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VARC Section

Direction for Reading Comprehension: The pass ages given here are followed by some questions that have four answer choices; read the passage carefully and pick the option whose answer best aligns with the passage

Aggression is any behavior that is directed toward injuring, harming, or inflicting pain on another living being or group of beings. Generally, the victim(s) of aggression must wish to avoid such behavior in order for it to be considered true aggression. Aggression is also categorized according to its ultimate intent. Hostile aggression is an aggressive act that results from anger, and is intended to inflict pain or injury because of that anger. Instrumental aggression is an aggressive act that is regarded as a means to an end other than pain or injury. For example, an enemy combatant may be subjected to torture in order to extract useful intelligence, though those inflicting the torture may have no real feelings of anger or animosity toward their subject. The concept of aggression is very broad, and includes many categories of behavior (e.g., verbal aggression, street crime, child abuse, spouse abuse, group conflict, war, etc.). A number of theories and models of aggression have arisen to explain these diverse forms of behavior, and these theories/models tend to be categorized according to their specific focus. The most common system of categorization groups the various approaches to aggression into three separate areas, based upon the three key variables that are present whenever any aggressive act or set of acts is committed. The first variable is the aggressor him/herself. The second is the social situation or circumstance in which the aggressive act(s) occur. The third variable is the target or victim of aggression.

Regarding theories and research on the aggressor, the fundamental focus is on the factors that lead an individual (or group) to commit aggressive acts. At the most basic level, some argue that aggressive urges and actions are the result of inborn, biological factors. Sigmund Freud (1930) proposed that all individuals are born with a death instinct that predisposes us to a variety of aggressive behaviors, including suicide (self directed aggression) and mental illness (possibly due to an unhealthy or unnatural suppression of aggressive urges). Other influential perspectives supporting a biological basis for aggression conclude that humans evolved with an abnormally low neural inhibition of aggressive impulses (in comparison to other species), and that humans possess a powerful instinct for property accumulation and territorialism. It is proposed that this instinct accounts for hostile behaviors ranging from minor street crime to world wars. Hormonal factors also appear to play a significant role in fostering aggressive tendencies. For example, the hormone testosterone has been shown to increase aggressive behaviors when injected into animals. Men and women convicted of violent crimes also possess significantly higher levels of testosterone than men and women convicted of nonviolent crimes. Numerous studies comparing different age groups, racial/ethnic groups, and cultures also indicate that men, overall, are more likely to engage in a variety of aggressive behaviors (e.g., sexual assault, aggravated assault, etc.) than women. One explanation for higher levels of aggression in men is based on the assumption that, on average, men have higher levels of testosterone than women.

Q.1. The author identifies three essential factors according to which theories of aggression are most commonly categorised. Which of the following options is closest to the factors identified by the author?

1. Psychologically – Sociologically – Medically.

2. Aggressor – Circumstances of aggression – Victim.

3. Extreme – Moderate – Mild.

4. Hostile – Instrumental – Hormonal.

Q.2. The author discusses all of the following arguments in the passage EXCEPT that:

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

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

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

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

Q.3. All of the following statements can be seen as logically implied by the arguments of the passage EXCEPT:

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

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

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

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

Q.4. "[A]n enemy combatant may be subjected to torture in order to extract useful intelligence, though those inflicting the torture may have no real feelings of anger or animosity toward their subject." Which one of the following best explicates the larger point being made by the author here?

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

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

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

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

Direction for Reading Comprehension: The pass ages given here are followed by some questions that have four answer choices; read the passage carefully and pick the option whose answer best aligns with the passage

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

But . . . where does piracy begin or end? According to St Augustine, a corsair captain once told Alexander the Great that in the forceful acquisition of power and wealth at sea, the difference between an emperor and a pirate was simply one of scale. By this logic, European empire-builders were the most successful pirates of all time. A more eclectic history might have included the conquistadors, Vasco da Gama and the East India Company. But Lehr sticks to the disorganised small fry, making comparisons with the renegades of today possible.

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

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

Modern pirate prevention has failed. After the French yacht Le Gonant was ransomed for $2million in 2008, opportunists from all over Somalia flocked to the coast for a piece of the action. . . . A consistent rule, even today, is there are never enough warships to patrol pirate-infested waters. Such ships are costly and only solve the problem temporarily; Somali piracy is bound to return as soon as the warships are withdrawn. Robot shipping, eliminating hostages, has been proposed as a possible solution; but as Lehr points out, this will only make pirates switch their targets to smaller carriers unable to afford the technology.

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

Q.5. "Why toil away as a starving peasant in the 16th century when a successful pirate made up to £4,000 on each raid?" In this sentence, the author's tone can best be described as being:

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

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

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

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

Q.6. “A more eclectic history might have included the conquistadors, Vasco da Gama and the East India Company. But Lehr sticks to the disorganised small fry . . .” From this statement we can infer that the author believes that:

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

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

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

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

Q.7. We can deduce that the author believes that piracy can best be controlled in the long run:

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

2. through international cooperation in enforcing stringent deterrents.

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

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

Q.8 The author ascribes the rise in piracy today to all of the following factors EXCEPT:

1. colonialism’s disruption of historic ties among countries.

2. decreased surveillance of the high seas.

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

4. the growth in international shipping with globalisation.

Direction for Reading Comprehension: The pass ages given here are followed by some questions that have four answer choices; read the passage carefully and pick the option whose answer best aligns with the passage

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

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

Second, the study of visual culture must scrutinize visual practice as much as images themselves, asking what images do when they are put to use. If scholars engaged in this enterprise inquire what makes an image beautiful or why this image or that constitutes a masterpiece or a work of genius, they should do so with the purpose of investigating an artist’s or a work’s contribution to the experience of beauty,

taste, value, or genius. No amount of social analysis can account fully for the existence of Michelangelo or Leonardo. They were unique creators of images that changed the way their contemporaries thought and felt and have continued to shape the history of art, artists, museums, feeling, and aesthetic value. But study of the critical, artistic, and popular reception of works by such artists as Michelangelo and Leonardo can shed important light on the meaning of these artists and their works for many different people. And the history of meaning-making has a great deal to do with how scholars as well as lay audiences today understand these artists and their achievements.

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

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

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

Q.9. “No amount of social analysis can account fully for the existence of Michelangelo or Leonardo.” In light of the passage, which one of the following interpretations of this sentence is the most accurate?

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

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

3. No analyses exist of Michelangelo’s or Leonardo’s social accounts.

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

Q.10. “Seeing . . . operates on the foundation of covenants with images that establish the conditions for meaningful visual experience.” In light of the passage, which one of the following statements best conveys the meaning of this sentence?

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

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

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

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

Q.11. Which set of keywords below most closely captures the arguments of the passage?

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

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

3. Imagery, Visual Practices, Lifeworlds, Structures of Perception.

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

Q.12. All of the following statements may be considered valid inferences from the passage, EXCEPT:

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

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

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

4. visual culture is not just about how we see, but also about how our visual practices can impact and change the world.

Q.13. Which one of the following best describes the word "epiphenomena" in the last sentence of the passage?

1. Phenomena amenable to analysis.

2. Visual phenomena of epic proportions.

3. Phenomena supplemental to the evidence.

4. Overarching collections of images.

Direction for Reading Comprehension: The pass ages given here are followed by some questions that have four answer choices; read the passage carefully and pick the option whose answer best aligns with the passage

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

Although an emerging sector, renewables are enmeshed in long-standing resource extraction through their dependence on minerals and metals . . . Scholars document the negative consequences of mining . . . even for mining operations that commit to socially responsible practices[:] "many of the world's largest reservoirs of minerals like cobalt, copper, lithium,[and] rare earth minerals"—the ones needed

for renewable technologies— "are found in fragile states and under communities of marginalized peoples in Africa, Asia, and Latin America." Since the demand for metals and minerals will increase substantially in a renewable-powered future . . . this intensification could exacerbate the existing consequences of extractive activities.

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

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

Q.14 Based on the passage, we can infer that the author would be most supportive of which one of the following practices?

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

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

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

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

Q.15. All of the following statements, if true, could be seen as supporting the arguments in the passage, EXCEPT:

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

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

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

4. The possible negative impacts of renewable energy need to be studied before it can be offered as a financial investment opportunity.

Q.16. Which one of the following statements, if false, could be seen as best supporting the arguments in the passage?

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

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

3. The production and distribution of renewable energy through small-scale, localsystems is not economically sustainable.

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

Q.17. Which one of the following statements, if true, could be an accurate inference from the first paragraph of the passage?

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

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

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

4. The author does not think renewable energy systems can be as efficient as nonrenewable energy systems.

Q.18. Which one of the following statements best captures the main argument of the last paragraph of the passage?

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

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

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

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

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

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

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

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

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

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

Q.20. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

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

2. Psychologists use the term 'change blindness' to describe this tendency of people to be blind to changes though they are in the immediate environment.

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

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

Q.21. Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

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

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

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

4. There is, alongside the world of monopolised information and surveillance, a different dynamic growing up: information as a social good, incapable of being owned or exploited or priced.

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

Q.22. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

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

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

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

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

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

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

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

2. Completed in 2006, the Very Large Telescope (VLT) has four reflecting telescopes,8.2 m in diameter that can observe objects 4 billion times weaker than can normally be seen with the naked eye.

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

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

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

All humans make decisions based on one or a combination of two factors. This is either intuition or information. Decisions made through intuition are usually fast, people don't even think about the problem. It is quite philosophical, meaning that someone who made a decision based on intuition will have difficulty explaining the reasoning behind it. The decision-maker would often utilize her senses in drawing conclusions, which again is based on some experience in the field of study. On the other side of the spectrum, we have decisions made based on information. These decisions are rational — it is based on facts and figures, which unfortunately also means that it can be quite slow. The decision-maker would frequently use reports, analyses, and indicators to form her conclusion. This methodology results in accurate, quantifiable decisions, meaning that a person can clearly explain the rationale behind it.

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

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

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

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

Q.25. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

The rural-urban continuum and the heterogeneity of urban settings pose an obvious challenge to identifying urban areas and measuring urbanization rates in a consistent way within and across countries. An objective methodology for distinguishing between urban and rural areas that is based on one or two metrics with fixed thresholds may not adequately capture the wide diversity of places. A

richer combination of criteria would better describe the multifaceted nature of a city's function and its environment, but the joint interpretation of these criteria may require an element of human judgment.

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

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

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

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

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

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

2. Of all the changes introduced by man into the household of nature, [controlled]largescale nuclear fission is undoubtedly the most dangerous and most profound.

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

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

LRDI Section

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

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

1. Two adjacent beads along the same row or column are always of different colours.

2. There is at least one Green bead between any two Blue beads along the same row or column.

3. There is at least one Blue and at least one Green bead between any two Red beads along the same row or column.

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

Q.27. The total number of possible configuration using beads of only two colours is:

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

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

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

A chain of departmental stores has outlets in Delhi, Mumbai, Bengaluru and Kolkata. The sales are categorized by its three departments – 'Apparel', 'Electronics', and 'HomeDecor'. An Accountant has been asked to prepare a summary of the 2018 and 2019 sales amounts for an internal report. He has collated partial information and prepared the following table.

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

The following additional information is known.

1. The sales amounts in the Apparel departments were the same for Delhi and Kolkata in 2018.

2. The sales amounts in the Apparel departments were the same for Mumbai and Bengaluru in 2018. This sales amount matched the sales amount in the Apparel department for Delhi in 2019.

3. The sales amounts in the HomeDecor departments were the same for Mumbai and Kolkata in 2018.

4. The sum of the sales amounts of four Electronics departments increased by the same amount as the sum of the sales amounts of four Apparel departments from 2018 to 2019.

5. The total sales amounts of the four HomeDecor departments increased by Rs 70 Crores from 2018 to 2019.

6. The sales amounts in the HomeDecor departments of Delhi and Bengaluru each increased by Rs 20 Crores from 2018 to 2019.

7. The sales amounts in the Apparel departments of Delhi and Bengaluru each increased by the same amount in 2019 from 2018. The sales amounts in the Apparel departments of Mumbai and Kolkata also each increased by the same amount in 2019 from 2018.

8. The sales amounts in the Apparel departments of Delhi, Kolkata and Bengaluru in 2019 followed an Arithmetic Progression.

Q.31. In HomeDecor departments of which cities were the sales amounts the highest in 2018 and 2019, respectively?

1. Delhi and Delhi

2. Mumbai and Mumbai

3. Bengaluru and Delhi

4. Mumbai and Delhi

Q.32. What was the increase in sales amount, in Crore Rupees, in the Apparel department of Mumbai from 2018 to 2019?

1. 12

2. 5

3. 10

4. 8

Q.33. Among all the 12 departments (i.e., the 3 departments in each of the 4 cities), what was the maximum percentage increase in sales amount from 2018 to 2019?

1. 75

2. 50

3. 28

4. 25

Q.34. What was the total sales amount, in Crore Rupees, in 2019 for the chain of departmental stores?

1. 750

2. 150

3. 600

4. 900

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

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

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

Answer the following questions INDEPENDENTLY of each other.

Q.35. Initially cars numbered 1, 2, 3, and 4 arrive among which 1 and 4 are SUVs while 2 and 3 are compact cars. Car 1 then leaves, followed by the arrivals of car 5 (a compact car) and car 6 (an SUV). Car 4 then leaves. Then car 7 (an SUV) and car 8 (a compact car) arrive. At this moment, which among the following numbered car is parked next to car 3?

1. 8

2. 6

3. 5

4. 7

Q.36. Suppose eight cars have arrived, of which two have left. Also suppose that car 4 is a compact and car 7 is an SUV. Which of the following is a POSSIBLE current configuration of the parking lot?

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

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

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

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

Q.37. Suppose the sequence at some point of time is 4, 5, 6, V, 3. Which of the following is NOT necessarily true?

1. Car 5 is a compact.

2. Car 4 is a compact.

3. Car 3 is an SUV.

4. Car 1 is an SUV.

Q.38. Suppose that car 4 is not the first car to leave and that the sequence at a time between the arrival of the car 7 and car 8 is V, 7, 3, 6, 5. Then which of the following statements MUST be false?

1. Car 7 is a compact.

2. Car 4 is an SUV.

3. Car 6 is a compact.

4. Car 2 is a compact.

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

Each student is guided by one among P, Q, R, S and T. Two students are guided by each of P, R and T, while one student is guided by each of Q and S. Each student is guided by a guide belonging to their department. Each seminar is to be scheduled in one of four consecutive 30-minute slots starting at 9:00 am, 9:30 am, 10:00 am and 10:30 am on the same day. More than one seminars can be scheduled in a

slot, provided the guide is free. Only three rooms are available and hence at the most three seminars can be scheduled in a slot. Students who are guided by the same guide must be scheduled in consecutive slots.

The following additional facts are also known.

1. Seminars by students from Economics are scheduled in each of the four slots.

2. A's is the only seminar that is scheduled at 10:00 am. A is guided by R.

3. F is an Anthropology student whose seminar is scheduled at 10:30 am.

4. The seminar of a Sociology student is scheduled at 9:00 am.

5. B and G are both Sociology students, whose seminars are scheduled in the same slot. The seminar of an Economics student, who is guided by T, is also scheduled in the same slot.

6. P, who is guiding both B and C, has students scheduled in the first two slots.

7. A and G are scheduled in two consecutive slots.

Q.39. Which one of the following statements is true?

1. Three seminars are scheduled in the last slot.

2. Only one seminar is scheduled in the second slot.

3. Two seminars are scheduled in the first slot.

4. Three seminars are scheduled in the first slot.

Q.40. Who all are NOT guiding any Economics students?

1. P, R and S

2. P, Q and R

3. P, Q and S

4. Q, R and S

Q.41. Which of the following statements is necessarily true?

1. S is guiding F.

2. Q is guiding G.

3. B is scheduled in the first slot.

4. H is an Economics student.

Q.42. If D is scheduled in a slot later than Q's, then which of the following two statement(s) is(are) true?

(i) E and H are guided by T.

(ii) G is guided by Q.

1. Only (ii)

2. Neither (i) nor (ii)

3. Both (i) and (ii)

4. Only (i)

Q.43. If E and Q are both scheduled in the same slot, then which of the following statements BEST describes the relationship between D, H, and T?

1. Both D and H are guided by T.

2. At least one of D and H is guided by T.

3. Exactly one of D and H is guided by T.

4. Neither D nor H is guided by T.

Q.44. If D is scheduled in the slot immediately before Q's, then which of the following is NOT necessarily true?

1. G is guided by Q.

2. E is guided by R.

3. D is guided by T.

4. F is guided by S.

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

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

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

	Constituency			
	A	B	C	D
No. of candidates contesting	10	12	5	8
Total No. of valid votes polled	5,00 ,000	3,25,000	6,00,030	
No. of votes polled by the winning	2,75,000	48,750		

candidate				
No. of votes polled by the first runner up	95,000			37,500
No. of votes polled by the second runner up				30,000
% of valid votes polled by the third runner up				10%

The following additional facts are known:

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

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

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

Q.45. What is the percentage of votes polled in total by all the candidates who lost their security deposits while contesting for constituency A?

Q.46. How many candidates who contested in constituency B lost their security deposit?

Q.47. What BEST can be concluded about the number of votes polled by the winning candidate in constituency C?

1. 1,40,006

2. less than 2,00,010

3. 1,40,010

4. between 1,40,005 and 1,40,010

Q.48. What was the number of valid votes polled in constituency D?

1. 1,75,000

2. 1,50,000

3. 1,25,000

4. 62,500

Q.49. The winning margin of a constituency is defined as the difference of votes polled by the winner and that of the first runner up. Which of the following CANNOT be the list of constituencies, in increasing order of winning margin?

1. B, D, C, A

2. D, B, C, A

3. B, C, D, A

4. D, C, B, A

Q.50. For all the four constituencies taken together, what was the approximate number of votes polled by all the candidates who lost their security deposit expressed as a percentage of the total valid votes from these four constituencies?

1. 23.91%

2. 23.54%

3. 32.00%

4. 38.25%

CAT Quant Section

Q.51. The sum of the perimeters of an equilateral triangle and a rectangle is 90 cm. The area, T, of the triangle and the area, R, of the rectangle, both in sq cm, satisfy the relationship R=T^2. If the sides of the rectangle are in the ratio 1: 3, then the length, in cm, of the longer side of the rectangle, is

1. 24

2. 27

3. 21

4. 18

Q.52. In May, John bought the same amount of rice and the same amount of wheat as he had bought in April, but spent ₹ 150 more due to price increase of rice and wheat by 20% and 12%, respectively. If John had spent ₹ 450 on rice in April, then how much did he spend on wheat in May?

1. ₹ 580

2. ₹ 570

3. ₹ 560

4. ₹ 590

Q.53. In a car race, car A beats car B by 45 km, car B beats car C by 50 km, and car A beats car C by 90 km. The distance (in km) over which the race has been conducted is

1. 500

2. 475

3. 550

4. 450

Q.54. John takes twice as much time as Jack to finish a job. Jack and Jim together take onethirds of the time to finish the job than John takes working alone. Moreover, in order to finish the job, John takes three days more than that taken by three of them working together. In how many days will Jim finish the job working alone?

Q.55. Let the m-th and n-th terms of a geometric progression be 3/4 and 12 , respectively, where m<n. If the common ratio of the progression is an integer r, then the smallest

possible value of r + n - m is

1. -2

2. 2

3. 6

4. -4

Q.56. If x and y are positive real numbers satisfying x+y=102, then the minimum possible value of $2601(1+\frac{1}{x})(1+\frac{1}{y})$ is

Q.57. The value of $\log_a\left(\frac{a}{b}\right)+\log_b\left(\frac{b}{a}\right)$, for $1<a\le b$ cannot be equal to

1. -0.5
2. 1
3. 0
4. -1

Q.58. In how many ways can a pair of integers (x , a) be chosen such that $x^2-2|x|+|a-2|=0$?

1. 4

2. 5

3. 6

4. 7

Q.59. Students in a college have to choose at least two subjects from chemistry, mathematics and physics. The number of students choosing all three subjects is 18, choosing mathematics as one of their

subjects is 23 and choosing physics as one of their subjects is 25. The smallest possible number of students who could choose chemistry as one of their subjects is

1. 20

2. 22

3. 19

4. 21

Q.60. For real x, the maximum possible value of $\frac{x}{\sqrt{1+x^4}}$ is

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

2. 1

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

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

Q.61. Aron bought some pencils and sharpeners. Spending the same amount of money as Aron, Aditya bought twice as many pencils and 10 less sharpeners. If the cost of one sharpener is ₹ 2 more than the cost of a pencil, then the minimum possible number of pencils bought by Aron and Aditya together is

1. 30

2. 33

3. 27

4. 36

Q.62. A sum of money is split among Amal, Sunil and Mita so that the ratio of the shares of Amal and Sunil is 3:2, while the ratio of the shares of Sunil and Mita is 4:5. If the difference between the largest and the smallest of these three shares is Rs 400, then Sunil's share, in rupees, is

Q.63. Anil buys 12 toys and labels each with the same selling price. He sells 8 toys initially at 20% discount on the labeled price. Then he sells the remaining 4 toys at an additional 25% discount on the discounted price. Thus, he gets a total of Rs 2112, and makes a 10% profit. With no discounts, his percentage of profit would have been

1. 60

2. 55

3. 50

4. 54

Q.64. Two circular tracks T1 and T2 of radii 100 m and 20 m, respectively touch at a point A. Starting from A at the same time, Ram and Rahim are walking on track T1 and track T2 at speeds 15 km/hr and 5

km/hr respectively. The number of full rounds that Ram will make before he meets Rahim again for the first time is

1. 4

2. 3

3. 2

4. 5

Q.65. How many 4-digit numbers, each greater than 1000 and each having all four digits distinct, are there with 7 coming before 3

Q.66. The number of pairs of integers (x , y) satisfying x>=y>=-20 and 2x+5y=99 is

Q.67. If x and y are non-negative integers such that x + 9 = z, y + 1 = z and x + y < z + 5, then the maximum possible value of 2x + y equals

Q.68. A and B are two points on a straight line. Ram runs from A to B while Rahim runs from B to A. After crossing each other, Ram and Rahim reach their destinations in one minute and four minutes, respectively. If they start at the same time, then the ratio of Ram's speed to Rahim's speed is

1.2

2.$\sqrt{2}$

3.2$\sqrt{2}$

4.1/2

Q.69. The distance from B to C is thrice that from A to B. Two trains travel from A to C via B. The speed of train 2 is double that of train 1 while traveling from A to B and their speeds are interchanged while traveling from B to C. The ratio of the time taken by train 1 to that taken by train 2 in travelling from A to C is

1. 1: 4

2. 7: 5

3. 5: 7

4. 4: 1

Q.70. Let C be a circle of radius 5 meters having center at O. Let PQ be a chord of C that passes through points A and B where A is located 4 meters north of O and B is located 3 meters east of O. Then, the length of PQ, in meters, is nearest to

1. 7.2

2. 7.8

3. 6.6

4. 8.8

Q.71. The number of integers that satisfy the equality $(x^2 - 5x + 7)^{x+1} = 1$ is

1. 2

2. 3

3. 5

4. 4

Q.72. Let $f(x) = x^2 + ax + b$ and g(x)=f9x+1)-f(x-1). If f(x) 0 ≥ for all real x, and g(20) =72 , then the smallest possible value of b is

1. 1

2. 16

3. 0

4. 4

Q.73. Let C1 and C2 be concentric circles such that the diameter of C1 is 2 cm longer than that of C2. If a chord of C1 has length 6 cm and is a tangent to C2, then the diameter, in cm, of C1 is

Q.74. From an interior point of an equilateral triangle, perpendiculars are drawn on all three sides. The sum of the lengths of the three perpendiculars is s. Then the area of the triangle is

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

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

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

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

Q.75. For the same principal amount, the compound interest for two years at 5% per annum exceeds the simple interest for three years at 3% per annum by Rs 1125. Then the principal amount in rupees is

Q.76. In a group of 10 students, the mean of the lowest 9 scores is 42 while the mean of the highest 9 scores is 47. For the entire group of 10 students, the maximum possible mean exceeds the minimum possible mean by

1. 4

2. 3

3. 5

4. 6

Answer Keys

1.2	2.4	3.2	4.3	5.3	6.2	7.3	8.2	9.4	10.3	11.3	12.1
13.3	14.2	15.4	16.4	17.3	18.4	19.4	20.1342		21.2	22.1	23.2143
24.3	25.2	26.2413		27.2	28.9	29.6	30.6	31.1	32.1	33.2	34.4
35.4	36.2	37.3	38.3	39.3	40.3	41.4	42.3	43.2	44.2	45.9	46.11
47.1	48.1	49.3	50.1	51.2	52.3	53.4	54.4	55.1	56.2704		57.2
58.4	59.1	60.3	61.2	62.800	63.3	64.2	65.315	66.17	67.23	68.1	69.3
70.4	71.2	72.4	73.10	74.2	75.90000		76.1				

Solutions

Solution 1: This is the easiest question of the passage. The clue to the right answer is given in the last part of the first paragraph. Reading that part is enough to spot the right choice. It says there are three variables present in an aggressive act. They are: the aggressor, the circumstances, and the victim.

[Option: 2]

Solution 2:

We must remember that this is an except question. We must pick the choice that is not presented as the author's argument. Choice 1 goes out because the author discusses it towards the end of the passage. Men have higher levels of testosterone, resulting in higher aggression. The second sentence of the last paragraph provides clue for choice 2. Thus 2 is also eliminated. The first paragraph elaborately describes the varying nature of aggression. Thus 3 also is eliminated. The moderation of death instinct is nowhere discussed in the passage, although the presence of death instinct is discussed. Thus 4 is the right choice.

[Option: 4]

Solution 3:

Though this is an except question, this question can be easily answered if we look for the phrase "neural regulation" in the passage. The neural inhibition has been discussed with regards to aggressive impulses, not the hormone testosterone. Thus 2 is definitely not implied by the author. Once we have found the

right answer there is no need to verify the others. The rest of the options, however, do find indirect reference in the passage.

[Option: 2]

Solution 4:

The point made by the author in the quoted remark is that you may be aggressive without any real feelings of anger or animosity. Why? Because inflicting pain is not the objective, but serves some other end. Thus 3 directly becomes the right choice. This was a very easy question.

[Option: 3]

Solution 5:

This is a passage easy to read and understand. The very first question is author's tone in the given sentence. Indignant means angry, but there is no anger as the author is relating to something that used to happen 400 years ago. The author is not trying to be analytical, rather he is trying to be ironical. Irony is used to highlight a situation by using contrast in an amusing way. His intention is not to discuss the contrast between peasant life and pirate life way back in the 16th century. 3 is the best choice.

[Option: 3]

Solution 6:

The author by giving the example of Vasco da Gama and the east India company to suggest that they both were not very different from piracy. Options 2 brings out that suggestion appropriately. 1 goes out because the author does consider them as pirates. 3 might look like a good choice but the phrase "laid the ground for modern piracy" brings something that is not implied or stated in the passage. 4 could have been another close choice, but the author's intention is not to compare the disorganized piracy of today with the organized piracy of the past. His intention is to compare the disorganized small piracy of the past with the renegades of today. It is small Vs small, and not small Vs big. 2 is the right answer.

[Option: 2]

Solution 7:

At the end of the fourth paragraph the author says that "root causes of piracy today are the same as they were a couple of hundred years ago". What were the causes a couple of hundred years ago? According to the author it is poverty. Thus he believes that eliminating poverty will solve the problem. Thus 3 is the right choice. All the other choices are mentioned only to show that they haven't brought the desired results.

[Option: 3]

Solution 8:

We have to pick the choice that is not the cause behind the rise in piracy. 1 goes out because it is the cause. The first sentence of the fourth paragraph offers the clue. The third paragraph says that "the main motive for piracy has always been a combination of need and greed...". Thus 3 also is correct, as a

cause of piracy. The fourth paragraph has clue to option 4 as well. Thus 2 is the right choice. The author believes that surveillance can never be an effect solution because it is not addressing the root cause.

[Option: 2]

Solution 9:

This is so simple a question that one will not feel like marking the right choice just because it is too straightforward. The author in the third paragraph says that the study of visual culture is very important to understand the agents, practices and institutions that put images to work. Then he further goes to say that "no amount of social analysis (visual culture) can account fully for the existence of Michelangelo or Leonardo. They were unique creators. Choice 4 is very close to this statement. It is so easy that one is highly likely to miss out on this. Choice 2 is close but a little absurd. It says that because they are genius they cannot be subjected to social analysis. The author says that we may have social analysis of these artists but no matter how much we analyse; the analysis may not be enough.

[Option: 4]

Solution 10:

This question asks us to interpret a phrase given in the passage. For meaningful visual experience, we need the conditions, which operate on the foundation of covenants. 3 precisely captures that meaning. In fact, the question asks us to pick the option that is similar in content to the one given in the question. 1 could have been close but it distorts the idea by saying "when there is foundational condition established in images". It suggests that the foundation is established in images. Only 3 correctly rephrases the whole idea given in the question

[Option: 3]

Solution 11:

This was an easy question. Two keywords are very important, one is visual images or imagery, and the other is visual culture or practices. Both these are important as per the first paragraph of the passage and only in choice 3 can we find these two keywords. Thus 3 is the best choice. 4 misses on imagery or visual images. 2 misses on the visual culture. 1 misses both visual culture and images.

[Option: 3]

Solution 12:

We have to mark the choice that is not a valid inference. 2 can be inferred from last paragraph. 4 can be inferred from the first paragraph, and also the paragraph that discusses Michelangelo and Leonardo. In the third last paragraph the author says "how artifacts contribute to the construction of a world...". Thus 3 also can be inferred. 1 cannot be inferred because structures of perception have been discussed as a physiological process, not as an institutional structure. Thus 1 is farfetched and the right choice as it cannot be inferred.

[Option: 1]

Solution 13:

To mark the correct answer, we must understand the meaning of epiphenomenon, which means a secondary effect or a by-product. 3 is the right choice because supplemental means “provided in addition to”. Thus by-product=supplemental.

[Option: 3]

Solution 14:

The question asks us to pick a choice that the author would be most supportive of. 1 goes out because the author in the last paragraph says that localised renewable energy systems is unlikely to generate high returns for investors. 2 can be definitely inferred because the author clearly says at the end of second last para that disposal of toxic waste has perpetuated social injustice. Thus 2 is the right choice. For many 3 might be a tempting choice, but it is beside the point. The author is not concerned with more environment friendly carbon based fuels. He is talking about renewable energy sources, and the social and financial costs behind it. The whole discussion in the passage is based on the premise that we have already taken the path low carbon based renewable energy path. So the suggestion in 3 is pointless. 4 goes out because the author is not favouring any study. He wants resolution to the problem, so he wants action.

[Option: 2]

Solution 15:

This is a slightly difficult question. But 1 definitely supports the author. It must go out. We can find the evidence in the second paragraph. The second sentence of the last paragraph provides evidence for the 2nd choice. The third choice has already been inferred while solving the earlier question. It can be found in the last sentence of the second last para. 4 is the right answer because there is no reference for it in the passage. We have to mark the answer based on the evidence that we see in the passage.

[Option: 4]

Solution 16:

This is the easiest question of the passage. We have to first falsify the choice and then see whether it is supporting the arguments in the passage. Choice 4, when falsified, says that renewable energy systems have an environmental impact. If that is the case, the author’s arguments find support in the passage. Thus 4 is the right choice. 1 goes out because the author says in the passage that renewable energy systems are not as profitable as nonrenewable energy systems. The Last sentence of the first paragraph provides evidence for this. The profitability aspect has been discussed in the last paragraph of the passage. Thus it takes care of both 2 and 3, because if the profitability is low, it means that the expense is high, and therefore economically unsustainable. Thus all 1,2 and 3 support the author without being negated, whereas 4 supports the author only when it is negated

[Option: 4]

Solution 17:

This question is an easy question because to find the answer we have to read only the first paragraph. The author says “...but renewables need to be further scrutinized...”. This suggests that the author has some reservations or doubts pertaining to renewable energy. Thus 3 is the right choice. A very easy

question indeed. 1 goes out because it talks of nonrenewable energy systems. 2 goes out because the author is equally concerned about environmental and social impact of renewable energy systems. 4 finds no mention in the passage and the first paragraph.

[Option: 3]

Solution 18:

This is a pretty interesting question. The author says “renewable energy can be produced at the household or neighbourhood level...but such small scale localised production is unlikely to generate high returns for investors.” This is a double edged sword. 2 goes out because efficiency has not at all been discussed in the last paragraph. Corporate control is indeed discussed but not in reference to democratic distribution of energy. Thus 3 goes out. 1 goes out because renewable energy has been discussed as a single idea, without any forms and types. Thus 1 also is a distortion

[Option: 4]

Solution 19:

The official answer for this question seems to be a little weird. Though 4 is the official answer, we believe that sentence 5 should have been the right choice. 2 will open the paragraph. 1 and 4 focus on the victim’s past. 1 says “victim’s trauma after the assault rarely gets the attention...” and 4 says “even the most charitable question seems to focus on the victim’s past...”. 3 finally concludes by saying “the result is that we don’t have much of a vocabulary for what happens in a victim’s life after the painful past...”. 5 should have been the right answer, but the official answer is 4.

[Answer: 4]

Solution 20:

This question is a difficult one, where two possible sequences might be correct. There is no doubt that 42 is one pair and 13 is the other. The point is which will come first 13 or 42. The official answer says 1342, though we believe that 4213 is just equally logical a sequence.

[Answer: 1342]

Solution 21:

This is a question of moderate difficulty. 1 points at some truth. We must try to find the sentence that connects with 1. How can we monopolize and protect data? By having intellectual property rights. Thus 31 form a pair. 4 adds another idea to the story; it says “alongside the world of monopolised information (already discussed in 31), we have information as a social good, incapable of being owned. 5 concludes by saying that “information good are freely replicable....it can be copied and pasted infinitely”. In the light of intellectual property rights, and free information goods, 2 seems to be the odd one out.

[Answer: 2]

Solution 22:

The passage has three important keywords: sovereign equality, sense of insecurity, and what was done to overcome that insecurity. The passage tells us that people delivered their rights to a sovereign power in return for the sovereign's provision of security. This was the only way to overcome the fear of insecurity. After all there is a give and take happening, and therefore there is a transaction. Thus 1 is the best choice. 2 misses on the people's sense of insecurity. 3 goes out because limiting the power of papacy is not the essence of the discussion. Choice 4 misses the idea of give and take, people give their rights to the sovereign in return for his protection. It misses the crucial word "transactional relationship".

[Option: 1]

Solution 23:

This is one of the easiest questions. 2 introduces the idea of VLT and mentions what it has. 1 comes as an addition and mentions the additional things that VLT has. 4 talks about what happens when these are combined. 3 is the result of that combination. Thus 2143 is the right sequence. A very easy question indeed!

[Answer: 2143]

Solution 24:

In the passage the author compares the two factors based on which humans make decisions. The first is intuition and the other is information. The author seems to be comparing the two without any preference. 1 goes out because it inaccurately says that "we choose intuition or information based on the time available". Nothing of this sort has been given in the passage. Time in not the causative factor here. 2 says "it is better". Since the author has not given any preference, it would be wrong to say which one is better. Thus 2 also goes out. 3 is the right summary, and captures the essence by stating that the difference is differential speed and ability to provide a rationale. 4 just focuses on intuition, and ignores the other factor entirely.

[Option: 3]

Solution 25:

There are three important keywords in this paragraph: the challenge posed by rural-urban continuum, the objective methodology with one or two metrics may not be enough to capture the wide diversity, it may require an element of human judgement. 2 captures all the keywords succinctly. 1 misses the element of human judgement, 3 also misses on the same. 4 goes out because it is not about the judgment of objective methodology, but human judgement coming as an additional factor to aid the methodology.

[Option: 2]

Solution 26:

This might a little tricky question, but without doubt 2 will open the paragraph. The resultant ionising radiation in 4 is a consequence of large scale nuclear fission mentioned in 2. Thus 24 form a pair. 4 and 1 are contrasting ideas, something that justifies the presence of the conjunction "but" in 1. The resultant ionising radiation has become the most serious agent of pollution... but the attention of the layman has

been captured by the atom bomb....3 comes as the appropriate conclusion. 3 can't come after 4 because both 4 and 3 talk nuclear fission, which does not justify the presence of the word "however" in 3. We use however to contrast two ideas, but both 4 and 3 talk of peaceful uses of atomic energy. Nuclear fission is used for purposes other than atomic bomb. Thus 2413 is the right sequence.

[Answer: 2413]

Solution 27:

As we need to use only two colours, in any row or column these two coloured beads will be placed alternately like

1	2	1	2	1

So we cannot place Red coloured beads at position 1 or two as between any two Red beads there must at least two beads (at least one green and at least one Blue). Hence, we can use only Green and Blue coloured beads.

We can have two possible configurations:

Configuration 1: Green bead is placed at top left corner

G	B	G	B	G
B	G	B	G	B
G	B	G	B	G
B	G	B	G	B
G	B	G	B	G

Configuration 2: Blue bead is placed at top left corner

B	G	B	G	G
G	B	G	B	B
B	G	B	G	G
G	B	G	B	B
B	G	B	G	G

Answer: 2

Solution 28:

Between Any two Red beads there must be at least two Beads. So any Row or column there can be maximum two red beads. If we place two red beads in each row then two columns will have three red bead which cannot be accepted.

R			R	
	R			R
R			R	
	R			R
R			R	

The above configuration is not correct.

So in the third row we will place only one Red bead at the middle of the third row. Also we will adjust other rows so that between any two Red beads there are at least two beads in any column.

R			R	
	R			R
		R		
R			R	
	R			R

So maximum 9 Red beads are possible in any configuration. At remaining places Green and Blue coloured beads can be placed in such way that all the conditions given are satisfied. There are multiple configurations are possible. One of the configurations is given as below.

R	G	B	R	G
G	R	G	B	R
B	G	R	G	B
R	B	G	R	G
G	R	B	G	R

Answer: 9

Solution 29:

To minimise number of Blue beads we need to maximise number of Red and Green beads. From the previous question solution, Maximum no. Red beads can be 9. The row in which has two red beads, we will place two green and one Blue bead additionally.

The row with only one red bead we will place two green and two blue beads additionally. So overall there will be minimum 6 Blue beads.

R	G	B	R	G
G	R	G	B	R
B	G	R	G	B
R	B	G	R	G
G	R	B	G	R

Answer: 6

Solution 30:

We can place maximum 6 more beads as shown below.

R			R	
		R		
	R			R
R			R	
		R		

Answer: 6

From (6)

HomeDecor

Delhi (2018) = 100-20 = 80

Bengaluru (2018) = 80-20 = 60

From (3)

HomeDecor

Let Mumbai (2018) = Kolkata (2018) = a

So, Data for HomeDecor will be as follows

Sales Amount (Crore Rupees)								
	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
HomeDecor	80	100	a	72	60	80	a	54

From (5)

$(80 + a + 60 + a) + 70 = (100 + 72 + 80 + 54)$

$2a + 210 = 306$

$2a = 96$

$a = 48$

We have found all the values for HomeDecor. Now we will find values for Apparels

From (1)

Apparels

Let Delhi (2018) = Kolkata (2018) = b

From (2)

Apparels

Let Mumbai (2018) = Bengaluru (2018) = Delhi (2019) = c

Sales Amount (Crore Rupees)								
	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
Apparels	b	c	c		c		b	54

From (7)

Apparels

Bengaluru (2019) = c + (c-b) = 2c -b

Also, Mumbai (2019) = c + (54-b) = c-b + 54

Sales Amount (Crore Rupees)								
	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
Apparels	b	c	c	c – b + 54	c	2c - b	b	54

Now there are two variables. We need two equations to get their values.

From (8)

Apparels 2019

Delhi - Kolkata = Kolkata - Bengaluru

Delhi + Bengaluru = 2 (Kolkata)

c + 2c - b = 2(54)

3c -b = 108 .....(I)

From (4) From 2018 to 2019

Total Increase in apparels Sales = Total Increase in Electronics Sales

[c + (c - b + 54) + (2c - b) + 54] - [b + c + c + b] = [98 + 102 + 70 + 100] - [78 + 82 + 90 + 80]

[4c - 2b + 108] - [2b + 2c] = 370 - 330

2c - 4b + 108 = 40

2c - 4b = - 68

c - 2b = - 34 ..... (II)

Solving (I) and (II) we get

b = 42 and c = 50

Substituting we get

Sales Amount (Crore Rupees)								
	Delhi		Mumbai		Bengaluru		Kolkata	
	2018	2019	2018	2019	2018	2019	2018	2019
Apparels	42	50	50	62	50	58	42	54
Electronics	78	98	82	102	90	70	80	100
HomeDecor	80	100	48	72	60	80	48	54

Solution 31:

HomeDecor 2018 Highest sales in Delhi

HomeDecor 2019 Highest Sales in Delhi

Option: 1

Solution 32:

62 - 50 = 12

Option: 1

Solution 33:

Maximum percentage increase is form Mumbai HomeDecor from 2018 to 2019 Percentage Increase=$\frac{72-48}{48} \times 100 = \frac{24}{48} \times 100 = 50\%$

Option: 2

Solution 34:

Sales Amount (Crore Rupees)					
	Delhi	Mumbai	Bengaluru	Kolkata	
	2019	2019	2019	2019	
Apparels	50	62	58	54	Total
Electronics	98	102	70	100	
HomeDecor	100	72	80	54	
	248	236	208	208	900

Option: 4

Solution 35:

The parking slots will be numbered as follows.

	1 (SUV)	2	3	4 (SUV)	
Car 1 leaves	V V	2	3	4 (SUV)	
Car 5 Arrives	5 V	2	3	4 (SUV)	
Car 6 (SUV) Arrives	5 V	2	3	4 (SUV)	6 (SUV)
Car 4 leaves	5 V	2	3	V V	6 (SUV)
Car 7 (SUV) Arrives	5 V	2	3	7 (SUV)	6 (SUV)
Car 8 Arrives	5 8	2	3	7 (SUV)	6 (SUV)

V – Vacant

The cars that are parked next to car 3 are car 2 and car 7.

Option: 4

Solution 36:

When cars 5 and 6 are present, car 7 cannot take a place between them. So , 5,7,6 is not possible.

8,2,3, V, 5,6,7 is possible in the following sequence of arrival of cars.

I. Cars 1,2,3,4,5,6 and 7 arrive one after the other.

II. Car 1 leaves

III. Car 8 arrives and is parked in the slot vacated by car 1

IV. Car 4 leaves.

V. 2,3,7,5,6,8 is not possible as car 7 (SUV) cannot be parked in place of car 4 (compact) while cars 3 and 5 are still parked. 8, 2, 3, V, 6,5,7 is not possible as car 6 cannot be between a vacant slot and to the left of car 5 for the following reasons.

If no slot is vacant when car 6 is arrived, it would have been parked to the right of car 5.

If car 4 (compact) left by the time car 6 arrives it would either be parked in the slot vacated by car 4 or to the right of car 5.

Option: 2

Solution 37:

From the given arrangement it can be understood that cars 1, 2 and 3 arrived first and then cars 1 and 2 left before cars 4, 5 and 6 arrived. Now, there are four slots to the left of car 3. Hence, cars 1 and 2 are SUVs. Since three out of four slots are occupied by cars 4, 5 and 6, all these are compact cars. Whether car 3 is a compact car or an SUV, the given arrangement is possible.

Option: 3

Solution 38:

As cars 3 and 5 are still in their positions and that car 4 is not the first car to leave, at least one of cars 1 and 2 left before car 4. Let us consider the following cases. Both cars 1 and 2 left before car 4: In this case car 6, whether it is a compact car or an SUV, would have been parked in the parking lots vacated by cars 1 and 2. Hence, this case is not possible.

Only car 1 left before car 4: As car 6 is parked in the lot vacated by car 4, car 7 would have been parked in place of car 1. But the s lot vacated by car 1 is still vacant. Hence, this case is not possible.

Only 2 left before car 4: If the car 2 is an SUV, car 6 would have been parked in that lot. Hence, cars 2 and 7 are compact cars. Car 1 left after car 7 arrived.

Option: 3

Given,

Students: A, B, C, D, E, F, G, H

Guides: P (2 students), Q (1 student), R (2 students), S (1 student), T (2 students)

Economics (4 students), Sociology (3 students), Anthropology (1 student)

Slots: 9:00, 9:30, 10:00, 10:30

From (1), one economics seminar is held in each of the four slots.

From (1) and (2), A is students of economics and is guided by R. Hence, R is from economics department (given, each student is guided by a guide belonging to their department).

The information from (1), (2), (3) and (4) can be tabulate as follows.

09:00	09:30	10:00	10:30
Eco	Eco	A - Eco - R	Eco
Socio			F - Anth-

From (5), two sociology seminars and one economics seminar are held in the same slot. It cannot be 10:00 slot or 10:30 slot as at most three seminars can be conducted in one slot.

From (5) and (7), seminars of B, G and T are held in 9:30 slot.

From (6) and the given point that students who are guided by the same guide must be scheduled in consecutive slots, C is a sociology student and his/her seminar is held in 9:00 slot.

09:00	09:30	10:00	10:30
Eco	Eco - T	A - Eco - R	Eco
C – Socio - P	B – Socio - P		F - Anth-
	G - Socio		

From the above we also know the following combination of guides, their subject and their students

P (2)	Sociology	B, C
Q (1)		
R (2)	Economics	A
S (1)		
T (2)	Economics	

We know that G is a sociology student and F is an anthropology student. Hence, the rest D, E and H are economics students. Thus, one among D, E and H (economics students) is guided by R and the remaining two are guided by T. Now, G and F are guided by Q and S in any order. We get the following combinations.

P (2)	Sociology	B, C
Q (1)	Anthropology/ Sociology	F/G
R (2)	Economics	A, (one of D, E, H)
S (1)	Sociology/Anthropology	G/F
T (2)	Economics	Two of D, E, H

It is also given that students who are guided by the same guide must be scheduled in consecutive slots. Hence, 9:00 economics seminar is of T and 10:30 seminar is that of R.

09:00	09:30	10:00	10:30
Eco - T	Eco - T	A - Eco - R	Eco - R
Socio	B - Socio		F - Anth-
	G - Socio		

Solution 39:

From the above table, it is clear that the statement that two seminars are scheduled in the first slot is true

Option: 3

Solution 40:

We know that R is guiding an economics student. Hence, choices with R can be are eliminated. None among P, Q and S is guiding an economics student.

Option: 3

Solution 41:

B is scheduled in the second slot. W e are not sure of who are guiding G and F. So, two other choice s are not necessarily true.

Option: 4

Solution 42:

D's seminar is scheduled later than Q's seminar, indicates that Q's seminar cannot be in the last slot. It implies F is guided by S and G by Q. Hence, statement (ii) is true. Now that Q's seminar is scheduled in the second slot, D's seminar is scheduled in the lost slot. i.e D is guided by R. Hence, E and H are guided by T. Thus, statement (i) is also true. Both (i) and (ii) are true.

Option: 3

Solution 43:

If E and Q are scheduled in the same slot, it is possible both in the second slot and the last slot. If it is in the second slot, then E is guided by T and one among D and E is also guided by T. If it is in the last slot, then E is guided by R and both D and E are guided by T. Thus, at least one of D and H is guided by T.

Option: 2

Solution 44:

If D is scheduled in the slot immediately before Q's, it is only possible with D is in the first slot and Q is in the second slot. It implies that D is guided by T, G is guided by Q and F is guided by S. One among E and

H is guided by T and the other one b y R, in any order. Hence the statement that E is guided by R is NOT necessarily true.

Option: 2

Solution 45:

Total valid votes in $A = 5,00,000$ Minimum no of valid votes required to save the security deposits $= \frac{1}{6} \times 5,00,000 = 83,334$

As per 1^{st} additional information $\Rightarrow$ the gap between 1^{st} and 2^{nd} runners up is 10,000 So the table for $A \Rightarrow$ total $\rightarrow 5,00,000$

Winner $\rightarrow 2,75,000$

1^{st} runner up $\rightarrow 55,000$

2nd runner up $\rightarrow 85,000$

Total $\rightarrow 4,55,000$

The valid votes got by the other 7 candidates $= 5,00,000 - 4,55,000$

$= 45,000$

$\therefore$ the % of votes by the candidates who lost the security deposit is $= \frac{45,000}{5,00,000} \times 100 = 9\%$

Answer: 9

Solution 46:

Total valid votes in A=3,25,000

Minimum no of valid votes required to save the security deposits $= \frac{1}{6} \times 3,25,000 = 54,167$

We can see the winner himself/herself has got 48,750 no of votes which is less than $\frac{1}{6}$ th of the total votes.

$\therefore$ all of the candidates got less than $\frac{1}{6}$ th of the valid votes.

$\therefore$ security deposits will be forfeited for all of the candidates as winner is exempted from this condition. (total no of such candidates $=12-1=11$)

Answer: 11

Solution 47:

As the additional information in condition (2)

The minimum difference in no of votes between any pair of candidates = 10,000 As there are 5 candidates in c, the possible distribution of valid is as follows.

Candidates	C_1	C_2	C_3	C_4	C_5	Total
	1,40,000	1,30,000	1,20,000	1,10,000	1,00,000*	6,00,000

Additional 30 votes can be distributed among them to maintain the gap at least 10,000. So the possible answer is 1,40,006

Option: 1

Solution 48:

Let the no of valid votes =100x

The table looks like the following:

Total votes $\rightarrow$100x

Winner $\rightarrow$ 39,375

1st $\rightarrow$37,500

2nd$\rightarrow$ 30,000

3rd $\rightarrow$10x

Total $\rightarrow$1,06,875

As the winner got 51 more than 1st runner up (as per 3)

Total no of votes has to be more than

$$\frac{39,375+37,500+30,000}{0.9}$$

$=1,10,208$

$\therefore$ option (62,500) is ruled out.

To eliminate two more options, lets consider 1,50,000 to be the correct one [as one option is less than \& the other one is the greater than this option]

$\therefore 100x = 1,50,000$

Total $\rightarrow 1,50,000$

Winner $\rightarrow 45,000$

$1^{st} \rightarrow 37,500$

$2^{nd} \rightarrow 30,000$

$3^{rd} \rightarrow 15,000$

Total $\rightarrow 1,06,875$

Minimum rates to save security deposits $= \frac{1}{6} \times 1,50,000 = 25,000$

So we can see except 3 candidates all others have lost their security deposits.

Candidates who saved their security deposits $= (100-35)\% = 65\%$[as per 3^{rd} additional inform]

$\therefore 65\%$ of $1,50,000 = 97,500$

$\rightarrow$ which is less than 1,12,500

$\therefore$ answer will be more than 1,50,000

Option: 1

Solution 49:

Margins

A $\rightarrow$ 2,75,000- 95,000 =1,80,000

B $\rightarrow$

C $\rightarrow$ 1,50,000 -1, 40,000 =10,000

D $\rightarrow$ 39,375 -37,500= 1,875

Clearly the margin in C is more than that of D. So clearly the sequence B , C , D , A is not possible.

Option: 3

Solution 50:

The no. of votes got by the candidates who has lost their security deposits is as follows

In A $\rightarrow 45,000$

In B $\rightarrow 3,25,000-48,750=2,76,250$

In C $\rightarrow 0$

In D $\rightarrow 1,75,000-46,250-37,500-30,000=61250$

$$\text{Req \%}=\frac{3,82,500}{5,00,000+3,25,000+6,00,000+1,75,000}\times 100$$

$$=\frac{3,82,500}{16,00,000}\times 100=23.91\%$$

Option: 1

Solution 51:

Let the breadth of the rectangle be b.

Length of the rectangle $= 3b$

Let a be the side of the equilateral triangle.

Given,

$$R = T^2 \Rightarrow 3b^2 = \left(\frac{\sqrt{3}}{4} \times a^2\right)^2 \Rightarrow b = a^2/4$$

Given,

$$2(4b) + 3a = 90$$

$$\Rightarrow 8\left(a^2/4\right) + 3a - 90 = 0$$

$$\Rightarrow 2a^2 + 3a - 90 = 0$$

$$\Rightarrow (a-6)(2a+15) = 0$$

$$\Rightarrow a = 6$$

$$\therefore b = 9$$

$$\Rightarrow 3b = 27$$

[Option: 2]

Solution 52:

Amount spent on rice in May = 450 *1.2= ?540.

If the amount spent on wheat in April is w, then in May it would be 1.12w.

Given, $(1.12w + 540) - (w + 450) = 150$

$$\Rightarrow 12w = 60$$

$$\Rightarrow w = 500$$

∴ The amount spent on wheat in May =1.12w i.e., ? 560

[Option: 3]

Solution 53:

Let the length of the racetrack be D.

When A covers D km, B covers (D -45) km and C covers (D-90) km

When B covers D km, C covers (D -50) km

The ratio of the speeds of the racers is same as the ratio of the distance travelled in a given time period.

Ratio of speed of B and C is $\frac{\text{Speed of } B}{\text{Speed of } C} = \frac{D-45}{D-90} = \frac{D}{D-50}$

$\Rightarrow \frac{D}{D-50} = \frac{45}{40}$

$\Rightarrow 40D = 45D - 50 \times 45$

$\Rightarrow D = 450$

[Option: 4]

Solution 54:

Let the individual times taken by John, Jack and Jim to complete the works be a, b and c respectively.

Given, $a = 2b \cdots (1)$

$\frac{bc}{b+c} = \frac{1}{3}(a) \cdots (2)$

$a - \left(\frac{abc}{ab+bc+ac}\right) = 3 \cdots (3)$

From (1) and (2), we've $c = 2b$

$$\therefore 2b-\left(\frac{2b\times b\times 2b}{(2b)(b)+b(2b)+(2b)(2b)}\right)=3$$

$$\Rightarrow b=2$$

$$\therefore c=4$$

[Answer: 4]

Solution 55:

$T_n=12$

$T_m=3/4$

$$\frac{T_n}{T_m}=\frac{ar^{n-1}}{ar^{m-1}}=\frac{12}{\frac{3}{4}}$$

$r^{n-m}=16=(\pm 2)^4=(\pm 4)^2$

To get the minimum value for $r+n-m, r$ should be minimum.

$\therefore r=-4$

$n-m=2$

$\therefore$ Required answer =-2

[Option: 1]

Solution 56:

$AM \geq GM \geq HM$

$$\frac{x+y}{2}\geq \sqrt{xy}\geq \frac{2}{\frac{1}{x}+\frac{1}{y}}$$

Given $x+y=102$

$\Rightarrow xy \le 51^2$ or $\frac{1}{xy} \ge \frac{1}{2601}$

$\Rightarrow \frac{1}{x}+\frac{1}{y} \ge \frac{2}{51}$

The minimum value of $2601\left(1+\frac{1}{x}\right)\left(1+\frac{1}{y}\right) = (2601)\left(1+\frac{1}{x}+\frac{1}{y}+\frac{1}{xy}\right)$

$= 2601\left(1+\frac{2}{51}+\frac{1}{2601}\right)$

=2704

[Answer: 2704]

Solution 57:

$\log_a\left(\frac{a}{b}\right)+\log_b\left(\frac{b}{a}\right)$

$= \log_a a - \log_a b + \log_b b - \log_b a$

$= 1-\log_a b+1-\log_b a \quad [\log_a n = 1]$

since $\left(\log_a b+\log_a b\right) \ge 2$

$\therefore$ The above value is ≤ 0.

$\therefore 1$ can't be the answer.

[Option: 2]

Solution 58:

$x^2 - 2|x| + |a-2| = 0$

$|x| = \frac{2 \pm \sqrt{4-4(|a-2|)}}{2}$

$|x| = 1 \pm \sqrt{1 - |a-2|}$

If $a > 2; |a-2| = a-2$

$|x| = 1 \pm \sqrt{1-(a-2)}$

$= 1 \pm \sqrt{3-a}$

since x is integer $3 - a \geq 0$

$a \leq 3$

The possible values of a is $= 3$

Then $x = \pm 1;$

If $a = 2, |x| = |1 \pm 1|, \Rightarrow x = \pm 2, 0$

If $a < 2, |a-2| = 2-a$

$|x| = 1 \pm \sqrt{1-(2-a)}$

$|x| = 1 \pm \sqrt{a-1}$

Since x is integer $a - 1 \geq 0 \Rightarrow a \geq 1$

$\therefore$ The possible values of a is 1

If $a = 1, |x| = 1 \Rightarrow x = \pm 1$

$\therefore$ The possible pairs =(-1,3), (1,3), (1,1), (-1,1), (2,2),(-2,2), (0,2) i.e., 7

[Option: 4]

Solution 59:

Let a, b, c represent number of students who opted for two subjects - Maths and Chemistry, Maths and Physics and Physics and Chemistry respectively.

Given, $a+b=23-18=5$

and $b+c=25-18=7$

Since a, b and c cannot be negative the least value for any of the three is 5 .

We get $a+c+18=(23+25-18)-2b$

Minimum value of number of students who chose chemistry $=23+25-18-10=20$

[Option: 1]

Solution 60:

$$\frac{x}{\sqrt{1+x^4}}=\frac{1}{\sqrt{\frac{1}{x^2}+x^2}}$$

$$x^2+\frac{1}{x^2}\geq 2$$

Hence the maximum value of $\frac{1}{\sqrt{\frac{1}{x^2}+x^2}}$ is $\frac{1}{\sqrt{2}}$

[Option: 3]

Solution 61:

Let the price of each pencil be Rs. x and price of each sharpens be Rs. y

Aron $y-x=2 \quad \Rightarrow \quad \therefore x=y-2$

$$a(y-2)+b(y)=2a(y-2)+(b-10)y$$

$$10y=a(y-2)\rightarrow(1)$$

Required value $=3a$

From (1) $a=\frac{10y}{y-2}a\in I^+$

Its possible only when $y=22$

$\therefore a=11$

Required answer =33

[Option: 2]

Solution 62:

Given ratio of shares of Amal and Sunil is 3: 2

Also the ratio of shares of Sunil and Mita is 4: 5 .

Hence the ratio of shares of Anil, Sunil and Mita is 6: 4: 5

$\therefore$ Sunil's share $=\frac{400\times 4}{2}=800$

[Answer: 800]

Solution 63:

Let the cost price and marked price of each toy be c and m respectively.

Overall selling price $=8(0.8m)+4\left(\frac{3}{4}\times 0.8m\right)$ i.e 8.8m.

Given, 110% of $12c=8.8m$

$\Rightarrow c=\frac{2m}{3}$

$\therefore$ Overall $CP=12\times\frac{2m}{3}$ i.e 8m

Required profit percentage $=\frac{12m-8m}{8m}\times 100=50\%$

[Option: 3]

Solution 64:

Time taken by each of them to complete one round

$$= \frac{\text{Circumference of the circle}}{\text{speed}}$$

Time taken for Ram to cover one round $= \frac{2\pi \times 100}{15 \times 5/18} = 48\pi$

Time taken for Rahim to cover one round $= \frac{2\pi \times 20}{5 \times 5/18} = 28.8\pi$

Time taken by Ram and Rahim meet each other for the first time $= LCM$ of 48π and $28.8\pi = 144\pi$

$\therefore$ Number of rounds made by Ram before he meets Rahim for the first time $= \frac{144\pi}{48\pi} = 3$

[Option: 2]

Solution 65:

Consider four blanks

7 is in thousand place, then 3 can be placed in any of the 3 places in 3 ways. Remaining two blanks can be filled with remaining eight digits in ${}^{8}P_{2}$ ways. The number of numbers that have 7 is in thousand place is $3 \times {}^{8}P_{2} = 168$

Thousand place cannot be 0,7 and 3, it can be filled with remaining 7 digits in 7 ways. In remaining 3 blanks, 7 and 3 can be arranged in 3 ways. Fourth blank can be filled in 7 ways. The number of numbers that are formed where 7 and 3 is not in thousand place is $7 \times 3 \times 7 = 147$. Hence total required numbers $= 168 + 147 = 315$.

[Answer: 315]

Solution 66:

$2x+5y=99$

When $y=-19, x=97;$ since $x \geq y$; the maximum value of y is 13 and corresponding value of x is 17 .

We know that the solutions of y are in arithmetic progression with common difference 2 .

Here $a=-19, d=2, tn=13$

$t_n = a+(n-1)d$

$-19+(n-1)(2)=13$

$(n-1)2=32 \Rightarrow n=17$

Hence number of pairs integers is 17

[Answer: 17]

Solution 67:

Given $x+9=z=y+1$ and $x+y<z+5$

$\Rightarrow (z-9)+(z-1)<z+5$

$\Rightarrow z<15$

Hence the maximum value of $z=14, \max$ of $x=5$ and $\max$ of $y=13$

Required answer, $2x+y=2\times5+13=23$

[Answer: 23]

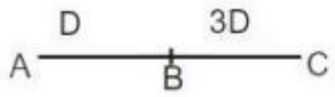
Solution 68:

Required ratio of speeds = Square root of inverse ratio of times taken after crossing each other. $=\sqrt{4}:\sqrt{1}$ i.e., 2: 1

[Option: 1]

Solution 69:

Given,



Let the speed of train 1 from A to B be s.

Then the speed of train 2 from A to B is 2s.

Time taken by train 1 to cover A to C $= \frac{D}{s} + \frac{3D}{2s} = \frac{5D}{2s}$

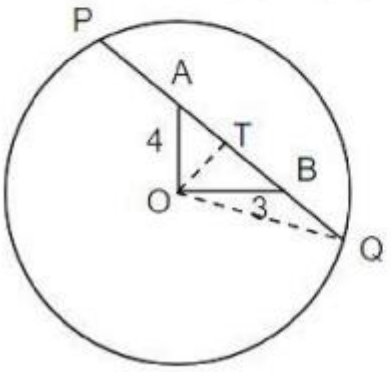
And, time taken by train 2 to cover A to C

$= \frac{D}{2s} + \frac{3D}{s} = \frac{7D}{2s}$

Required ratio $= \frac{5D}{2s} : \frac{7D}{2s} \Rightarrow 5:7$

[Option: 3]

Solution 70:



$AB = \sqrt{3^2 + 4^2} = 5$

$$OT = \frac{3\times 4}{5} = \frac{12}{5}$$

$$OT = 2.4M$$

In ΔOTQ

$$OQ^2 = OT^2 + TQ^2 \Rightarrow TQ^2 = OQ^2 - OT^2$$

$$= (5)^2 - (2.4)^2$$

=19.24

$$\Rightarrow TQ = \sqrt{19.24} \approx 4.4$$

$$\therefore PQ = 2TQ = 8.8m$$

[Option: 4]

Solution 71:

$$\left(x^2 - 5x + 7\right)^{x+1} = 1$$

We know, for $a^b = 1$, if

$-a = -1$ then b is even.

$-a = 1$ then b is any number

$-a > 0$ then $b = 0$

Case 1: $x + 1 = 0 \Rightarrow x = -1$

Case 2: $x^2 - 5x + 7 = 1 \Rightarrow x^2 - 5x + 6 = 0 \Rightarrow x = 2$ or 3

Case 3: $x^2 - 5x + 7 = -1 \Rightarrow x^2 - 5x + 8 = 0$

but x is not an integer

$\therefore$ The number of integers satisfies the equation is 3

[Option: 2]

Solution 72:

$f(x) = x^2 + ax + b$

$g(x) = f(x+1) - f(x-1)$

$= \{(x+1)^2 + a(x+1) + b\} - \{(x-1)^2 + a(x-1) + b\}$

$g(x) = 4x + 2a$

$g(20) = 72$

$80 + 2a = 72 \Rightarrow a = -4$

$\therefore f(x) = x^2 - 4x + b$

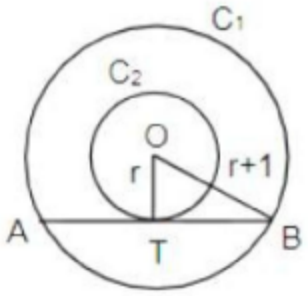
$f(x) = (x-2)^2 + b - 4$

when $b \geq 4 f(x) \geq 0$ for all x

$\therefore$ The minimum value of b is 4

[Option: 4]

Solution 73:



Given, $d+2=D \Rightarrow r+1=R$

In the figure $OT=r$ and $OB=r+1$

$OT \perp AB$ as AB is the tangent

OT bisects AB i.e., $TB=\frac{6}{2}=3$

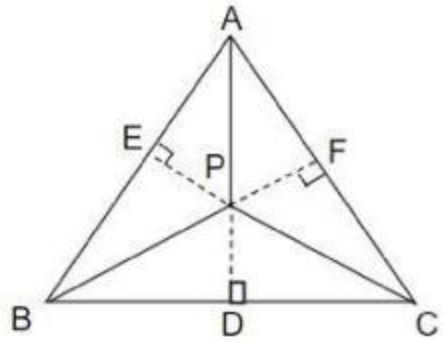
Now, in $\Delta OTB, OT^2+TB^2=OB^2$

$\therefore r^2+3^2=(r+1)^2 \Rightarrow r=4$

$\therefore D=2(R)=2(r+1)=10cm$

[Answer: 10]

Solution 74:



PD + PE + PF = s

Area of

$=\frac{1}{2}\times AB\times PE+\frac{1}{2}\times BC\times PD+\frac{1}{2}\times AC\times PF$

As $AB=BC=CA,$ we've

$$= \frac{1}{2} \times AB(PD + PE + PF) = \frac{1}{2} AB \times s - (1)$$

Now $\frac{\sqrt{3}}{4} AB^2 = \frac{1}{2} AB \times s$

$$\Rightarrow AB = \frac{2}{\sqrt{3}} s$$

Required value $= \frac{1}{2} \times \frac{2}{\sqrt{3}} \times s^2 = \frac{s^2}{\sqrt{3}}$

[Option: 2]

Solution 75:

Let the principal be P.

Given $\left(P \times \left(1 + \frac{5}{100} \right)^2 - P \right) - \left(\frac{P \times 3 \times 3}{100} \right) = 1125$

$$\Rightarrow P(0.1025 - 0.09) = 1125$$

$$\Rightarrow P = 90,000$$

[Answer: 90000]

Solution 76:

Let x_1 be the least number

x_{10} be the largest number

Given $\frac{x_2 + x_3 + \ldots + x_{10}}{9} = 47$

$$x_2 + x_3 + \cdots x_9 + x_{10} = 423 \rightarrow (1)$$

$$\frac{x_1 + x_2 \cdots + x_9}{9} = 42$$

$$x_1 + x_2 + \cdots x_9 = 378 \quad \rightarrow (2)$$

$$(1) - (2) = x_{10} - x_1 = 45$$

Sum of 10 observations

$$x_1 + x_2 + x_3 + \cdots x_{10} = 423 + x_1$$

Since the minimum value of x_{10} is 47, the minimum value of x_1 is 2, minimum average $= \frac{423+2}{10} = 42.5$

The maximum value of x_1 is 42 ,

Maximum average $= \frac{423+42}{10} = 46.5$

Required difference =4

[Option: 1]