALWAYS have animosity. No exceptions.
1 – The contrariness point is being ruled out by this statement.
2 – It is weakening the counterpoint, not reinforcing it.
4 – The author uses examples of kids with animosity in order to justify the opinion that beatings are bad, not invalidate the argument.

QNo:- 32 ,Correct Answer:- B

Explanation:-
The hypothesis that he initially stated in the second paragraph was that high metabolic rates can be the cause of cancer. He uses the example of mice to support this hypothesis – and uses the example of hummingbirds to rule it out.

1 – From the elephant to the mouse to the hummingbird is indeed a range of sizes – but the reason for citing the hummingbird is more than just the size.
3 – Pulse rate and life span have an inverse relationship. Yet the metabolic rate is ruled out as a cause for cancer.
4 – The proper word should have been to resolve the paradox. That happens, btw, in the third paragraph.

QNo:- 33 ,Correct Answer:- D

Explanation:- A parasite is usually a foreign organism that survives on the nutrition of a host. It does not have a symbiotic relationship – and can often lead to the death of the host. In short, it does more harm than good.
A hyper-tumor is a friend, in the sense that it is the enemy's enemy. So calling it a parasite may be wrong.

1 – the evolutionary rivalry does not have relevance to the nomenclature debate.
2 – can be considered to be an objection – but we can have examples to the contrary.
3 – this one does have a relevance to nomenclature – no distinct DNA. However the author uses the term parasite and leech in an analogy sense.

QNo:- 34 ,Correct Answer:- B

Explanation:-
A scientist will always use correlation to try to establish a cause. If there is no correlation, it does not mean that there is no cause. It means that a new variable has to be tried out. So after this failed experiment to establish a correlation between metabolic rate and cancer, the only thing we can conclude is that we don't still know. (The third paragraph goes on to shed light on a possible correlation). Hence the word that fits best is ignorance.

1 – science is based more on facts than opinions
3 – the understanding is flawed.
4 – a possible fit, yet the paragraph does not talk about how many dots are there in the graph – in other words we don't know how big or small the sample size was. If it is a small one, then the likelihood of error is higher. If it is big, then the word sample is a misfit.

QNo:- 35 ,Correct Answer:- C

Explanation:-
From the 1st table, it is obvious that Devashish secured 1st place in all 5 tests to get a total of $30 \times 5 = 150$ points. Since 1 student secured the 2nd place in exactly 3 tests, he or she will have a minimum of $20 \times 3 = 60$ points. From the 1st table, this student is obviously Anish and he has secured 3rd place in one test to get 10 points and secured 4th or 5th place in the remaining test to get 0 points so that he is awarded a total of 70 points. Since Riddhi has been awarded only 10 points, we know that she has secured the 3rd place in exactly 1 test and has secured 4th or 5th place in the remaining 4 tests. Consider Kshitij who has been awarded a total of 50 points. Kshitij could have secured 2nd place in 2 tests, 3rd place in 1 test and 4th or 5th place in the remaining 2 tests. In this case, Sanika must have secured 3rd place in 2 tests and secured 4th or 5th place in the remaining 3 tests. On the other hand, Kshitij could have secured 2nd place in 1 test, 3rd place in 3 tests and 4th or 5th place in the remaining test so that Sanika must have secured 2nd place in 1 test and 4th or 5th place in the remaining 4 tests. We can tabulate these possibilities as below.

	Case I-1	Case I-2
Anish	20+20+20+10+0	20+20+20+10+0
Devashish	30+30+30+30+30	30+30+30+30+30
Kshitij	20+20+10+0+0	20+10+10+10+0

Riddhi	10+0+0+0+0	10+0+0+0+0
Sanika	10+10+0+0+0	20+0+0+0+0

In the 2nd table, we know that 2 students have secured 1st place in exactly 2 tests each. These 2 students must therefore be awarded a minimum of 30 × 2 = 60 points each. These 2 students must be from amongst Anish, Kshitij and Sanika. We know that 1 students has secured 3rd place in exactly 3 tests and is awarded a minimum of 3 × 10 = 30 points.

Now, there are 2 scenarios – the first wherein the two students who have secured 1st place in exactly 2 tests have a total of 80 points each and the second wherein these 2 students have a total of 80 and 60 points.

	Case II-1	Case II-2	Case II-3	Case II-4
Anish	30+10+10+10+0	30+10+10+10+0	30+30+0+0+0	30+30+0+0+0
D or R	20+10+10+0+0	20+20+0+0+0	20+10+10+0+0	20+20+0+0+0
K or S	30+30+20+0+0	30+30+20+0+0	30+20+10+10+10	30+20+10+10+10
R or D	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0
S or K	30+30+20+0+0	30+30+10+10+0	30+30+20+0+0	30+30+10+10+0

If Sanika has secured 1st place in exactly one Test, then in tests T6 to T10, she has scored 30, 20, 10, 10 and 10, i.e., Cases II-3 and II-4.

Option 1 is obviously false, as in Cases I-1 and I-2, Anish has already secured 2nd place in 3 tests.
Option 2 can be eliminated by referring to Case II-4.
Option 3 is true in all cases.
Option 4 can be eliminated because in Case II-3, Riddhi could have scored 20, 10, 10 0 and 0.

QNo:- 36 ,Correct Answer:- A

Explanation:- From the 1st table, it is obvious that Devashish secured 1st place in all 5 tests to get a total of 30 × 5 = 150 points. Since 1 student secured the 2nd place in exactly 3 tests, he or she will have a minimum of 20 × 3 = 60 points. From the 1st table, this student is obviously Anish and he has secured 3rd place in one test to get 10 points and secured 4th or 5th place in the remaining test to get 0 points so that he is awarded a total of 70 points. Since Riddhi has been awarded only 10 points, we know that she has secured the 3rd place in exactly 1 test and has secured 4th or 5th place in the remaining 4 tests. Consider Kshitij who has been awarded a total of 50 points. Kshitij could have secured 2nd place in 2 tests, 3rd place in 1 test and 4th or 5th place in the remaining 2 tests. In this case, Sanika must have secured 3rd place in 2 tests and secured 4th or 5th place in the remaining 3 tests. On the other hand, Kshitij could have secured 2nd place in 1 test, 3rd place in 3 tests and 4th or 5th place in the remaining test so that Sanika must have secured 2nd place in 1 test and 4th or 5th place in the remaining 4 tests. We can tabulate these possibilities as below.

	Case I-1	Case I-2
Anish	20+20+20+10+0	20+20+20+10+0
Devashish	30+30+30+30+30	30+30+30+30+30
Kshitij	20+20+10+0+0	20+10+10+10+0
Riddhi	10+0+0+0+0	10+0+0+0+0
Sanika	10+10+0+0+0	20+0+0+0+0

In the 2nd table, we know that 2 students have secured 1st place in exactly 2 tests each. These 2 students must therefore be awarded a minimum of 30 × 2 = 60 points each. These 2 students must be from amongst Anish, Kshitij and Sanika. We know that 1 students has secured 3rd place in exactly 3 tests and is awarded a minimum of 3 × 10 = 30 points.

Now, there are 2 scenarios – the first wherein the two students who have secured 1st place in exactly 2 tests have a total of 80

points each and the second wherein these 2 students have a total of 80 and 60 points.

	Case II-1	Case II-2	Case II-3	Case II-4
Anish	30+10+10+10+0	30+10+10+10+0	30+30+0+0+0	30+30+0+0+0
D or R	20+10+10+0+0	20+20+0+0+0	20+10+10+0+0	20+20+0+0+0
K or S	30+30+20+0+0	30+30+20+0+0	30+20+10+10+10	30+20+10+10+10
R or D	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0
S or K	30+30+20+0+0	30+30+10+10+0	30+30+20+0+0	30+30+10+10+0

If Anish has secured 1st place in exactly 1 test, then we are looking at Cases I-1, I-2, II-1 and II-2.
Option 1 is true as Devashish could have secured 2nd place in 1 or 2 tests.
Option 2 can be eliminated on the basis of Cases I-2 and II-2.
Option 3 is ruled out as Riddhi has never secured 1st place.
Option 4 can be disproved by Cases I-1 and II-1.

QNo:- 37 ,Correct Answer:- A

Explanation:-

From the 1st table, it is obvious that Devashish secured 1st place in all 5 tests to get a total of 30 × 5 = 150 points. Since 1 student secured the 2nd place in exactly 3 tests, he or she will have a minimum of 20 × 3 = 60 points. From the 1st table, this student is obviously Anish and he has secured 3rd place in one test to get 10 points and secured 4th or 5th place in the remaining test to get 0 points so that he is awarded a total of 70 points. Since Riddhi has been awarded only 10 points, we know that she has secured the 3rd place in exactly 1 test and has secured 4th or 5th place in the remaining 4 tests. Consider Kshitij who has been awarded a total of 50 points. Kshitij could have secured 2nd place in 2 tests, 3rd place in 1 test and 4th or 5th place in the remaining 2 tests. In this case, Sanika must have secured 3rd place in 2 tests and secured 4th or 5th place in the remaining 3 tests. On the other hand, Kshitij could have secured 2nd place in 1 test, 3rd place in 3 tests and 4th or 5th place in the remaining test so that Sanika must have secured 2nd place in 1 test and 4th or 5th place in the remaining 4 tests. We can tabulate these possibilities as below.

	Case I-1	Case I-2
Anish	20+20+20+10+0	20+20+20+10+0
Devashish	30+30+30+30+30	30+30+30+30+30
Kshitij	20+20+10+0+0	20+10+10+10+0
Riddhi	10+0+0+0+0	10+0+0+0+0
Sanika	10+10+0+0+0	20+0+0+0+0

In the 2nd table, we know that 2 students have secured 1st place in exactly 2 tests each. These 2 students must therefore be awarded a minimum of 30 × 2 = 60 points each. These 2 students must be from amongst Anish, Kshitij and Sanika. We know that 1 students has secured 3rd place in exactly 3 tests and is awarded a minimum of 3 × 10 = 30 points.

Now, there are 2 scenarios – the first wherein the two students who have secured 1st place in exactly 2 tests have a total of 80 points each and the second wherein these 2 students have a total of 80 and 60 points.

	Case II-1	Case II-2	Case II-3	Case II-4
Anish	30+10+10+10+0	30+10+10+10+0	30+30+0+0+0	30+30+0+0+0
D or R	20+10+10+0+0	20+20+0+0+0	20+10+10+0+0	20+20+0+0+0
K or S	30+30+20+0+0	30+30+20+0+0	30+20+10+10+10	30+20+10+10+10
R or	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0

D				
S or K	30+30+20+0+0	30+30+10+10+0	30+30+20+0+0	30+30+10+10+0

If Anish has secured 1st place in exactly 2 tests, we are looking at Cases II-3 and II-4.

Option 1 is definitely false as Devashish could have secured 3rd place in 0 tests or 2 tests.

Option 2 could be true according to Cases I-1 and II-4.

Option 3 could be true according to Cases II-3 or II-4.

Option 4 could be true according to Cases I-2 and II-3.

QNo:- 38 ,Correct Answer:- B

Explanation:- *From the 1st table, it is obvious that Devashish secured 1st place in all 5 tests to get a total of 30 × 5 = 150 points. Since 1 student secured the 2nd place in exactly 3 tests, he or she will have a minimum of 20 × 3 = 60 points. From the 1st table, this student is obviously Anish and he has secured 3rd place in one test to get 10 points and secured 4th or 5th place in the remaining test to get 0 points so that he is awarded a total of 70 points. Since Riddhi has been awarded only 10 points, we know that she has secured the 3rd place in exactly 1 test and has secured 4th or 5th place in the remaining 4 tests. Consider Kshitij who has been awarded a total of 50 points. Kshitij could have secured 2nd place in 2 tests, 3rd place in 1 test and 4th or 5th place in the remaining 2 tests. In this case, Sanika must have secured 3rd place in 2 tests and secured 4th or 5th place in the remaining 3 tests. On the other hand, Kshitij could have secured 2nd place in 1 test, 3rd place in 3 tests and 4th or 5th place in the remaining test so that Sanika must have secured 2nd place in 1 test and 4th or 5th place in the remaining 4 tests. We can tabulate these possibilities as below.*

	Case I-1	Case I-2
Anish	20+20+20+10+0	20+20+20+10+0
Devashish	30+30+30+30+30	30+30+30+30+30
Kshitij	20+20+10+0+0	20+10+10+10+0
Riddhi	10+0+0+0+0	10+0+0+0+0
Sanika	10+10+0+0+0	20+0+0+0+0

In the 2nd table, we know that 2 students have secured 1st place in exactly 2 tests each. These 2 students must therefore be awarded a minimum of 30 × 2 = 60 points each. These 2 students must be from amongst Anish, Kshitij and Sanika. We know that 1 students has secured 3rd place in exactly 3 tests and is awarded a minimum of 3 × 10 = 30 points.

Now, there are 2 scenarios – the first wherein the two students who have secured 1st place in exactly 2 tests have a total of 80 points each and the second wherein these 2 students have a total of 80 and 60 points.

	Case II-1	Case II-2	Case II-3	Case II-4
Anish	30+10+10+10+0	30+10+10+10+0	30+30+0+0+0	30+30+0+0+0
D or R	20+10+10+0+0	20+20+0+0+0	20+10+10+0+0	20+20+0+0+0
K or S	30+30+20+0+0	30+30+20+0+0	30+20+10+10+10	30+20+10+10+10
R or D	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0	20+20+0+0+0
S or K	30+30+20+0+0	30+30+10+10+0	30+30+20+0+0	30+30+10+10+0

If Kshitij has secured 1st place in exactly 1 test, we are looking at Cases II-3 and II-4.

Option 1 is definitely true according to all possibilities.

Option 2 is definitely false as Devashish could have secured 2nd place in 1 or 2 tests.

Option 3 could be true according to Cases II-3 and II-4.

Option 4 could be true according to Cases I-1 and II-4 or Cases I-2 and II-3.

QNo:- 39 ,Correct Answer:- A

Explanation:- Plant A manufactures 0.6 × 6250 = 3750 units, plant B manufactures 0.75 × 8500 = 6375 units, plant C manufactures 0.635 × 8000 = 5080 units, plant D manufactures 0.74 × 8750 = 6475 units and plant E manufactures 0.72 × 6000 = 4320 units. These four plants together manufacture a total of 26,000 units. Since this is 40% of the total production capacity of all 10 plants, we know that the total production capacity is 26000/0.4 = 65,000, of which plants A to E account for 37,500 and plants F to J account for 27,500.
The production capacity of plant G is 0.52 × 6250 = 3,250 units. So, the total production capacity of plants F, H, I and J is 27500 – 3250 = 24,250 units. Suppose the production capacities of plants I and J are x units each, so that the production capacities of plants F and H are 2x and 0.85x respectively. Then, 2x + 0.85x + x + x = 24250, which on solving yields x = 5000. So, the production capacity of plant F is 10,000, that of plant H is 4250, and those of plants I and J are 5,000 each.
Since the overall operating efficiency of the 10 plants is 70.33%, the total number of units manufactured is 0.7033 × 65000 = 45715, of which 26,000 units are manufactured by plants A to E and the remaining 19,715 units are manufactured by plants F to J. The number of units manufactured by plant G is 0.72 × 3250 = 2340, that by plant H is 0.7 × 4250 = 2975 and that by plant I is 0.7 × 5000 = 3500. Suppose plant J manufactures y units so that plant F manufactures y + 3600 units. Then, 2340 + 2975 + 3500 + y + y + 3600 = 19715, which on solving yields y = 3650, so that plant J manufactures 3650 units and plant F manufactures 7250 units. Using these values, we can calculate the operating efficiencies of plants F to J.
All of this information, we can tabulate the production capacity, Operating efficiency and production of the 10 plants as shown below.

	Production Capacity	**Operating Efficiency**	**Production**
A	6250	60.00%	3750
B	8500	75.00%	6375
C	8000	63.50%	5080
D	8750	74.00%	6475
E	6000	72.00%	4320
F	10000	72.50%	7250
G	3250	72.00%	2340
H	4250	70.00%	2975
I	5000	70.00%	3500
J	5000	73.00%	3650

 Plants A to E have a total production capacity of 37,500 units while the number of units manufactured is 26,000. Thus the operating efficiency of plants A to E is (26000/37500) × 100 = 69.33%.

QNo:- 40 ,Correct Answer:- A

Explanation:- Plant A manufactures 0.6 × 6250 = 3750 units, plant B manufactures 0.75 × 8500 = 6375 units, plant C manufactures 0.635 × 8000 = 5080 units, plant D manufactures 0.74 × 8750 = 6475 units and plant E manufactures 0.72 × 6000 = 4320 units. These four plants together manufacture a total of 26,000 units. Since this is 40% of the total production capacity of all 10 plants, we know that the total production capacity is 26000/0.4 = 65,000, of which plants A to E account for 37,500 and plants F to J account for 27,500.
The production capacity of plant G is 0.52 × 6250 = 3,250 units. So, the total production capacity of plants F, H, I and J is 27500 – 3250 = 24,250 units. Suppose the production capacities of plants I and J are x units each, so that the production capacities of plants F and H are 2x and 0.85x respectively. Then, 2x + 0.85x + x + x = 24250, which on solving yields x = 5000. So, the production capacity of plant F is 10,000, that of plant H is 4250, and those of plants I and J are 5,000 each.
Since the overall operating efficiency of the 10 plants is 70.33%, the total number of units manufactured is 0.7033 × 65000 = 45715, of which 26,000 units are manufactured by plants A to E and the remaining 19,715 units are manufactured by plants F to J. The number of units manufactured by plant G is 0.72 × 3250 = 2340, that by plant H is 0.7 × 4250 = 2975 and that by plant I is 0.7 × 5000 = 3500. Suppose plant J manufactures y units so that plant F manufactures y + 3600 units. Then, 2340 + 2975 + 3500 + y + y + 3600 = 19715, which on solving yields y = 3650, so that plant J manufactures 3650 units and plant F manufactures 7250 units. Using these values, we can calculate the operating efficiencies of plants F to J.

All of this information, we can tabulate the production capacity, Operating efficiency and production of the 10 plants as shown below.

	Production Capacity	Operating Efficiency	Production
A	6250	60.00%	3750
B	8500	75.00%	6375
C	8000	63.50%	5080
D	8750	74.00%	6475
E	6000	72.00%	4320
F	10000	72.50%	7250
G	3250	72.00%	2340
H	4250	70.00%	2975
I	5000	70.00%	3500
J	5000	73.00%	3650

Plants F to J have a total production capacity of 27,500 units while the number of units manufactured is 19,715. Thus the operating efficiency of plants A to E is (19715/27500) × 100 = 71.69%.

QNo:- 41 ,Correct Answer:- *A*

Explanation:- *Plant A manufactures 0.6 × 6250 = 3750 units, plant B manufactures 0.75 × 8500 = 6375 units, plant C manufactures 0.635 × 8000 = 5080 units, plant D manufactures 0.74 × 8750 = 6475 units and plant E manufactures 0.72 × 6000 = 4320 units. These four plants together manufacture a total of 26,000 units. Since this is 40% of the total production capacity of all 10 plants, we know that the total production capacity is 26000/0.4 = 65,000, of which plants A to E account for 37,500 and plants F to J account for 27,500.*
The production capacity of plant G is 0.52 × 6250 = 3,250 units. So, the total production capacity of plants F, H, I and J is 27500 – 3250 = 24,250 units. Suppose the production capacities of plants I and J are x units each, so that the production capacities of plants F and H are 2x and 0.85x respectively. Then, 2x + 0.85x + x + x = 24250, which on solving yields x = 5000. So, the production capacity of plant F is 10,000, that of plant H is 4250, and those of plants I and J are 5,000 each.
Since the overall operating efficiency of the 10 plants is 70.33%, the total number of units manufactured is 0.7033 × 65000 = 45715, of which 26,000 units are manufactured by plants A to E and the remaining 19,715 units are manufactured by plants F to J. The number of units manufactured by plant G is 0.72 × 3250 = 2340, that by plant H is 0.7 × 4250 = 2975 and that by plant I is 0.7 × 5000 = 3500. Suppose plant J manufactures y units so that plant F manufactures y + 3600 units. Then, 2340 + 2975 + 3500 + y + y + 3600 = 19715, which on solving yields y = 3650, so that plant J manufactures 3650 units and plant F manufactures 7250 units. Using these values, we can calculate the operating efficiencies of plants F to J.
All of this information, we can tabulate the production capacity, Operating efficiency and production of the 10 plants as shown below.

	Production Capacity	Operating Efficiency	Production
A	6250	60.00%	3750
B	8500	75.00%	6375
C	8000	63.50%	5080
D	8750	74.00%	6475
E	6000	72.00%	4320
F	10000	72.50%	7250
G	3250	72.00%	2340
H	4250	70.00%	2975
I	5000	70.00%	3500
J	5000	73.00%	3650

The top 5 plants according to production capacity are F(10000), D(8750), B(8500), C(8000) and A(6250), and the number of units manufactured by these plants are 7250, 6475, 6375, 5080 and 3750 respectively. The total production capacity of these 5 plants is 41500 units and the total number of units manufactured by them is 28930. Thus the efficiency is (28930/41500) × 100 = 69.71%.

QNo:- 42 ,Correct Answer:- A

Explanation:- Plant A manufactures 0.6 × 6250 = 3750 units, plant B manufactures 0.75 × 8500 = 6375 units, plant C manufactures 0.635 × 8000 = 5080 units, plant D manufactures 0.74 × 8750 = 6475 units and plant E manufactures 0.72 × 6000 = 4320 units. These four plants together manufacture a total of 26,000 units. Since this is 40% of the total production capacity of all 10 plants, we know that the total production capacity is 26000/0.4 = 65,000, of which plants A to E account for 37,500 and plants F to J account for 27,500.
The production capacity of plant G is 0.52 × 6250 = 3,250 units. So, the total production capacity of plants F, H, I and J is 27500 – 3250 = 24,250 units. Suppose the production capacities of plants I and J are x units each, so that the production capacities of plants F and H are 2x and 0.85x respectively. Then, 2x + 0.85x + x + x = 24250, which on solving yields x = 5000. So, the production capacity of plant F is 10,000, that of plant H is 4250, and those of plants I and J are 5,000 each.
Since the overall operating efficiency of the 10 plants is 70.33%, the total number of units manufactured is 0.7033 × 65000 = 45715, of which 26,000 units are manufactured by plants A to E and the remaining 19,715 units are manufactured by plants F to J. The number of units manufactured by plant G is 0.72 × 3250 = 2340, that by plant H is 0.7 × 4250 = 2975 and that by plant I is 0.7 × 5000 = 3500. Suppose plant J manufactures y units so that plant F manufactures y + 3600 units. Then, 2340 + 2975 + 3500 + y + y + 3600 = 19715, which on solving yields y = 3650, so that plant J manufactures 3650 units and plant F manufactures 7250 units. Using these values, we can calculate the operating efficiencies of plants F to J.
All of this information, we can tabulate the production capacity, Operating efficiency and production of the 10 plants as shown below.

	Production Capacity	Operating Efficiency	Production
A	6250	60.00%	3750
B	8500	75.00%	6375
C	8000	63.50%	5080
D	8750	74.00%	6475
E	6000	72.00%	4320
F	10000	72.50%	7250
G	3250	72.00%	2340
H	4250	70.00%	2975
I	5000	70.00%	3500
J	5000	73.00%	3650

The top 5 plants according to the number of units manufactured are F(7250), D(6475), B(6375), C(5080) and E(4320). The total number of units manufactured by these 5 plants is 29500 and the total production capacity of these plants is 41250. Thus the efficiency is (29500/41250) × 100 = 71.5151% ≡ 71.52%.

QNo:- 43 ,Correct Answer:- 20

Explanation:- Let the number of copies of the Daily Overview, the Daily News and the Daily Post delivered on Wednesday are x, y and y respectively. The number of copies of the Daily Overview delivered on Thursday, Friday and Saturday are x each. Suppose the number of copies of the Daily News delivered on Thursday, Friday and Saturday are (y – z), (y – 2z) and (y – 3z) respectively and the number of copies of the Daily Post delivered on Thursday, Friday and Saturday are 3y/2, 9y/4 and 27y/8 respectively.
The total number of newspapers delivered on Wednesday is x + 2y = 68.
The total number of newspapers delivered on Thursday is x + (y – z) + (3y/2) = 76 or 2x + 5y – 2z = 152.
The total number of newspapers delivered on Friday is x + (y – 2z) + (9y/4) = 90 or 4x + 13y – 8z = 360.
The total number of newspapers delivered on Saturday is x + (y – 3z) + (27y/8) = 113 or 8x + 35y – 24z = 904.
Consider Thursday – 2(Wednesday) = 2x + 5y – 2z – (2x + 4y) = y – 2z = 152 – 136 = 16.

Consider Friday – 2(Thursday) = 4x + 13y – 8z – (4x + 10y – 4z) = 3y – 4z = 360 – 304 = 56.
Now, 3y – 4z = 56 can be rewritten as 3y – 6z + 2z = 56. Substituting y – 2z = 16, we get 48 + 2z = 56 or z = 4. So, y – 8 = 16 yields y = 24, so that x + 48 = 68 yields x = 20. We can now tabulate the number of copies of each newspaper delivered on each of the days as shown below.

	Wednesday	Thursday	Friday	Saturday	Total
Daily Overview	20	20	20	20	80
Daily News	24	20	16	12	72
Daily Post	24	36	54	81	195
Total	68	76	90	113	347

20 copies of the Daily Overview were delivered each day.

QNo:- 44 ,Correct Answer:- 12

Explanation:- Let the number of copies of the Daily Overview, the Daily News and the Daily Post delivered on Wednesday are x, y and y respectively. The number of copies of the Daily Overview delivered on Thursday, Friday and Saturday are x each. Suppose the number of copies of the Daily News delivered on Thursday, Friday and Saturday are (y – z), (y – 2z) and (y – 3z) respectively and the number of copies of the Daily Post delivered on Thursday, Friday and Saturday are 3y/2, 9y/4 and 27y/8 respectively.
The total number of newspapers delivered on Wednesday is x + 2y = 68.
The total number of newspapers delivered on Thursday is x + (y – z) + (3y/2) = 76 or 2x + 5y – 2z = 152.
The total number of newspapers delivered on Friday is x + (y – 2z) + (9y/4) = 90 or 4x + 13y – 8z = 360.
The total number of newspapers delivered on Saturday is x + (y – 3z) + (27y/8) = 113 or 8x + 35y – 24z = 904.
Consider Thursday – 2(Wednesday) = 2x + 5y – 2z – (2x + 4y) = y – 2z = 152 – 136 = 16.
Consider Friday – 2(Thursday) = 4x + 13y – 8z – (4x + 10y – 4z) = 3y – 4z = 360 – 304 = 56.
Now, 3y – 4z = 56 can be rewritten as 3y – 6z + 2z = 56. Substituting y – 2z = 16, we get 48 + 2z = 56 or z = 4. So, y – 8 = 16 yields y = 24, so that x + 48 = 68 yields x = 20. We can now tabulate the number of copies of each newspaper delivered on each of the days as shown below.

	Wednesday	Thursday	Friday	Saturday	Total
Daily Overview	20	20	20	20	80
Daily News	24	20	16	12	72
Daily Post	24	36	54	81	195
Total	68	76	90	113	347

12 copies of the Daily News were delivered on Saturday.

QNo:- 45 ,Correct Answer:- 81

Explanation:- Let the number of copies of the Daily Overview, the Daily News and the Daily Post delivered on Wednesday are x, y and y respectively. The number of copies of the Daily Overview delivered on Thursday, Friday and Saturday are x each. Suppose the number of copies of the Daily News delivered on Thursday, Friday and Saturday are (y – z), (y – 2z) and (y – 3z) respectively and the number of copies of the Daily Post delivered on Thursday, Friday and Saturday are 3y/2, 9y/4 and 27y/8 respectively.
The total number of newspapers delivered on Wednesday is x + 2y = 68.
The total number of newspapers delivered on Thursday is x + (y – z) + (3y/2) = 76 or 2x + 5y – 2z = 152.
The total number of newspapers delivered on Friday is x + (y – 2z) + (9y/4) = 90 or 4x + 13y – 8z = 360.
The total number of newspapers delivered on Saturday is x + (y – 3z) + (27y/8) = 113 or 8x + 35y – 24z = 904.
Consider Thursday – 2(Wednesday) = 2x + 5y – 2z – (2x + 4y) = y – 2z = 152 – 136 = 16.
Consider Friday – 2(Thursday) = 4x + 13y – 8z – (4x + 10y – 4z) = 3y – 4z = 360 – 304 = 56.
Now, 3y – 4z = 56 can be rewritten as 3y – 6z + 2z = 56. Substituting y – 2z = 16, we get 48 + 2z = 56 or z = 4. So, y – 8 = 16 yields y = 24, so that x + 48 = 68 yields x = 20. We can now tabulate the number of copies of each newspaper delivered on each of the days as shown below.

	Wednesday	Thursday	Friday	Saturday	Total
Daily Overview	20	20	20	20	80

Daily News	24	20	16	12	**72**
Daily Post	24	36	54	81	**195**
Total	**68**	**76**	**90**	**113**	**347**

81 copies of the Daily Post were delivered on Saturday.

QNo:- 46 ,Correct Answer:- 123

Explanation:- *Let the number of copies of the Daily Overview, the Daily News and the Daily Post delivered on Wednesday are x, y and y respectively. The number of copies of the Daily Overview delivered on Thursday, Friday and Saturday are x each. Suppose the number of copies of the Daily News delivered on Thursday, Friday and Saturday are (y – z), (y – 2z) and (y – 3z) respectively and the number of copies of the Daily Post delivered on Thursday, Friday and Saturday are 3y/2, 9y/4 and 27y/8 respectively.*
The total number of newspapers delivered on Wednesday is x + 2y = 68.
The total number of newspapers delivered on Thursday is x + (y – z) + (3y/2) = 76 or 2x + 5y – 2z = 152.
The total number of newspapers delivered on Friday is x + (y – 2z) + (9y/4) = 90 or 4x + 13y – 8z = 360.
The total number of newspapers delivered on Saturday is x + (y – 3z) + (27y/8) = 113 or 8x + 35y – 24z = 904.
Consider Thursday – 2(Wednesday) = 2x + 5y – 2z – (2x + 4y) = y – 2z = 152 – 136 = 16.
Consider Friday – 2(Thursday) = 4x + 13y – 8z – (4x + 10y – 4z) = 3y – 4z = 360 – 304 = 56.
Now, 3y – 4z = 56 can be rewritten as 3y – 6z + 2z = 56. Substituting y – 2z = 16, we get 48 + 2z = 56 or z = 4. So, y – 8 = 16 yields y = 24, so that x + 48 = 68 yields x = 20. We can now tabulate the number of copies of each newspaper delivered on each of the days as shown below.

	Wednesday	Thursday	Friday	Saturday	Total
Daily Overview	20	20	20	20	**80**
Daily News	24	20	16	12	**72**
Daily Post	24	36	54	81	**195**
Total	**68**	**76**	**90**	**113**	**347**

The total number of copies of the Daily Post and the Daily News delivered over the 4-day period is 195 and 72 respectively. The required difference is 195 – 72 = 123.

QNo:- 47 ,Correct Answer:- C

Explanation:- *From the line graph, we know that 1413157 foreigners visited India in Quarter 1 of 2009. From the table, we know that the number of foreigners visiting India in Quarter 1 of 2009 was 11.85% less than the number of foreigners visiting India in Quarter 1 of 2008. Thus, the number of foreigners visiting India in Quarter 1 of 2008 was 1413157/0.8815 = 1603127.*

QNo:- 48 ,Correct Answer:- C

Explanation:- *From the line graph, we know that 1616148 foreigners visited India in Quarter 4 of 2009. From the table, we know that the number of foreigners visiting India in Quarter 4 of 2009 was 6.63% more than the number of foreigners visiting India in Quarter 4 of 2008. So, the number of foreigners visiting India in Quarter 4 of 2008 was 1616148/1.0663 = 1515660. From the line graph, we know that 2153599 foreigners visited India in Quarter 4 of 2013. From the table, we know that the number of foreigners visiting India in Quarter 4 of 2014 was 6.01% more than the number of foreigners visiting India in Quarter 4 of 2013. So, the number of foreigners visiting India in Quarter 4 of 2014 was 2153599 × 1.0601 = 2283030. The required difference is 2283030 – 1515660 = 767370.*

QNo:- 49 ,Correct Answer:- C

Explanation:-
This question involves too many calculations and could be avoided. Values for the four quarters of 2009, 2011 and 2013 are readily available from the line graph. We need to calculate values for the four quarters in 2010 and 2012. From the table, we

know that the number of foreigners visiting India in Quarter 1 of 2010 was 15.56% more than the number of foreigners visiting India in Quarter 1 of 2009. So, the number of foreigners visiting India in Quarter 1 of 2010 was 1413157 × 1.1556 ≈ 1633050. We can calculate the number of foreigners visiting India in all quarters of 2010 and 2012 in a similar manner.

The number of foreigners visiting India in Quarter 2 of 2010 was 905080 × 1.2027 ≈ 1088550.
The number of foreigners visiting India in Quarter 3 of 2010 was 1133314 × 1.1106 ≈ 1258650.
The number of foreigners visiting India in Quarter 4 of 2010 was 1616148 × 1.1108 ≈ 1795200.
The number of foreigners visiting India in Quarter 1 of 2012 was 1809463 × 1.0880 ≈ 1968700.
The number of foreigners visiting India in Quarter 2 of 2012 was 1205461 × 1.0415 ≈ 1255500.
The number of foreigners visiting India in Quarter 3 of 2012 was 1360396 × 0.9872 ≈ 1343000.
The number of foreigners visiting India in Quarter 4 of 2012 was 1914999 × 1.0499 ≈ 2010600.

The total number of foreigners visiting India in 2009 was 1413157 + 905080 + 1133314 + 1616148 = 5067599 = 50.67 lakhs.
The total number of foreigners visiting India in 2010 was 1633050 + 1088550 + 1258650 + 1795200 = 5775450 = 57.75 lakhs.
The total number of foreigners visiting India in 2011 was 1809463 + 1205461 + 1360396 + 1914999 = 6290319 = 62.9 lakhs.
The total number of foreigners visiting India in 2012 was 1968700 + 1255500 + 1343000 + 2010600 = 6577800 = 65.77 lakhs.
The total number of foreigners visiting India in 2013 was 2048420 + 1409256 + 1446326 + 2153599 = 7057601 = 70.57 lakhs.
Thus the total number of foreigners visiting India in the four quarter of a year has exceeded 60 lakhs in three years.

QNo:- 50 ,Correct Answer:- C

Explanation:- *From the line graph, we know that 1413157 foreigners visited India in Quarter 1 of 2009. From the table we know that the number of foreigners visiting India in Quarter 1 of 2009 was 11.85% less than the number of foreigners visiting India in Quarter 1 of 2008. So, the number of foreigners visiting India in Quarter 1 of 2008 was 1413157/0.8815 = 1603130. We can calculate the number of foreigners visiting India in the four quarters of 2008 and 2014 in a similar manner.*
The number of foreigners visiting India in Quarter 2 of 2008 was 905080/0.8988 = 1006990.
The number of foreigners visiting India in Quarter 3 of 2008 was 1133314/0.9796 = 1156920.
The number of foreigners visiting India in Quarter 4 of 2008 was 1616148/1.0663 = 1515660.
The total number of foreigners visiting India in 2008 was 1603130 + 1006990 + 1156920 + 1515660 = 5282700.
The number of foreigners visiting India in Quarter 1 of 2014 was 2048420 × 1.0382 = 2126670.
The number of foreigners visiting India in Quarter 2 of 2014 was 1409256 × 1.0055 = 1417000.
The number of foreigners visiting India in Quarter 3 of 2014 was 1446326 × 1.1 = 1590960.
The number of foreigners visiting India in Quarter 4 of 2014 was 2153599 × 1.0601 = 2283030.
The total number of foreigners visiting India in 2010 was 2126670 + 1417000 + 1590960 + 2283030 = 7417660.
Thus, 7417660 – 5282700 = 2134960 = 21.34 lakhs more foreigners visited India in the four quarters of 2014 than 2008.

QNo:- 51 ,Correct Answer:- B

Explanation:-
Since A, B, C and D are single digits and prime numbers, the only possible values are 2, 3, 5 or 7.
Since C × D yields an answer with the unit's digit C, the only possibility is C = 5 and D is an odd number.
Since C = 5, D can only be 3 or 7.

Suppose D = 7.
Then, C × D = 5 × 7 = 35, so there is a carry over of 3.
Now, (D × A) + 3 should yield an answer ending in B.
Since C = 5 and D = 7, B can only take values 2 or 3.
So, (D × A) + 3 = (7 × A) + 3 should yield an answer ending in 2 or 3.

In other words, (7 × A) should yield an answer ending in –1 or 0.
Both these cases are not possible.
So, D cannot be 7 and therefore D = 3.

If D = 3, then D × C = 3 × 5 = 15

⇒ *there is a carry over of 1.*

Now, (D × A) + 1 should yield an answer ending in B.
Since C = 5 and D = 3, B can only take values 2 or 7.
So, (D × A) + 1 = (3 × A) + 1 should yield an answer ending in 2 or 7.
In other words, (3 × A) should yield an answer ending in 1 or 6.

Now, if A = 7, then B = 2 and if A = 2, then B = 7.
Suppose A = 2 and B = 7.
Then, (AAC) × D = 225 × 3 = 675.
Since this answer should have been a 4-digit integer, we know that A cannot be 2 and B cannot be 7.
So, A = 7 and B = 2.
Thus, the values of the letters are A = 7, B = 2, C = 5 and D = 3.

D × (BAC) = 3 × 275 = 825.
In option 1, (BC) × (A × C) + (BC) = 25 × (7 × 5) + 25 = 900.
In option 2, (AC) × (B × C) + (AC) = 75 × (2 × 5) + 75 = 825.
Thus the answer is option 2.

QNo:- 52 ,Correct Answer:- A

Explanation:-
Since A, B, C and D are digits and prime numbers, the only possible values are 2, 3, 5 or 7.
Since C × D yields an answer with the unit's digit C, the only possibility is C = 5 and D is an odd number.
Since C = 5, D can only be 3 or 7.

Suppose D = 7.
Then, C × D = 5 × 7 = 35, so there is a carry over of 3.
Now, (D × A) + 3 should yield an answer ending in B.
Since C = 5 and D = 7, B can only take values 2 or 3.
So, (D × A) + 3 = (7 × A) + 3 should yield an answer ending in 2 or 3.

In other words, (7 × A) should yield an answer ending in –1 or 0.
Both these cases are not possible.
So, D cannot be 7 and therefore D = 3.

If D = 3, then D × C = 3 × 5 = 15

⇒ *there is a carry over of 1.*

Now, (D × A) + 1 should yield an answer ending in B.
Since C = 5 and D = 3, B can only take values 2 or 7.
So, (D × A) + 1 = (3 × A) + 1 should yield an answer ending in 2 or 7.
In other words, (3 × A) should yield an answer ending in 1 or 6.

Now, if A = 7, then B = 2 and if A = 2, then B = 7.
Suppose A = 2 and B = 7.
Then, (AAC) × D = 225 × 3 = 675.
Since this answer should have been a 4-digit integer, we know that A cannot be 2 and B cannot be 7.
So, A = 7 and B = 2.
Thus, the values of the letters are A = 7, B = 2, C = 5 and D = 3.

$(BDD)^2 - (A × D × B)^2$

= $(233)^2 - (7 \times 3 \times 2)^2$
= $233^2 - 42^2$
= $54289 - 1764$
= 52525
= $(CBCBC)$.

QNo:- 53 ,Correct Answer:- C

Explanation:-
Since A, B, C and D are digits and prime numbers, the only possible values are 2, 3, 5 or 7.
Since C × D yields an answer with the unit's digit C, the only possibility is C = 5 and D is an odd number.
Since C = 5, D can only be 3 or 7.

Suppose D = 7.
Then, C × D = 5 × 7 = 35, so there is a carry over of 3.
Now, (D × A) + 3 should yield an answer ending in B.
Since C = 5 and D = 7, B can only take values 2 or 3.
So, (D × A) + 3 = (7 × A) + 3 should yield an answer ending in 2 or 3.

In other words, (7 × A) should yield an answer ending in –1 or 0.
Both these cases are not possible.
So, D cannot be 7 and therefore D = 3.

If D = 3, then D × C = 3 × 5 = 15

⇒ there is a carry over of 1.

Now, (D × A) + 1 should yield an answer ending in B.
Since C = 5 and D = 3, B can only take values 2 or 7.
So, (D × A) + 1 = (3 × A) + 1 should yield an answer ending in 2 or 7.
In other words, (3 × A) should yield an answer ending in 1 or 6.

Now, if A = 7, then B = 2 and if A = 2, then B = 7.
Suppose A = 2 and B = 7.
Then, (AAC) × D = 225 × 3 = 675.
Since this answer should have been a 4-digit integer, we know that A cannot be 2 and B cannot be 7.
So, A = 7 and B = 2.
Thus, the values of the letters are A = 7, B = 2, C = 5 and D = 3.

A + B + C + D = 7 + 2 + 5 + 3 = 17.
Substituting for the letters, options 1, 2 and 4 yield 17 while option 3 yields 18.
The correct answer is option 3.

QNo:- 54 ,Correct Answer:- A

Explanation:-
Since A, B, C and D are digits and prime numbers, the only possible values are 2, 3, 5 or 7.
Since C × D yields an answer with the unit's digit C, the only possibility is C = 5 and D is an odd number.
Since C = 5, D can only be 3 or 7.

Suppose D = 7.
Then, C × D = 5 × 7 = 35, so there is a carry over of 3.

Now, (D × A) + 3 should yield an answer ending in B.
Since C = 5 and D = 7, B can only take values 2 or 3.
So, (D × A) + 3 = (7 × A) + 3 should yield an answer ending in 2 or 3.

In other words, (7 × A) should yield an answer ending in –1 or 0.
Both these cases are not possible.
So, D cannot be 7 and therefore D = 3.

If D = 3, then D × C = 3 × 5 = 15

⇒ there is a carry over of 1.

Now, (D × A) + 1 should yield an answer ending in B.
Since C = 5 and D = 3, B can only take values 2 or 7.
So, (D × A) + 1 = (3 × A) + 1 should yield an answer ending in 2 or 7.
In other words, (3 × A) should yield an answer ending in 1 or 6.

Now, if A = 7, then B = 2 and if A = 2, then B = 7.
Suppose A = 2 and B = 7.
Then, (AAC) × D = 225 × 3 = 675.
Since this answer should have been a 4-digit integer, we know that A cannot be 2 and B cannot be 7.
So, A = 7 and B = 2.
Thus, the values of the letters are A = 7, B = 2, C = 5 and D = 3.

(AAC) × (DD) = BCCAC = 25575.

QNo:- 55 ,Correct Answer:- C

Explanation:- *We can tabulate the given information as shown below.*

Family	P1	P2	P3	P4	P5
L	A	A, B	---	---	B
M	C, D	D, G	D	C, G	E
N	H	---	H, S	R	R, S

Since children from each family working on a project have at least one laptop, we can conclude that a single child from any family working on a project must have a laptop.
Of the Lalwanis, Anay alone works on P1 and Bhairavi alone works on P5; therefore, both of them must have laptops.
Of the Mangwanis, Divya alone works on P3 and Esha alone works on P5; therefore, both of them must have laptops. Now, Chetan and Gautam need not have laptops for P1 and P2 respectively, but at least one of them must have a laptop for P4.
Of the Nagranis, Hetal alone works on P1 and Rohit alone works on P4; therefore, both of them must have laptops.

Two children, one of Chetan and Gautam, and Sohum need not have laptops.

QNo:- 56 ,Correct Answer:- D

Explanation:- *We can tabulate the given information as shown below.*

Family	P1	P2	P3	P4	P5
L	A	A, B	---	---	B
M	C, D	D, G	D	C, G	E

| N | H | --- | H, S | R | R, S |

Since children from each family working on a project have at least one laptop, we can conclude that a single child from any family working on a project must have a laptop.
Of the Lalwanis, Anay alone works on P1 and Bhairavi alone works on P5; therefore, both of them must have laptops.
Of the Mangwanis, Divya alone works on P3 and Esha alone works on P5; therefore, both of them must have laptops. Now, Chetan and Gautam need not have laptops for P1 and P2 respectively, but at least one of them must have a laptop for P4.
Of the Nagranis, Hetal alone works on P1 and Rohit alone works on P4; therefore, both of them must have laptops.

Sohum need not have a laptop for any project.

QNo:- 57 ,Correct Answer:- C

Explanation:- We can tabulate the given information as shown below.

Family	P1	P2	P3	P4	P5
L	A	A, B	---	---	B
M	C, D	D, G	D	C, G	E
N	H	---	H, S	R	R, S

Since children from each family working on a project have at least one laptop, we can conclude that a single child from any family working on a project must have a laptop.
Of the Lalwanis, Anay alone works on P1 and Bhairavi alone works on P5; therefore, both of them must have laptops.
Of the Mangwanis, Divya alone works on P3 and Esha alone works on P5; therefore, both of them must have laptops. Now, Chetan and Gautam need not have laptops for P1 and P2 respectively, but at least one of them must have a laptop for P4.
Of the Nagranis, Hetal alone works on P1 and Rohit alone works on P4; therefore, both of them must have laptops.

P3 will have exactly 2 laptops, one each with Divya and Hetal, while Sohum need not have a laptop. P4 will have exactly 2 laptops, one with either Chetan or Gautam, and one with Rohit. Thus, two projects will have exactly two laptops.

QNo:- 58 ,Correct Answer:- B

Explanation:- We can tabulate the given information as shown below.

Family	P1	P2	P3	P4	P5
L	A	A, B	---	---	B
M	C, D	D, G	D	C, G	E
N	H	---	H, S	R	R, S

Since children from each family working on a project have at least one laptop, we can conclude that a single child from any family working on a project must have a laptop.
Of the Lalwanis, Anay alone works on P1 and Bhairavi alone works on P5; therefore, both of them must have laptops.
Of the Mangwanis, Divya alone works on P3 and Esha alone works on P5; therefore, both of them must have laptops. Now, Chetan and Gautam need not have laptops for P1 and P2 respectively, but at least one of them must have a laptop for P4.
Of the Nagranis, Hetal alone works on P1 and Rohit alone works on P4; therefore, both of them must have laptops.
P1 has 3 laptops, one each with Anay, Divya and Hetal. P2 has 3 laptops, one each with Anay, Bhairavi and Divya. We know that at least one of Chetan and Gautam must have a laptop for P4. Since we want to minimise the total number of laptops, exactly one of them must have a laptop. Accordingly, either P1 only or P2 only will have exactly 4 laptops.

QNo:- 59 ,Correct Answer:- 1204

Explanation:- *The longest diagonal starting at cube numbered 1 will end at cube numbered 343. The cubes in the first row of the second layer are numbered 50 through 56, second row are numbered 57 through 63 and so on. After passing through cube numbered 1, the diagonal will pass through the second cube in the second row of the second layer, i.e., cube numbered 58. This pattern of next layer, next row, next cube will continue till cube numbered 343. It is obvious that the numbers on the seven cubes will form an AP as 1, 58, ..., 343. This AP has first term 1, common difference (58 – 1) = 57. So the sum of these seven values will be*

$$\frac{7}{2}\left[2\times1+(7-1)\times57\right]=1204.$$

QNo:- 60 ,Correct Answer:- 1204

Explanation:- *The longest diagonal starting at cube numbered 49 will end at cube numbered 295. The cubes in the seventh row of the first layer are numbered 43 through 49. The cubes in the sixth row of the second layer are numbered 85 through 91. After passing through cube numbered 49, the diagonal will pass through the sixth cube in the sixth row of the second layer, i.e., cube numbered 90. This pattern of next layer, previous row, previous cube will continue till cube numbered 295. It is obvious that the numbers on the seven cubes will form an AP as 49, 90, 131, ..., 295. This AP has first term 49, common difference (90 – 49) = 41. So the sum of these seven values will be*

$$\frac{7}{2}\left[2\times49+(7-1)\times41\right]=1204.$$

QNo:- 61 ,Correct Answer:- 1225

Explanation:- *The face containing the cubes numbered 7 and 343 has cubes numbered 7, 14, 21, ..., 343. From layer 1 to 7, the diagonal will pass through the first, second, ..., seventh cube respectively. The numbers on the cubes will be 7, 63, 119 and so on. These seven numbers form an AP with first term 7 and common difference (63 – 7) = 56. So the sum of these seven values will be*

$$\frac{7}{2}\left[2\times7+(7-1)\times56\right]=1225.$$

QNo:- 62 ,Correct Answer:- 1351

Explanation:- *The face containing the cubes numbered 49 and 337 has cubes numbered 49, 98, 147, ..., 337. From layer 1 to 7, the diagonal will pass through the first, second, ..., seventh cube respectively. The numbers on the cubes will be 49, 97, 145 and so on. These seven numbers form an AP with first term 49 and common difference (97 – 49) = 48. So the sum of these seven values will be*

$$\frac{7}{2}\left[2\times49+(7-1)\times48\right]=1351.$$

QNo:- 63 ,Correct Answer:- B

Explanation:- *The four students have solved 1, 2, 3 and 4 puzzles correctly, in some order and the corresponding points would be 10, 20, 30 and 40. The additional points for time saved by A, B, C and D are 24, 10, 2 and 0 respectively. We need to combine these additional points with the basic points so that the top two totals differ by 12 and the bottom two totals are equal. With a little bit of trial and error, we can match the ranks of the students with their point as shown below.*

Rank	Student	Basic Points	Addnl. Points	Total
1	A	30	24	54
2	C	40	2	42
3	D	20	0	20
4	B	10	10	20

D, who was placed third had solved 2 puzzles correctly.

QNo:- 64 ,Correct Answer:- C

Explanation:-   *The four students have solved 1, 2, 3 and 4 puzzles correctly, in some order and the corresponding points would be 10, 20, 30 and 40. The additional points for time saved by A, B, C and D are 24, 10, 2 and 0 respectively. We need to combine these additional points with the basic points so that the top two totals differ by 12 and the bottom two totals are equal. With a little bit of trial and error, we can match the ranks of the students with their point as shown below.*

Rank	Student	Basic Points	Addnl. Points	Total
1	A	30	24	54
2	C	40	2	42
3	D	20	0	20
4	B	10	10	20

C, who was placed second had solved 4 puzzles correctly.

QNo:- 65 ,Correct Answer:- *B*

Explanation:-   *The four students have solved 1, 2, 3 and 4 puzzles correctly, in some order and the corresponding points would be 10, 20, 30 and 40. The additional points for time saved by A, B, C and D are 24, 10, 2 and 0 respectively. We need to combine these additional points with the basic points so that the top two totals differ by 12 and the bottom two totals are equal. With a little bit of trial and error, we can match the ranks of the students with their point as shown below.*

Rank	Student	Basic Points	Addnl. Points	Total
1	A	30	24	54
2	C	40	2	42
3	D	20	0	20
4	B	10	10	20

B, who was placed fourth had solved only 1 puzzle correctly.

QNo:- 66 ,Correct Answer:- *A*

Explanation:-   *The four students have solved 1, 2, 3 and 4 puzzles correctly, in some order and the corresponding points would be 10, 20, 30 and 40. The additional points for time saved by A, B, C and D are 24, 10, 2 and 0 respectively. We need to combine these additional points with the basic points so that the top two totals differ by 12 and the bottom two totals are equal. With a little bit of trial and error, we can match the ranks of the students with their point as shown below.*

Rank	Student	Basic Points	Addnl. Points	Total
1	A	30	24	54
2	C	40	2	42
3	D	20	0	20
4	B	10	10	20

A, who was placed first had solved 3 puzzles correctly while D, who was placed third had solved 2 puzzles correctly. The required difference is 3 – 2 = 1.

QNo:- 67 ,Correct Answer:- *76*

Explanation:-
Let the age of the wife be x. So man's age is x + 6.
So, (x + 6 – 4)/2 = Married years – 4 and (x + 10) × 2/3 = Married years + 10.

Subtracting the two equations, we get (x + 10) × 2 / 3 − (x + 2) / 2 = 10 + 4.

So, [(2x + 20) × 2 − 3x − 6]/6 = 14 ⇒ x + 34 = 84 ⇒ x = 50.

So, the husband's age is 56. 4 years ago they had been married for 52/2 = 26 years, when he was 52 years old. He will celebrate the golden jubilee of their marriage when he is 26 + 50 = 76 years old.

QNo:- 68 ,Correct Answer:- D

Explanation:- *We prove the result by induction. Let n = 4. If 2 and 4 are not adjacent, then (2, 4) is acceptable. If 2 and 4 are adjacent, then 1 must be between 3 and one of 2 and 4, in which case (2, 3) or (3, 4) is the only acceptable pair.*
Suppose that $n \geq 5$, that the result holds for $n - 1$ numbers and that a configuration of the numbers 1 to n, inclusive is given. The number 1 must lie between two immediate neighbours u and v that are non-adjacent. Thus, the pair (u, v) is acceptable.
Now remove the number 1 and replace each remaining number r by $r_0 = r-1$ to obtain a configuration of n−1 numbers. We show that (r_0, s_0) is acceptable in the latter configuration if and only if (r, s) is acceptable in the given configuration.
If (r_0, s_0) is acceptable, then r_0 and s_0 are not adjacent and there is an arc of smaller numbers between them. The addition of 1 to these numbers and the insertion of 1 will not change either characteristic for (r, s). On the other hand, if (r, s) [1] (u, v) is acceptable in the original configuration , then r and s are not adjacent and each arc connecting them must contain some number other than 1; one of these arcs, at least, contains only numbers less than both r and s. In the final configuration, r_0 and s_0 continue to be non-adjacent and a corresponding arc contains only numbers less than both of them.
By the induction hypothesis, there are $(n - 1) - 3 = n - 4$ acceptable pairs in the latter configuration, and so, with the inclusion of (u, v), there are $(n−4) + 1 = n - 3$ acceptable pairs in the given configuration.

QNo:- 69 ,Correct Answer:- C

Explanation:-
Since 323 = 17 × 19, the only possibility for the expression to hold good is k = m = j
Substituting, we can see that only option 3 is true.

QNo:- 70 ,Correct Answer:- C

Explanation:-
In the following table, every row represents the status of the chairs after every new arrival. Also, P_1, P_2, P_3........ are the persons who sit in the row.
'√' indicates occupied
'_' indicates empty

No. of Chairs occupied	Sr. No. of Chairs							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	√ P1	--	--	--	--	--	--	-- .....
2	√ P1	--	√ P2	--	--	--	--	-- .....
2	√ P1	√ P3	--	--	--	--	--	-- .....
3	√ P1	√ P3	--	√ P4	--	--	--	-- .....
3	√ P1	√ P3	√ P5	--	--	--	--	-- .....

4	√ P_1	√ P_3	√ P_3	--	√ P_6	--	--	--	.....
4	√ P_1	√ P_3	√ P_3	√ P_7	--	--	--	--	.....

In this manner, all chairs except the 55th (i.e. 55 - 1= 54 chairs) can be occupied simultaneously.

QNo:- 71 ,Correct Answer:- 1

Explanation:- Observe the following representations:
$x^8 + x^6 + x^4 + x^2 + 1 = (x^4 + x^3 + x^2 + x + 1)(x^4 - x^3 + x^2 - x + 1)$ .... (1)
and
$x^4 + x^3 + x^2 + x + 1 = (x^2 + 3x + 1)^2 - 5x (x + 1)^2$ ....(2)
When n = 2k is even, we can substitute $x = 5^k$ into equation (1) to get a factorization. When n = 2k −1 is odd, we can substitute $x = 5^{2k-1}$ into equation (2) to get a difference of squares, which can then be factored.

Alternate Method: Induction

QNo:- 72 ,Correct Answer:- B

Explanation:-
Solution: Let the number of cans that the milk merchant purchases be 'c'.
So total quantity of milk = 23c litres.
If he sells milk for Rs. 13 per litre, he gains Rs. 333, CP = SP – gain
=> CP = 23c × 13 – 333 ......(1)
Also, if he sells milk at Rs. 10 per litre, he loses Rs. 150, CP = SP + loss
=> CP = 23c × 10 + 150 ....(2).
Equating equations (1) & (2), we get, 23c × 13 – 333 = 23c × 10 + 150
=> c = 7.
Thus, the number of cans purchased is 7.

QNo:- 73 ,Correct Answer:- 1

Explanation:- $S = 2^{1994} (1 + 2^4 + 2^5 + 2^6 + 2^8 + 2^{n-1994})$
$= 2^{1994}(369 + 2^m)$; where m = n − 1994:
Since 2^{1994} is a square, S is a square if and only if $369 + 2^m$ is a square, $369 + 2^m = b^2$, b an integer.
 If m is odd, say m = 2k + 1, then $369 + 2 . 2^{2k} = b^2$ and $0 - 1 \equiv b^2$ (mod 3), which is impossible. Hence m is even, and we have $369 = (b - 2^{m/2}) (b + 2^{m/2})$; so that each of $(b - 2^{m/2})$ and $(b + 2^{m/2})$ must be a divisor of 369 = 1 × 369 = 3 × 123 = 9 × 41.
There are only three cases:

$b - 2^{m/2} = 1; b + 2^{m/2} = 369 \Rightarrow 2^{m/2} = 184$; not possible;

$b - 2^{m/2} = 3; b + 2^{m/2} = 123 \Rightarrow 2^{m/2} = 60$; not possible;

$b - 2^{m/2} = 9; b + 2^{m/2} = 41 \Rightarrow 2^{m/2} = 16; m = 8:$

Thus m = 8; n = 2002 is the only solution.

QNo:- 74 ,Correct Answer:- B

Explanation:-

Suppose the cost of the article is 100. The merchant gains 40 and sells it for 140. Had he bought is for 20% less, the article would have cost him 80 and he would have sold it for 140 – 20% × 140 = 112 to gain 32. From the given information, 32 ≡ Rs. 224. So, in the earlier case, the merchant would have gained (40 × 224)/32 = Rs. 280.

Hence the answer is option B

QNo:- 75 ,Correct Answer:- 3

Explanation:- LCM (6, 8) = 24; 75/24 = 3 as integer.

QNo:- 76 ,Correct Answer:- 2005056

Explanation:- The smallest integer $N = x^2$ must satisfy:
$2005 \times 10^n \le x^2 < 2006 \times 10^n$
where (n + 4) is the number of digits in the decimal representation of N.
We examine 2 cases "n even" and "n odd"
For n = 2p (even)

$2005 \times 10^{2p} \le x^2 < 2006 \times 10^{2p} \Rightarrow 44,7772.... \times 10^p \le x < 44,7883... \times 10^p$:

The smallest value of p for which x exists is

$p = 2 \Rightarrow x = 4478$ and $N = x^2 = 20052484$

For n = 2p + 1 (odd)

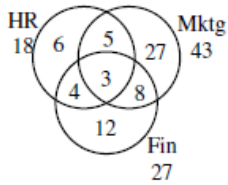$20050 \times 10^{2p} \le x^2 < 20060 \times 10^{2p} \Rightarrow 141,598.... \times 10^p \le x < 141,633.... \times 10^p$:

The smallest value of p for which x exists is $p = 1 \Rightarrow x = 1416$ and $N = x^2 = 2005056$.

Finally the smallest integer is 2005056.

QNo:- 77 ,Correct Answer:- B

Explanation:-
From the given information, we can draw the following Venn diagram.

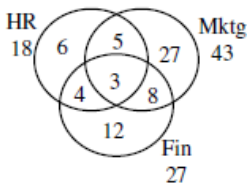The sum of all the values in the Venn diagram is 65 i.e. the number of students who studies atleast 1 subject = 65
So, the remaining 90 − 65 = 25 students are not studying any of the 3 specialisations.
Therefore, the required percentage = (25/90) × 100 = 27.77%.

QNo:- 78 ,Correct Answer:- D

Explanation:-
From the given information, we can draw the following Venn diagram.

The sum of all the values in the Venn diagram is 65 i.e. the number of students who studies atleast 1 subject = 65
So, the remaining 90 − 65 = 25 students are not studying any of the 3 specialisations.
The number of students studying exactly two of the three specialisations is 5 + 4 + 8 = 17.
Thus, the required ratio is 17 : 25.

QNo:- 79 ,Correct Answer:- 2

Explanation:- 2008 = 8 × 251 and 251 is prime. So, by Fermat's Little Theorem ($a^p \equiv a$ mod p, whenever p is prime):
$10^{2008} - 10^8 = 10^{8 \times 251} - 10^8 = (10^8)^{251} - 10^8 \equiv (10^8 - 10^8)$ mod 251 = 0 mod 251
Clearly, $8 | 10^{2008}$ and $8 | 10^8$ and 8 is relatively prime to 251, so 8×251 = $2008 | (10^{2008} - 10^8)$. Here ï stands for 'divides'.

QNo:- 80 ,Correct Answer:- A

Explanation:-
Let's count how many numbers there are from 1 to 222,222,222 that don't have any 00s.
We'll categorize them by how many digits they have:
For n-digit numbers, 9^n of them don't have any 0's. (Each of the n digits can be a number from 1 through 9, so that's 9 choices for each of the n digits.) So, for 1- through 8-digit numbers, there are a total of $9^1 + 9^2 + ... + 9^8 = \{(9^9 - 1)/(9 - 1)\} - 1$ numbers with no 0's.
For 9-digit numbers, we only need to consider the numbers 111,111,111 to 222,222,222.
For these, we further categorize them by how many 2's they have in a row starting from the left (For example, 222217687 starts with four 2's in a row, and 219825675 starts with one 2). Consider all 9-digit numbers that start with exactly k 2's, with $0 \leq k \leq 8$. That means its next digit can't be 2 (since that creates a number with (k + 1) 2's in a row), so the next digit has to be 1. Then, the other (9 − k − 1) digits after that can be any of the numbers 1 through 9, so that gives 9^{9-k-1} choices. This means that there are (9^{9-k-1}) 9-digit numbers that start with k 2's and don't have any 0's.
Since k takes on the values 0 through 8, the total number of these is $9^8 + 9^7 + ... + 9^1 + 9^0$. However, because $0 \leq k \leq 8$, we haven't counted numbers that start with 9 2's. There's only 1 of those, so we simply add 1 to our total, so there are actually $9^8 + 9^7 + ... + 9^1 + 9^0 + 1 = \{(9^9 - 1)/(9 - 1)\} + 1$ nine-digit numbers from 111,111,111 to 222,222,222 with no 0's.
So, our grand total comes to $\{(9^9 - 1)/(9 - 1)\} - 1 + \{(9^9 - 1)/(9 - 1)\} + 1 = (9^9 - 1)/4$
But that's the number of integers WITHOUT 0's, so we need to subtract that from 222,222,222:

$222222222 - (9^9 - 1)/4 = 125367100$

QNo:- 81 ,Correct Answer:- 2

Explanation:- *Method 1. From the options*

Alternate method:
We can prove this proposition by using mathematical induction.
First let's consider the integers that consist of number 1.
When n = 1, we have 3^1 = 3 and the corresponding integer is a_1 = 111. It is obvious that $3|a_1$ since 111 = 3 × 37.
If the proposition is ture for n = k, which means the integer a_k = 111 . . . 111 (3k digits
totally) is divisible by 3k, then the integer a_{k+1} (3k+1 digits totally) can be written as:
$a_{k+1} = (1 + 103k + 102×3k)a_k$
.
Since the integer 1 + 103k + 102×3k has sum of all its digits as 3, it is divisible by 3. Since
we already know that $3k|a_k$, now we have $3k+1|a_{k+1}$.
So the proposition is true for integers that consist of number 1. For integers consisting of other numbers rather than 1, they are just
multiples of the corresponding integers consisting of number 1, so they are divisible by 3n as well.

QNo:- 82 ,Correct Answer:- 3

Explanation:- *The probability is 1/(M + 1). The easiest way to see this is to realize that the K − 1 fish not named George are*
irrelevant to the problem. George survives if and only if all the M gold fish are eaten first. There are M + 1 ways that we can
permute M gold fish and George, giving the solution above.

QNo:- 83 ,Correct Answer:- 3

Explanation:- *It is possible for every third man to get three desserts, and so the maximum number of lucky men is 300/3 = 100.*
But the condition of every third man getting three desserts can be achieved in three distinct ways: (1) the men numbered 1, 4, 7,
10, . . . , 298 each get three desserts, (2) the men numbered 3, 6, 9, 12, . . . , 300 each get three desserts. Since each of these distinct
ways requires every one of the 300 waiters to do something he has a 1 out of 3 chance of doing, each way has a probability of
$1/3^{300}$. But since there are three ways, the probability that 100 men are lucky is $3(1/3^{300}) = 1/3^{299}$.

QNo:- 84 ,Correct Answer:- 11

Explanation:- *Clearly x > y ≥ 1 and $xy + 61 = x^3 - y^3 = (x - y)(x^2 + xy + y^2)$,*
So, $61 = (x - y)(x^2 + y^2) + (x - y - 1) xy$
If x + y ≥ 3, then x ≥ 4 and $61 > 3(x^2 + y^2)$. Thus x = 4, so y = 1 and we note that these do not satisfy the original equation.
If x − y = 2, then
$61 = 2(x^2 + y^2) + xy = 2 \{(y + 2)^2 + y^2\} + (y + 2)y = 5y^2 + 10y + 8$
and this equation also has no positive integer solution in y.
Thus we must have x − y = 1, so $61 = x^2 + y^2 = (y + 2)^2 + y^2$
and hence y = 5 and x = 6.

QNo:- 85 ,Correct Answer:- 2

Explanation:- *Let p_n denote the probability that the last number drawn will be 1 given that the first number drawn is n. Since*
each of the numbers 1 to 4 is equally likely to be drawn, the total probability p that the last number drawn is 1 is: p = (1/4)(p_1 +
$p_2 + p_3 + p_4$).

Choose $2 \le r \le 4$ and assume the first number drawn is r. If the second number drawn is $r \le s \le 4$, then drawing terminates whenever a number less that s is drawn. So the probability that the last number drawn will be 1 is p_s. If the second number drawn is

$2 \le s \le r$, this represents a decrease, and drawing terminates with a last number other than 1, so the probability that the last number drawn will be 1 is 0. Finally, if s = 1, drawing terminates at 1 and the probability that the last number drawn will be 1 is 1. Summarizing, we have the following relations: $p_r = (1/4)(1 + p_r + p_{r+1} + \cdots + p_4)$ for $2 \le r \le 4$. Lastly suppose that 1 is drawn first. This doesn't affect future drawings in any way; it is as if the first drawing were a "pass". So $p4 = p = (1/4)(p_1 + p_2 + p_3 + p_4)$.

Recapping, we have 4 equations:

$p_4 = (1/4)(p_4 + 1)$

$p_3 = (1/4)(p_4 + p_3 + 1)$

$p_2 = (1/4)(p_4 + p_3 + p_2 + 1)$

$p_1 = (1/4)(p_4 + p_3 + p_2 + p_1)$

These are easily solved with the following results:

$p_4 = 1/3$, $p_2 = 4/9$, $p_3 = 16/27$, and $p_1 = p = 37/81$

QNo:- 86 ,Correct Answer:- C

Explanation:- We make use of the fact that an angle inscribed in a circle has measure equal to one-half of the arc subtended. Since the x- and y-axes meet in a right angle, the circle C1 through B;O, and Q has QB as a diameter.

Also, ∠APB is a right angle, since AB is the diameter of C. But this means that ∠QPB and ∠QOB are both right angles, so that P;O;

Q;B all lie on circle C1. Thus the two angles in question, ∠BQP and ∠BOP, are inscribed in C1, subtend the same arc, and are

therefore equal.

QNo:- 87 ,Correct Answer:- D

Explanation:- Let his take n greater than equal to 7.
n equals 1 + (n - 1).
Now 1, n - 1 are always co-prime to each other.
So 4th option is the answer

QNo:- 88 ,Correct Answer:- B
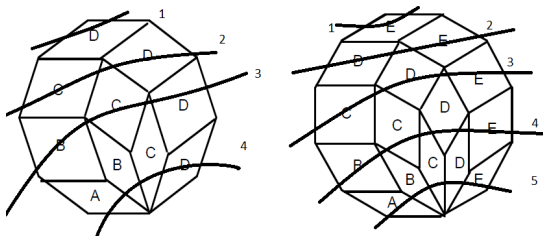
Explanation:-

From the figure, it must be clear that the number of rhombuses will be equal to sum of $(n/2) - 1$ natural numbers for a n-gon. Therefore, for 2002-gon there will be $(1 + 2 + 3 + \ldots + 1000)$ rhombuses
= 500 × 1001

QNo:- 89 ,Correct Answer:- A

Explanation:- (a) If (x,y) is a pair of integers that satisfies the inequality, then (−x,−y) is also such a pair, since $(-x)^2 + (-x)(-y) + (-y)^2 = x^2 + xy + y^2$.

So we can match up pairs of solutions to the inequality, (x,y)↔(−x,−y). Every solution will be paired with a different solution, except for the one remaining solution (0,0) which is paired with itself. This shows that the number of solutions is odd.

QNo:- 90 ,Correct Answer:- B

Explanation:- First note that the numbers in the list are an increasing sequence of Fibonacci numbers, i.e. starting with 5, each number is the sum of the previous two numbers in the list. By the triangle inequality, we know that the longest side is always less than the sum of the other two sides. Suppose the triangle constructed is scalene with sides a <b <c. If a and b are consecutive numbers in the list then the longest side c is the next number in the list or a larger one and a+b ≤ c, a contradiction of the triangle inequality. If a and b are not consecutive numbers in the list, let d be the number just before b, so that a < d < b. We then have a+b < d +b. But by the previous argument d +b ≤ c, so by the transitivity of '<' we have a+b < c, again contradicting the triangle inequality.

Therefore the supposition is false and the triangle cannot be scalene and must have at least two sides equal.

QNo:- 91 ,Correct Answer:- B

Explanation:- The two triangles formed would be similar. Hence, 48/15 = 62/ x. ∴ x ≈ 19.4

QNo:- 92 ,Correct Answer:- 1260

Explanation:- LCM (28, 90) = 1260

QNo:- 93 ,Correct Answer:- D

Explanation:- Let the costs be 100, 200, 400 per unit.
Let the no. of units be 2, 5, 2

∴ The costs will be 200, 1000, 800 and total cost will be 2000.

10, 20 and 25 % resp. = 20, 200, 200

∴ The overall profit = 420.

∴ Overall profit % = 420 × 100/2000 = 21

QNo:- 94 ,Correct Answer:- 19500

Explanation:- Let the repayments be Rs. "a − d", Rs. "a" and Rs. "a + d"
a − d + a + a + d = 54000

3a = 54000
a = 18000

The payment at the end of year 2 is Rs. 18,000.
Borrowed amount = Rs. 45,000

Amount outstanding at the end of Year 1 = (45000 × 1.1) – (18000 – d)
  = 31500 + d

Amount outstanding at the end of Year 2 = {(31500 + d) × 1.1} – 18000
  = 34650 + 1.1d – 18000 = 16650 + 1.1d

Amount outstanding at the end of Year 3 = {(16650 + 1.1d) × 1.1} = 18000 + d
  18315 + 1.21d = 18000 + d

  0.21d = – 315 ⇒   d = –1500

The payments are Rs. 19500, Rs. 18000 and Rs. 16500

QNo:- 95 ,Correct Answer:- 3

Explanation:- *They meet for the first time 16 seconds after they start the race and for the second time 40 seconds from the time they start the race.*

Now, we do not know their relative positions when they start the race. But we know that the time between the first and second meeting is 24 seconds. This is the time when they cover a relative distance of one lap length.

Lap length /Relative Speed = 24 ∴ Relative speed = 5 m/s.

The question says – Now, if B had started in the opposite direction to the one he had originally started, they would have met for the first time after 40 seconds.

Now, B would have crossed each other after 40 seconds if B had reversed direction. This is higher than the 24 seconds it takes them to cover the relative distance of a lap in the first instance.

Or, in the first instance they were travelling towards each other.
Or, a + b = 5 m/s.
They meet for the first time 16 seconds after they start the race.

QNo:- 96 ,Correct Answer:- B

Explanation:- *He will cover 100 miles in 50 min. At 120 miles/ hr relative speed.*
In 5 min he passes 20 vehicles.
So in 50 min 20 × 10= 200 vehicles

QNo:- 97 ,Correct Answer:- C

Explanation:- *CP = 80 × 40*
Profit from the n objects = n% × 40 × n.

Profit from the remaining objects = (100 – n)% × 40 × (80 – n).
We need to find the minimum possible value of n% × 40 × n + (100 – n)% × 40 × (80 – n).
Or, we need to find the minimum possible value of n^2 + (100 – n) (80 – n).
Minimum of n^2 + n^2 – 180n + 8000
Minimum of n^2 – 90n + 4000
Minimum of n^2 – 90n + 2025 – 2025 + 4000

We add and subtract 2025 to this expression in order to crate an expression that can be expressed as a perfect square. This approach is termed as the "Completion of Squares" approach. We keep revisiting this in multiple chapters.

Minimum of n^2 – 90n + 2025 + 1975 = $(n – 45)^2$ + 1975
This reaches minimum when n = 45.

When n = 45, the minimum profit made
45% × 40 × 45 + 55% × 40 × 35
18 × 45 + 22 × 35 = 810 + 770 = Rs. 1580.

QNo:- 98 ,Correct Answer:- A

Explanation:- *There are in all 5 × 4 = 20 combinations of two wires taken at a time.*
Out of this there will only be one correct combination.
Therefore the probability that the agent will succeed = 1/20 = 5 %

QNo:- 99 ,Correct Answer:- 42

Explanation:- *Upto age 3, he has blown 3 out of 6 candles.*
He has in all blown 900 candles.
Thus the total no. of candles placed = 903, which is the sum of a natural series starting from 1.
The sum of first 42 terms of a natural series is 903.
Therefore his age is 42.

QNo:- 100 ,Correct Answer:- B

Explanation:- *Pick a side of length a. It shares a vertex with at least one side of length b. Thus, there*
is a vertex P where one side has length a and the other side has length b. Moreover, the same is true for the opposite vertex, R,
since it has the other sides of the quadrilateral.
Draw a diagonal between the other vertices, Q and S. Now QPS and QRS are triangles
with equal side lengths.
The area of each triangle can be found by A =1/2ab sin θ, where θ is the angle between the sides of length a and b. Maximally, sin
θ = 1 when we have right triangles, so the maximum area of the quadrilateral is 2×(1/2) ab = ab.