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Dream, Aim, Achieve

Personal guidance center for CAT, GMAT preparation

CAT 2019 SLOT 1

Contact

VARC Section

As defined by the geographer Yi-Fu Tuan, topophilia is the affective bond between people and place. His 1974 book set forth a wide-ranging exploration of how the emotive ties with the material environment vary greatly from person to person and in intensity, subtlety, and mode of expression. Factors influencing one's depth of response to the environment include cultural background, gender, race, and historical circumstance, and Tuan also argued that there is a biological and sensory element. Topophilia might not be the strongest of human emotions— indeed, many people feel utterly indifferent toward the environments that shape their lives— but when activated it has the power to elevate a place to become the carrier of emotionally charged events or to be perceived as a symbol.

Aesthetic appreciation is one way in which people respond to the environment. A brilliantly colored rainbow after gloomy afternoon showers, a busy city street alive with human interaction—one might experience the beauty of such landscapes that had seemed quite ordinary only moments before or that are being newly discovered. This is quite the opposite of a second topophilic bond, namely that of the acquired taste for certain landscapes and places that one knows well. When a place is home, or when a space has become the locus of memories or the means of gaining a livelihood, it frequently evokes a deeper set of attachments than those predicated purely on the visual. A third response to the environment also depends on the human senses but may be tactile and olfactory, namely a delight in the feel and smell of air, water, and the earth.

Topophilia—and its very close conceptual twin, sense of place—is an experience that, however elusive, has inspired recent architects and planners. Most notably, new urbanism seeks to counter the perceived placelessness of modern suburbs and the decline of central cities through neo-traditional design motifs. Although motivated by good intentions, such attempts to create places rich in meaning are perhaps bound to disappoint. As Tuan noted, purely aesthetic responses often are suddenly revealed, but their intensity rarely is longlasting. Topophilia is difficult to design for and impossible to quantify, and its most articulate interpreters have been self-reflective philosophers such as Henry David Thoreau, evoking a marvelously intricate sense of place at Walden Pond, and Tuan, describing his deep affinity for the desert.

Topophilia connotes a positive relationship, but it often is useful to explore the darker affiliations between people and place. Patriotism, literally meaning the love of one's terrapatria or homeland, has long been cultivated by governing elites for a range of nationalist projects, including war preparation and ethnic cleansing. Residents of upscale residential developments have disclosed how important it is to maintain their community's distinct identity, often by casting themselves in a superior social position and by reinforcing class and racial differences. And just as a beloved landscape is suddenly revealed, so too may landscapes of fear cast a dark shadow over a place that makes one feel a sense of dread or anxiety—or topophobia.

Q. 1: The word "topophobia" in the passage is used:

1. to represent a feeling of dread towards particular spaces and places.

2. to signify the fear of studying the complex discipline of topography.

3. as a metaphor expressing the failure of the homeland to accommodate non-citizens.

4. to signify feelings of fear or anxiety towards topophilic people.

Q. 2: Which of the following statements, if true, could be seen as not contradicting the arguments in the passage?

1. The most important, even fundamental, response to our environment is our tactile and olfactory response.

2. Generally speaking, in a given culture, the ties of the people to their environment vary little in significance or intensity.

3. Patriotism, usually seen as a positive feeling, is presented by the author as a darker form of topophilia.

4. New Urbanism succeeded in those designs where architects collaborated with their clients.

Q. 3: In the last paragraph, the author uses the example of "Residents of upscale residential developments" to illustrate the:

1. introduction of nationalist projects by such elites to produce a sense of dread or topophobia.

2. social exclusivism practised by such residents in order to enforce a sense of racial or class superiority.

3. manner in which environments are designed to minimise the social exclusion of their clientele.

4. sensitive response to race and class problems in upscale residential developments.

Q. 4: Which one of the following best captures the meaning of the statement, "Topophilia is difficult to design for and impossible to quantify . . ."?

1. People's responses to their environment are usually subjective and so cannot be rendered in design.

2. The deep anomie of modern urbanisation led to new urbanism's intricate sense of place.

3. Architects have to objectively quantify spaces and hence cannot be topophilic.

4. Philosopher-architects are uniquely suited to develop topophilic design.

Q. 5: Which one of the following comes closest in meaning to the author's understanding of topophilia?

1. The tendency of many cultures to represent their land as "motherland" or "fatherland" may be seen as an expression of their topophilia

2. Nomadic societies are known to have the least affinity for the lands through which they traverse because they tend to be topophobic.

3. The French are not overly patriotic, but they will refuse to use English as far as possible, even when they know it well.

4. Scientists have found that most creatures, including humans, are either born with or cultivate a strong sense of topography.

"Free of the taint of manufacture" – that phrase, in particular, is heavily loaded with the ideology of what the Victorian socialist William Morris called the "anti-scrape", or an anticapitalist conservationism

(not conservatism) that solaced itself with the vision of a preindustrial golden age. In Britain, folk may often appear a cosy, fossilised form, but when you look more closely, the idea of folk – who has the right to sing it, dance it, invoke it, collect it, belong to it or appropriate it for political or cultural ends – has always been contested territory. . . .

In our own time, though, the word "folk" . . . has achieved the rare distinction of occupying fashionable and unfashionable status simultaneously. Just as the effusive floral prints of the radical William Morris now cover genteel sofas, so the revolutionary intentions of many folk historians and revivalists have led to music that is commonly regarded as parochial and conservative. And yet – as newspaper columns periodically rejoice – folk is hip again, influencing artists, clothing and furniture designers, celebrated at music festivals, awards ceremonies and on TV, reissued on countless record labels. Folk is a sonic "shabby chic", containing elements of the uncanny and eerie, as well as an antique veneer, a whiff of Britain's heathen dark ages. The very obscurity and anonymity of folk music's origins open up space for rampant imaginative fancies. . . .

[Cecil Sharp, who wrote about this subject, believed that] folk songs existed in constant transformation, a living example of an art form in a perpetual state of renewal. "One man sings a song, and then others sing it after him, changing what they do not like" is the most concise summary of his conclusions on its origins. He compared each rendition of a ballad to an acorn falling from an oak tree; every subsequent iteration sows the song anew. But there is tension in newness. In the late 1960s, purists were suspicious of folk songs recast in rock idioms. Electrification, however, comes in many forms. For the early-20th-century composers such as Vaughan Williams and Holst, there were thunderbolts of inspiration from oriental mysticism, angular modernism and the body blow of the first world war, as well as input from the rediscovered folk tradition itself.

For the second wave of folk revivalists, such as Ewan MacColl and AL Lloyd, starting in the 40s, the vital spark was communism's dream of a post-revolutionary New Jerusalem. For their younger successors in the 60s, who thronged the folk clubs set up by the old guard, the lyrical freedom of Dylan and the unchained melodies of psychedelia created the conditions for folkrock's own golden age, a brief Indian summer that lasted from about 1969 to 1971. . . . Four decades on, even that progressive period has become just one more era ripe for fashionable emulation and pastiche. The idea of a folk tradition being exclusively confined to oral transmission has become a much looser, less severely guarded concept. Recorded music and television, for today's metropolitan generation, are where the equivalent of folk memories are seeded. . . .

Q. 6: All of the following are causes for plurality and diversity within the British folk tradition EXCEPT:

1. paradoxically, folk forms are both popular and unpopular.

2. that British folk continues to have traces of pagan influence from the dark ages.

3. that British folk forms can be traced to the remote past of the country.

4. the fluidity of folk forms owing to their history of oral mode of transmission.

Q. 7: Which of the following statements about folk revivalism of the 1940s and 1960s cannot be inferred from the passage?

1. Even though it led to folk-rock's golden age, it wasn't entirely free from critique.

2. Electrification of music would not have happened without the influence of rock music.

3. Freedom and rebellion were popular themes during the second wave of folk revivalism.

4. It reinforced Cecil Sharp's observation about folk's constant transformation.

Q. 8: The author says that folk "may often appear a cosy, fossilised form" because:

1. it has been arrogated for various political and cultural purposes.

2. folk is a sonic "shabby chic" with an antique veneer.

3. the notion of folk has led to several debates and disagreements.

4. of its nostalgic association with a pre-industrial past.

Q. 9: The primary purpose of the reference to William Morris and his floral prints is to show:

1. the pervasive influence of folk on contemporary art, culture, and fashion.

2. that what was once derided as genteel is now considered revolutionary.

3. that what is once regarded as radical in folk, can later be seen as conformist.

4. that despite its archaic origins, folk continues to remain a popular tradition.

Q. 10: At a conference on folk forms, the author of the passage is least likely to agree with which one of the following views?

1. The power of folk resides in its contradictory ability to influence and be influenced by the present while remaining rooted in the past.

2. Folk forms, despite their archaic origins, remain intellectually relevant in contemporary times.

3. Folk forms, in their ability to constantly adapt to the changing world, exhibit an unusual poise and homogeneity with each change.

4. The plurality and democratising impulse of folk forms emanate from the improvisation that its practitioners bring to it.

Contemporary internet shopping conjures a perfect storm of choice anxiety. Research has consistently held that people who are presented with a few options make better, easier decisions than those presented with many. . . . Helping consumers figure out what to buy amid an endless sea of choice online has become a cottage industry unto itself. Many brands and retailers now wield marketing buzzwords such as curation, differentiation, and discovery as they attempt to sell an assortment of stuff targeted to their ideal customer. Companies find such shoppers through the data gold mine of digital advertising, which can catalog people by gender, income level, personal interests, and more. Since Americans have lost the ability to sort through the sheer volume of the consumer choices available to them, a ghost now has to be in the retail machine, whether it's an algorithm, an influencer, or some snazzy ad tech to help a product follow you around the internet. Indeed, choice fatigue is one reason so many people gravitate toward lifestyle influencers on Instagram—the relentlessly chic young moms and perpetually vacationing 20-somethings—who present an aspirational worldview, and then recommend the products and services that help achieve it. . . .

For a relatively new class of consumer-products start-ups, there's another method entirely. Instead of making sense of a sea of existing stuff, these companies claim to disrupt stuff as Americans know it. Casper (mattresses), Glossier (makeup), Away (suitcases), and many others have sprouted up to offer consumers freedom from choice: The companies have a few aesthetically pleasing and supposedly highly functional options, usually at mid-range prices. They're selling nice things, but maybe more importantly, they're selling a confidence in those things, and an ability to opt out of the stuff rat race. . .

One-thousand-dollar mattresses and $300 suitcases might solve choice anxiety for a certain tier of consumer, but the companies that sell them, along with those that attempt to massage the larger stuff economy into something navigable, are still just working within a consumer market that's broken in systemic ways. The presence of so much stuff in America might be more valuable if it were more evenly distributed, but stuff's creators tend to focus their energy on those who already have plenty. As options have expanded for people with disposable income, the opportunity to buy even basic things such as fresh food or quality diapers has contracted for much of America's lower classes.

For start-ups that promise accessible simplicity, their very structure still might eventually push them toward overwhelming variety. Most of these companies are based on hundreds of millions of dollars of venture capital, the investors of which tend to expect a steep growth rate that can't be achieved by selling one great mattress or one great sneaker. Casper has expanded into bedroom furniture and bed linens. Glossier, after years of marketing itself as no-makeup makeup that requires little skill to apply, recently launched a full line of glittering color cosmetics. There may be no way to opt out of stuff by buying into the right thing.

Q. 11: Which one of the following best sums up the overall purpose of the examples of Casper and Glossier in the passage?

1. They are facilitating a uniform distribution of commodities in the market.

2. They might transform into what they were exceptions to.

3. They are exceptions to a dominant trend in consumer markets.

4. They are increasing the purchasing power of poor Americans.

Q. 12: A new food brand plans to launch a series of products in the American market. Which of the following product plans is most likely to be supported by the author of the passage?

1. A range of 25 products priced between $10 and $25.

2. A range of 10 products priced between $5 and $10.

3. A range of 10 products priced between $10 and $25.

4. A range of 25 products priced between $5 and $10.

Q. 13: Based on the passage, all of the following can be inferred about consumer behavior EXCEPT that:

 1. too many options have made it difficult for consumers to trust products.

2. consumers tend to prefer products by start-ups over those by established companies.

3. having too many product options can be overwhelming for consumers.

4. consumers are susceptible to marketing images that they see on social media.

Q. 14: All of the following, IF TRUE, would weaken the author's claims EXCEPT:

1. product options increased market competition, bringing down the prices of commodities, which, in turn, increased purchasing power of the poor.

 2. the annual sales growth of companies with fewer product options were higher than that of companies which curated their products for target consumers.

3. the empowerment felt by purchasers in buying a commodity were directly proportional to the number of options they could choose from.

4. the annual sale of companies that hired lifestyle influencers on Instagram for marketing their products were 40% less than those that did not.

Q. 15: Which of the following hypothetical statements would add the least depth to the author's prediction of the fate of start-ups offering few product options?

1. With Casper and Glossier venturing into new product ranges, their regular customers start losing trust in the companies and their products.

2. Start-ups with few product options are no exception to the American consumer market that is deeply divided along class lines.

3. An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their product catalogue.

4. With the motive of promoting certain rival companies, the government decides to double the tax-rates for these start-ups.

In the past, credit for telling the tale of Aladdin has often gone to Antoine Galland . . . the first European translator of . . . Arabian Nights [which] started as a series of translations of an incomplete manuscript of a medieval Arabic story collection. . . But, though those tales were of medieval origin, Aladdin may be a more recent invention. Scholars have not found a manuscript of the story that predates the version published in 1712 by Galland, who wrote in his diary that he first heard the tale from a Syrian storyteller from Aleppo named Hanna Diyab . . .

Despite the fantastical elements of the story, scholars now think the main character may actually be based on a real person's real experiences. . . . Though Galland never credited Diyab in his published translations of the Arabian Nights stories, Diyab wrote something of his own: a travelogue penned in the mid-18th century. In it, he recalls telling Galland the story of Aladdin [and] describes his own hard-knocks upbringing and the way he marveled at the extravagance of Versailles. The descriptions he uses were very similar to the descriptions of the lavish palace that ended up in Galland's version of the Aladdin story. [Therefore, author Paulo Lemos] Horta believes that "Aladdin might be the young Arab Maronite from Aleppo, marveling at the jewels and riches of Versailles." . . .

For 300 years, scholars thought that the rags-to-riches story of Aladdin might have been inspired by the plots of French fairy tales that came out around the same time, or that the story was invented in that 18th century period as a byproduct of French Orientalism, a fascination with stereotypical exotic Middle Eastern luxuries that was prevalent then. The idea that Diyab might have based it on his own life — the

experiences of a Middle Eastern man encountering the French, not vice-versa — flips the script. [According to Horta,] "Diyab was ideally placed to embody the overlapping world of East and West, blending the storytelling traditions of his homeland with his youthful observations of the wonder of 18th-century France." . . .

To the scholars who study the tale, its narrative drama isn't the only reason storytellers keep finding reason to return to Aladdin. It reflects not only "a history of the French and the Middle East, but also [a story about] Middle Easterners coming to Paris and that speaks to our world today," as Horta puts it. "The day Diyab told the story of Aladdin to Galland, there were riots due to food shortages during the winter and spring of 1708 to 1709, and Diyab was sensitive to those people in a way that Galland is not. When you read this diary, you see this solidarity among the Arabs who were in Paris at the time. . . . There is little in the writings of Galland that would suggest that he was capable of developing a character like Aladdin with sympathy, but Diyab's memoir reveals a narrator adept at capturing the distinctive psychology of a young protagonist, as well as recognizing the kinds of injustices and opportunities that can transform the path of any youthful adventurer."

Q. 16: Which of the following does not contribute to the passage's claim about the authorship of Aladdin?

 1. The depiction of the affluence of Versailles in Diyab's travelogue.

2. The narrative sensibility of Diyab's travelogue.

3. The story-line of many French fairy tales of the 18th century.

4. Galland's acknowledgment of Diyab in his diary.

Q. 17: The author of the passage is most likely to agree with which of the following explanations for the origins of the story of Aladdin?

1. Basing it on his own life experiences, Diyab transmitted the story of Aladdin to Galland who included it in Arabian Nights.

2. Galland received the story of Aladdin from Diyab who, in turn, found it in an incomplete medieval manuscript.

3. The story of Aladdin has its origins in an undiscovered, incomplete manuscript of a medieval Arabic collection of stories.

4. Galland derived the story of Aladdin from Diyab's travelogue in which he recounts his fascination with the wealth of Versailles.

Q. 18: Which of the following is the primary reason for why storytellers are still fascinated by the story of Aladdin?

1. The story of Aladdin is evidence of the eighteenth century French Orientalist attitude.

2. The traveller's experience that inspired the tale of Aladdin resonates even today.

3. The tale of Aladdin documents the history of Europe and Middle East.

4. The archetype of the rags-to-riches story of Aladdin makes it popular even today.

Q. 19: All of the following serve as evidence for the character of Aladdin being based on Hanna Diyab EXCEPT:

1. Diyab's cosmopolitanism and cross-cultural experience.

2. Diyab's humble origins and class struggles, as recounted in his travelogue.

3. Diyab's narration of the original story to Galland.

4. Diyab's description of the wealth of Versailles in his travelogue.

Q. 20: Which of the following, if true, would invalidate the inversion that the phrase "flips the script" refers to?

1. Galland acknowledged in the published translations of Arabian Nights that he heard the story of Aladdin from Diyab.

2. Diyab's travelogue described the affluence of the French city of Bordeaux, instead of Versailles.

3. The French fairy tales of the eighteenth century did not have rags-to-riches plot lines like that of the tale of Aladdin.

4. The description of opulence in Hanna Diyab's and Antoine Galland's narratives bore no resemblance to each other.

Scientists recently discovered that Emperor Penguins—one of Antarctica's most celebrated species—employ a particularly unusual technique for surviving the daily chill. As detailed in an article published today in the journal Biology Letters, the birds minimize heat loss by keeping the outer surface of their plumage below the temperature of the surrounding air. At the same time, the penguins' thick plumage insulates their body and keeps it toasty. . . .

The researchers analyzed thermographic images . . . taken over roughly a month during June 2008. During that period, the average air temperature was 0.32 degrees Fahrenheit. At the same time, the majority of the plumage covering the penguins' bodies was even colder: the surface of their warmest body part, their feet, was an average 1.76 degrees Fahrenheit, but the plumage on their heads, chests and backs were -1.84, -7.24 and -9.76 degrees Fahrenheit respectively. Overall, nearly the entire outer surface of the penguins' bodies was below freezing at all times, except for their eyes and beaks. The scientists also used a computer simulation to determine how much heat was lost or gained from each part of the body—and discovered that by keeping their outer surface below air temperature, the birds might paradoxically be able to draw very slight amounts of heat from the air around them. The key to their trick is the difference between two different types of heat transfer: radiation and convection.

The penguins do lose internal body heat to the surrounding air through thermal radiation, just as our bodies do on a cold day. Because their bodies (but not surface plumage) are warmer than the surrounding air, heat gradually radiates outward over time, moving from a warmer material to a colder one. To maintain body temperature while losing heat, penguins, like all warm-blooded animals, rely on the metabolism of food. The penguins, though, have an additional strategy. Since their outer plumage is even colder than the air, the simulation showed that they might gain back a little of this heat through thermal convection—the transfer of heat via the movement of a fluid (in this case, the air). As the cold Antarctic air cycles around their bodies, slightly warmer air comes into contact with the plumage and

donates minute amounts of heat back to the penguins, then cycles away at a slightly colder temperature.

Most of this heat, the researchers note, probably doesn't make it all the way through the plumage and back to the penguins' bodies, but it could make a slight difference. At the very least, the method by which a penguin's plumage wicks heat from the bitterly cold air that surrounds it helps to cancel out some of the heat that's radiating from its interior. And given the Emperors' unusually demanding breeding cycle, every bit of warmth counts. . . . Since [penguins trek as far as 75 miles to the coast to breed and male penguins] don't eat anything during [the incubation period of 64 days], conserving calories by giving up as little heat as possible is absolutely crucial.

Q. 21: In the last sentence of paragraph 3, "slightly warmer air" and "at a slightly colder temperature" refer to _____ AND _____ respectively:

1. the air inside penguins' bodies kept warm because of metabolism of food AND the fall in temperature of the body air after it transfers some heat to the plumage.

2. the cold Antarctic air whose temperature is higher than that of the plumage AND the fall in temperature of the Antarctic air after it has transmitted some heat to the plumage.

3. the air trapped in the plumage which is warmer than the Antarctic air AND the fall in temperature of the trapped plumage air after it radiates out some heat.

4. the cold Antarctic air which becomes warmer because of the heat radiated out from penguins' bodies AND the fall in temperature of the surrounding air after thermal convection.

Q. 22: Which of the following best explains the purpose of the word "paradoxically" as used by the author?

1. Keeping a part of their body colder helps penguins keep their bodies warmer.

2. Heat loss through radiation happens despite the heat gain through convection.

3. Keeping their body colder helps penguins keep their plumage warmer.

4. Heat gain through radiation happens despite the heat loss through convection.

Q. 23: Which of the following can be responsible for Emperor Penguins losing body heat?

1. Reproduction process.

2. Thermal convection.

3. Food metabolism.

4. Plumage.

Q. 24: All of the following, if true, would negate the findings of the study reported in the passage EXCEPT:

1. the average air temperature recorded during the month of June 2008 in the area of study were –10 degrees Fahrenheit.

2. the average temperature of the feet of penguins in the month of June 2008 were found to be 2.76 degrees Fahrenheit.

3. the temperature of the plumage on the penguins' heads, chests and backs were found to be 1.84, 7.24 and 9.76 degrees Fahrenheit respectively.

4. the penguins' plumage were made of a material that did not allow any heat transfer through convection or radiation.

Q. 25: The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. People with dyslexia have difficulty with print-reading, and people with autism spectrum disorder have difficulty with mind-reading.

2. An example of a lost cognitive instinct is mind-reading: our capacity to think of ourselves and others as having beliefs, desires, thoughts and feelings.

3. Mind-reading looks increasingly like literacy, a skill we know for sure is not in our genes, since scripts have been around for only 5,000-6,000 years.

4. Print-reading, like mind-reading varies across cultures, depends heavily on certain parts of the brain, and is subject to developmental disorders.

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

1. Metaphors may map to similar meanings across languages, but their subtle differences can have a profound effect on our understanding of the world.

2. Latin scholars point out carpe diem is a horticultural metaphor that, particularly seen in the context of its source, is more accurately translated as "plucking the day," evoking the plucking and gathering of ripening fruits or flowers, enjoying a moment that is rooted in the sensory experience of nature, unrelated to the force implied in seizing.

3. The phrase carpe diem, which is often translated as "seize the day and its accompanying philosophy, has gone on to inspire countless people in how they live their lives and motivates us to see the world a little differently from the norm

4. It's an example of one of the more telling ways that we mistranslate metaphors from one language to another, revealing in the process our hidden assumptions about what we really value.

Q. 27: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. One argument is that actors that do not fit within a single, well-defined category may suffer an "illegitimacy discount".

2. Others believe that complex identities confuse audiences about an organization's role or purpose.

3. Some organizations have complex and multidimensional identities that span or combine categories, while other organizations possess narrow identities.

4. Identity is one of the most important features of organizations, but there exist opposing views among sociologists about how identity affects organizational performance.

5. Those who think that complex identities are beneficial point to the strategic advantages of ambiguity, and organizations' potential to differentiate themselves from competitors.

Q. 28: The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. If you've seen a little line of text on websites that says something like "customers who bought this also enjoyed that" you have experienced this collaborative filtering firsthand.

2. The problem with these algorithms is that they don't take into account a host of nuances and circumstances that might interfere with their accuracy.

3. If you just bought a gardening book for your cousin, you might get a flurry of links to books about gardening, recommended just for you! – the algorithm has no way of knowing you hate gardening and only bought the book as a gift.

4. Collaborative filtering is a mathematical algorithm by which correlations and cooccurrences of behaviors are tracked and then used to make recommendations.

Q. 29: The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

1. We'll all live under mob rule until then, which doesn't help anyone.

2. Perhaps we need to learn to condense the feedback we receive online so that 100 replies carry the same weight as just one.

3. As we grow more comfortable with social media conversations being part of the way we interact every day, we are going to have to learn how to deal with legitimate criticism.

4. A new norm will arise where it is considered unacceptable to reply with the same point that dozens of others have already.

Q. 30: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage. A distinguishing feature of language is our ability to refer to absent things, known as displaced reference. A speaker can bring distant referents to mind in the absence of any obvious stimuli. Thoughts, not limited to the here and now, can pop into our heads for unfathomable reasons. This ability to think about distant things necessarily precedes the ability to talk about them. Thought precedes meaningful referential communication. A prerequisite for the emergence of human-like meaningful symbols is that the mental categories they relate to can be invoked even in the absence of immediate stimuli.

1. Thoughts are essential to communication and only humans have the ability to think about objects not present in their surroundings.

2. The ability to think about objects not present in our environment precedes the development of human communication.

3. Displaced reference is particular to humans and thoughts pop into our heads for no real reason.

4. Thoughts precede all speech acts and these thoughts pop up in our heads even in the absence of any stimulus.

Q. 31: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Physics is a pure science that seeks to understand the behaviour of matter without regard to whether it will afford any practical benefit. Engineering is the correlative applied science in which physical theories are put to some specific use, such as building a bridge or a nuclear reactor. Engineers obviously rely heavily on the discoveries of physicists, but an engineer's knowledge of the world is not the same as the physicist's knowledge. In fact, an engineer's know-how will often depend on physical theories that, from the point of view of pure physics, are false. There are some reasons for this. First, theories that are false in the purest and strictest sense are still sometimes very good approximations to the true ones, and often have the added virtue of being much easier to work with. Second, sometimes the true theories apply only under highly idealized conditions which can only be created under controlled experimental situations. The engineer finds that in the real world, theories rejected by physicists yield more accurate predictions than the ones that they accept.

1. The relationship between pure and applied science is strictly linear, with the pure science directing applied science, and never the other way round.

2. Though engineering draws heavily from pure science, it contributes to knowledge, by incorporating the constraints and conditions in the real world.

 3. The unique task of the engineer is to identify, understand, and interpret the design constraints to produce a successful result.

4. Engineering and physics fundamentally differ on matters like building a bridge or a nuclear reactor.

Q. 32: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Vance Packard's The Hidden Persuaders alerted the public to the psychoanalytical techniques used by the advertising industry. Its premise was that advertising agencies were using depth interviews to identify hidden consumer motivations, which were then used to entice consumers to buy goods. Critics and reporters often wrongly assumed that Packard was writing mainly about subliminal advertising. Packard never mentioned the word subliminal, however, and devoted very little space to discussions of "subthreshold" effects. Instead, his views largely aligned with the notion that individuals do not always have access to their conscious thoughts and can be persuaded by supraliminal messages without their knowledge.

1. Packard argued that advertising as a 'hidden persuasion' understands the hidden motivations of consumers and works at the subliminal level, on the subconscious level of the awareness of the people targeted.

2. Packard argued that advertising as a 'hidden persuasion' works at the supraliminal level, wherein the people targeted are aware of being persuaded, after understanding the hidden motivations of consumers and works.

3. Packard held that advertising as a 'hidden persuasion' builds on peoples' conscious thoughts and awareness, by understanding the hidden motivations of consumers and works at the subliminal level.

4. Packard held that advertising as a 'hidden persuasion' understands the hidden motivations of consumers and works at the supraliminal level, though the people targeted have no awareness of being persuaded.

Q. 33: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. His idea to use sign language was not a completely new idea as Native Americans used hand gestures to communicate with other tribes.

2. Ancient Greek philosopher Aristotle, for example, observed that men who are deaf are incapable of speech.

3. People who were born deaf were denied the right to sign a will as they were "presumed to understand nothing; because it is not possible that they have been able to learn to read or write."

4. Pushback against this prejudice began in the 16th century when Pedro Ponce de León created a formal sign language for the hearing impaired.

5. For millennia, people with hearing impairments encountered marginalization because it was believed that language could only be learned by hearing the spoken word.

Q. 34: Five sentences related to a topic are given below in a jumbled order. Four of them form a coherent and unified paragraph. Identify the odd sentence that does not go with the four. Key in the number of the option that you choose.

1. 'Stat' signaled something measurable, while 'matic' advertised free labour; but 'tron', above all, indicated control.

2. It was a totem of high modernism, the intellectual and cultural mode that decreed no process or phenomenon was too complex to be grasped, managed and optimized.

3. Like the heraldic shields of ancient knights, these morphemes were painted onto the names of scientific technologies to proclaim one's history and achievements to friends and enemies alike.

4. The historian Robert Proctor at Stanford University calls the suffix '-tron', along with '-matic' and '-stat', embodied symbols.

5. To gain the suffix was to acquire a proud and optimistic emblem of the electronic and atomic age.

Logical Reasoning and Data Interpretation

The following table represents addition of two six-digit numbers given in the first and the second rows, while the sum is given in the third row. In the representation, each of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 has been coded with one letter among A, B, C, D, E, F, G,H, J, K, with distinct letters representing distinct digits.

		B	H	A	A	G	F
+		A	H	J	F	K	F
	A	A	F	G	C	A	F

Q. 35: Which digit does the letter A represent?

Q. 36: Which digit does the letter B represent?

Q. 37: Which among the digits 3, 4, 6 and 7 cannot be represented by the letter D?

Q. 38: Which among the digits 4, 6, 7 and 8 cannot be represented by the letter G?

Princess, Queen, Rani and Samragni were the four finalists in a dance competition. Ashman, Badal, Gagan and Dyu were the four music composers who individually assigned items to the dancers. Each dancer had to individually perform in two dance items assigned by the different composers. The first items performed by the four dancers were all assigned by different music composers. No dancer

performed her second item before the performance of the first item by any other dancers. The dancers performed their second items in the same sequence of their performance of their first items.

The following additional facts are known.

i. No composer who assigned item to Princess, assigned any item to Queen.

ii. No composer who assigned item to Rani, assigned any item to Samragni.

iii. The first performance was by Princess; this item was assigned by Badal.

iv. The last performance was by Rani; this item was assigned by Gagan.

v. The items assigned by Ashman were performed consecutively. The number of performances between items assigned by each of the remaining composers was the same.

Q. 39: Which of the following is true?

1. The second performance was composed by Dyu.

 2. The third performance was composed by Ashman.

3. The second performance was composed by Gagan.

4. The third performance was composed by Dyu.

Q. 40: Which of the following is FALSE?

1. Queen did not perform in any item composed by Gagan.

2. Rani did not perform in any item composed by Badal.

3. Samragni did not perform in any item composed by Ashman.

4. Princess did not perform in any item composed by Dyu.

Q. 41: The sixth performance was composed by:

1. Gagan

2. Ashman

3. Badal

4. Dyu

Q. 42: Which pair of performances were composed by the same composer?

1. The first and the sixth

 2. The second and the sixth

3. The first and the seventh

4. The third and the seventh

Five vendors are being considered for a service. The evaluation committee evaluated each vendor on six aspects – Cost, Customer Service, Features, Quality, Reach, and Reliability. Each of these evaluations are on a scale of 0 (worst) to 100 (perfect). The evaluation scores on these aspects are shown in the radar chart. For example, Vendor 1 obtains a score of 52 on Reliability, Vendor 2 obtains a score of 45 on Features and Vendor 3 obtains a score of 90 on Cost.
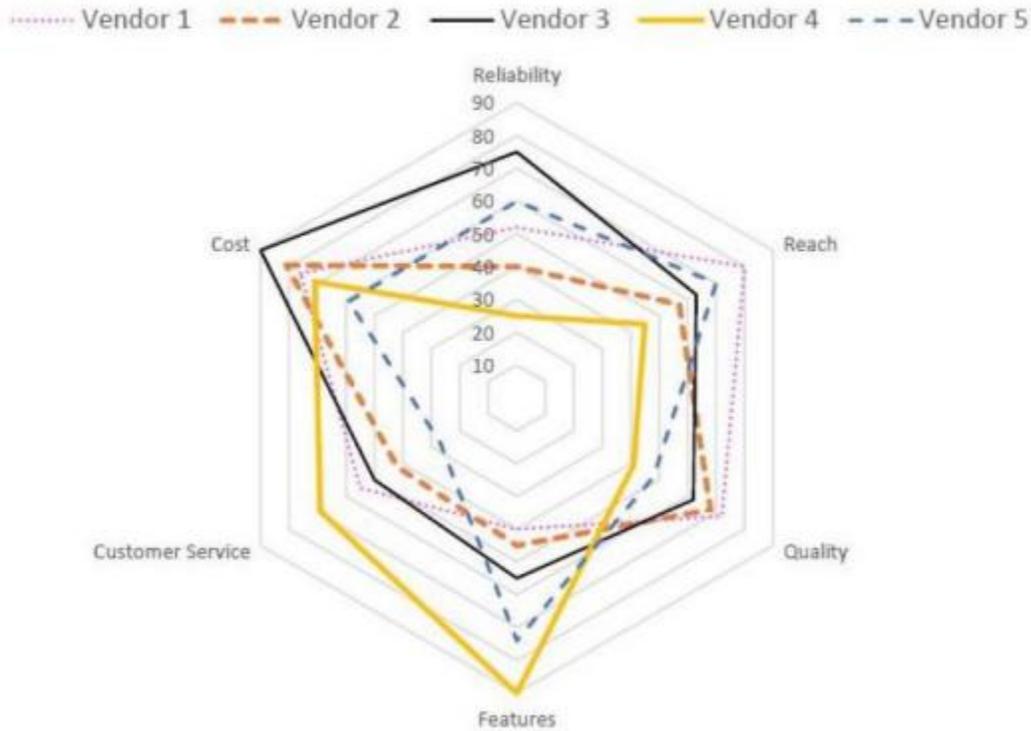
Q. 43: On which aspect is the median score of the five vendors the least?

1. Customer Service

2. Reliability

3. Cost

4. Quality

Q. 44: A vendor's final score is the average of their scores on all six aspects. Which vendor has the highest final score?

1. Vendor 1

2. Vendor 2

 3. Vendor 4

4. Vendor 3

Q. 45: List of all the vendors who are among the top two scorers on the maximum number of aspects is:

1. Vendor 1 and Vendor 5

2. Vendor 2, Vendor 3 and Vendor 4

3. Vendor 2 and Vendor 5

4. Vendor 1 and Vendor 2

Q. 46: List of all the vendors who are among the top three vendors on all six aspects is:

1. Vendor 1

2. Vendor 1 and Vendor 3

3. Vendor 3

4. None of the Vendors

Six players – Tanzi, Umeza, Wangdu, Xyla, Yonita and Zeneca competed in an archery tournament. The tournament had three compulsory rounds, Rounds 1 to 3. In each round every player shot an arrow at a target. Hitting the centre of the target (called bull's eye) fetched the highest score of 5. The only other possible scores that a player could achieve were 4, 3, 2 and 1. Every bull's eye score in the first three rounds gave a player one additional chance to shoot in the bonus rounds, Rounds 4 to 6. The possible scores in Rounds 4 to 6 were identical to the first three.

A player's total score in the tournament was the sum of his/her scores in all rounds played by him/her. The table below presents partial information on points scored by the players after completion of the tournament. In the table, NP means that the player did not participate in that round, while a hyphen means that the player participated in that round and the score information is missing.

	Round-1	Round-2	Round-3	Round-4	Round-5	Round-6
Tanzi	-	4	-	5	NP	NP
Umeza	-	-	-	1	2	NP
Wangdu	-	4	-	NP	NP	NP
Xyla	-	-	-	1	5	-
Yonita	-	-	3	5	NP	NP
Zeneca	-	-	-	5	5	NP

The following facts are also known.

1. Tanzi, Umeza and Yonita had the same total score.

2. Total scores for all players, except one, were in multiples of three.

3. The highest total score was one more than double of the lowest total score.

4. The number of players hitting bull's eye in Round 2 was double of that in Round 3.

5. Tanzi and Zeneca had the same score in Round 1 but different scores in Round 3.

Q. 47: What was the highest total score?

1. 24

2. 21

3. 25

4. 23

Q. 48: What was Zeneca's total score?

1. 22

2. 23

3. 21

4. 24

Q. 49: Which of the following statements is true?

1. Zeneca's score was 23.

2. Xyla was the highest scorer.

3. Zeneca was the highest scorer.

4. Xyla's score was 23.

Q. 50: What was Tanzi's score in Round 3?

1. 4

2. 3

3. 1

4. 5

The figure below shows the street map for a certain region with the street intersections marked from a through l. A person standing at an intersection can see along straight lines to other intersections that are in her line of sight and all other people standing at these intersections. For example, a person standing at intersection g can see all people standing at intersections b, c, e, f, h, and k. In particular, the person standing at intersection g can see the person standing at intersection e irrespective of whether there is a person standing at intersection f.
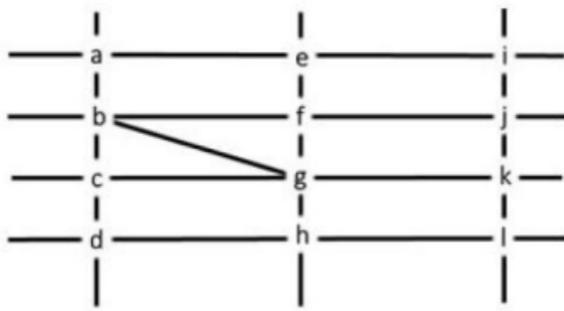
Six people U, V, W, X, Y, and Z, are standing at different intersections. No two people are standing at the same intersection.

The following additional facts are known.

1. X, U, and Z are standing at the three corners of a triangle formed by three street segments.
2. X can see only U and Z.
3. Y can see only U and W.
4. U sees V standing in the next intersection behind Z.
5. W cannot see V or Z.
6. No one among the six is standing at intersection d.

Q. 51: Who is standing at intersection a?

1. No one

 2. V

3. W

4. Y

Q. 52: Who can V see?

1. U only

2. U, W and Z only

3. U and Z only

4. Z only

Q. 53: What is the minimum number of street segments that X must cross to reach Y?

 1. 2

2. 3

3. 1

4. 4

Q. 54: Should a new person stand at intersection d, who among the six would she see?

1. U and Z only

2. V and X only

3. W and X only

4. U and W only

The Ministry of Home Affairs is analysing crimes committed by foreigners in different states and union territories (UT) of India. All cases refer to the ones registered against foreigners in 2016. The number of cases – classified into three categories: IPC crimes, SLL crimes and other crimes – for nine states/UTs are shown in the figure below. These nine belong to the top ten states/UTs in terms of the total number of cases registered. The remaining state (among top ten) is West Bengal, where all the 520 cases registered were SLL crimes.
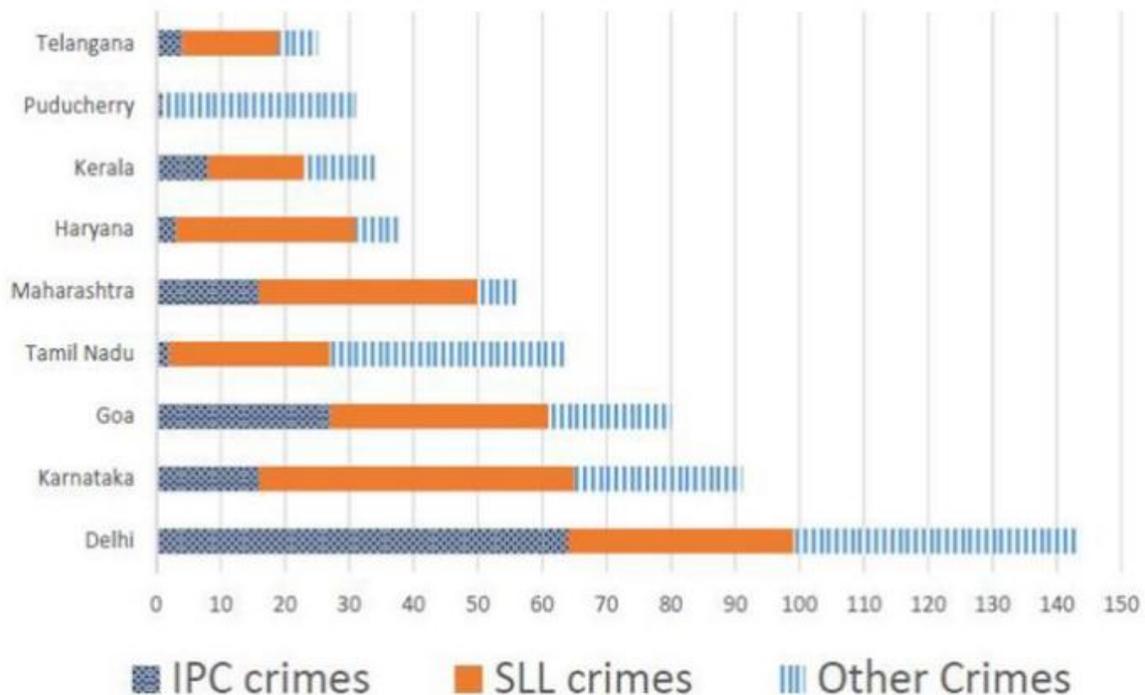
The table below shows the ranks of the ten states/UTs mentioned above among ALL states/UTs of India in terms of the number of cases registered in each of the three category of crimes. A state/UT is given rank r for a category of crimes if there are (r€•1) states/UTs having a larger number of cases registered in that category of crimes. For example, if two states have the same number of cases in a category, and

exactly three other states/UTs have larger numbers of cases registered in the same category, then both the states are given rank 4 in that category. Missing ranks in the table are denoted by *.

	IPC crimes	SLL crimes	Other Crimes
Delhi	*	*	*
Goa	*	4	*
Haryana	8	6	*
Karnataka	3	2	*
Kerala	*	9	*
Maharashtra	3	4	8
Puducherry	13	29	*
Tamil Nadu	11	7	*
Telangana	6	9	8
West Bengal	17	*	16

Q. 55: What is the rank of Kerala in the 'IPC crimes' category?

Q. 56: In the two states where the highest total number of cases are registered, the ratio of the total number of cases in IPC crimes to the total number in SLL crimes is closest to

1. 1:9

2. 11:10

3. 3:2

4. 19:20

Q. 57: Which of the following is DEFINITELY true about the ranks of states/UT in the 'other crimes' category?

 i) Tamil Nadu: 2

ii) Puducherry: 3

1. both i) and ii)

2. neither i) , nor ii)

3. only ii)

4. only i)

Q. 58: What is the sum of the ranks of Delhi in the three categories of crimes?

A new game show on TV has 100 boxes numbered 1, 2, . . . , 100 in a row, each containing a mystery prize. The prizes are items of different types, a, b, c, . . . , in decreasing order of value. The most expensive item is of type a, a diamond ring, and there is exactly one of these. You are told that the number of items at least doubles as you move to the next type. For example, there would be at least twice as many items of type b as of type a, at least twice as many items of type c as of type b and so on. There is no particular order in which the prizes are placed in the boxes.

Q. 59: What is the minimum possible number of different types of prizes?

Q. 60: What is the maximum possible number of different types of prizes?

Q. 61: Which of the following is not possible?

1. There are exactly 30 items of type b.

2. There are exactly 45 items of type c.

3. There are exactly 75 items of type e.

4. There are exactly 60 items of type d.

Q. 62: You ask for the type of item in box 45. Instead of being given a direct answer, you are told that there are 31 items of the same type as box 45 in boxes 1 to 44 and 43 items of the same type as box 45 in boxes 46 to 100.

What is the maximum possible number of different types of items?

1. 6

2. 3

3. 5

4. 4

A supermarket has to place 12 items (coded A to L) in shelves numbered 1 to 16. Five of these items are types of biscuits, three types of candies and the rest are types of savouries. Only one item can be kept in a shelf. Items are to be placed such that all items of same type are clustered together with no empty shelf between items of the same type and at least one empty shelf between two different types of items. At most two empty shelves can have consecutive numbers.

The following additional facts are known.

1. A and B are to be placed in consecutively numbered shelves in increasing order

2. I and J are to be placed in consecutively numbered shelves both higher numbered than the shelves in which A and B are kept.

3. D, E and F are savouries and are to be placed in consecutively numbered shelves in increasing order after all the biscuits and candies.

4. K is to be placed in shelf number 16.

5. L and J are items of the same type, while H is an item of a different type.

6. C is a candy and is to be placed in a shelf preceded by two empty shelves.

7. L is to be placed in a shelf preceded by exactly one empty shelf.

Q. 63: In how many different ways can the items be arranged on the shelves?

1. 2

2. 8

3. 4

 4. 1

Q. 64: Which of the following items is not a type of biscuit?

1. G

2. B

3. L

4. A

Q. 65: Which of the following can represent the numbers of the empty shelves in a possible arrangement?

1. 1,7,11,12

2. 1,5,6,12

3. 1,2,6,12

4. 1,2,8,12

Q. 66: Which of the following statements is necessarily true?

1. There are two empty shelves between the biscuits and the candies.

2. All biscuits are kept before candies.

3. There are at least four shelves between items

4. All candies are kept before biscuits.

Quantitative Ability

Q. 67: If m and n are integers such that $(\sqrt{2})^{19}3^4 4^2 9^m 8^n = 3^n 16^m (\sqrt[4]{64})$ then m is

1. −20
2. −12
3. −24
4. −16

Q. 68: The income of Amala is 20% more than that of Bimala and 20% less than that of Kamala. If Kamala's income goes down by 4% and Bimala's goes up by 10%, then the percentage by which Kamala's income would exceed Bimala's is nearest to

1. 31
2. 28
3. 32
4. 29

Q. 69: In a class, 60% of the students are girls and the rest are boys. There are 30 more girls than boys. If 68% of the students, including 30 boys, pass an examination, the percentage of the girls who do not pass is

Q. 70: On selling a pen at 5% loss and a book at 15% gain, Karim gains Rs. 7. If he sells the pen at 5% gain and the book at 10% gain, he gains Rs. 13. What is the cost price of the book in Rupees?

1. 80

2. 85

3. 95

4. 100

Q. 71: Corners are cut off from an equilateral triangle T to produce a regular hexagon H. Then, the ratio of the area of H to the area of T is

1. 5: 6

2. 4: 5

3. 3: 4

4. 2: 3

Q. 72: Let S be the set of all points (x, y) in the x-y plane such that $|x| + |y| \le 2$ and $|x| \ge 1$. Then, the area, in square units, of the region represented by S equals

Q. 73: Ramesh and Gautam are among 22 students who write an examination. Ramesh scores 82.5. The average score of the 21 students other than Gautam is 62. The average score of all the 22 students is one more than the average score of the 21 students other than Ramesh. The score of Gautam is

1. 49

2. 48

3. 51

4. 53

Q. 74: At their usual efficiency levels, A and B together finish a task in 12 days. If A had worked half as efficiently as she usually does, and B had worked thrice as efficiently as he usually does, the task would have been completed in 9 days. How many days would A take to finish the task if she works alone at her usual efficiency?

1. 24

2. 18

3. 12

4. 36

Q. 75: If $a_1, a_2, \ldots$ are in A.P., then, $\dfrac{1}{\sqrt{a_1}+\sqrt{a_2}}+\dfrac{1}{\sqrt{a_2}+\sqrt{a_3}}+\cdots+\dfrac{1}{\sqrt{a_n}+\sqrt{a_{n+1}}}$ is equal to

1. $\dfrac{n-1}{\sqrt{a_1}+\sqrt{a_{n-1}}}$

2. $\dfrac{n}{\sqrt{a_1}+\sqrt{a_{n+1}}}$

3. $\dfrac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$

4. $\dfrac{n}{\sqrt{a_1}-\sqrt{a_{n+1}}}$

Q. 76: In a circle of radius 11 cm, CD is a diameter and AB is a chord of length 20.5 cm. If AB and CD intersect at a point E inside the circle and CE has length 7 cm, then the difference of the lengths of BE and AE, in cm, is

1. 2.5
2. 3.5
3. 0.5
4. 1.5

Q. 77: With rectangular axes of coordinates, the number of paths from (1,1) to (8,10) via (4,6), where each step from any point (x, y) is either to (x, y+1) or to (x+1, y), is

Q. 78: Amala, Bina, and Gouri invest money in the ratio 3 : 4 : 5 in fixed deposits having respective annual interest rates in the ratio 6 : 5 : 4. What is their total interest income (in Rs) after a year, if Bina's interest income exceeds Amala's by Rs 250?

1. 6350

2. 7250

3. 7000

4. 6000

Q. 79: A club has 256 members of whom 144 can play football, 123 can play tennis, and 132 can play cricket. Moreover, 58 members can play both football and tennis, 25 can play both cricket and tennis, while 63 can play both football and cricket. If every member can play at least one game, then the number of members who can play only tennis is

1. 45

2. 38

3. 32

4. 43

Q. 80: Let T be the triangle formed by the straight line 3x + 5y - 45 = 0 and the coordinate axes. Let the circumcircle of T have radius of length L, measured in the same unit as the coordinate axes. Then, the integer closest to L is

Q. 81: Three men and eight machines can finish a job in half the time taken by three machines and eight men to finish the same job. If two machines can finish the job in 13 days, then how many men can finish the job in 13 days?

Q. 82: Two cars travel the same distance starting at 10:00 am and 11:00 am, respectively, on the same day. They reach their common destination at the same point of time. If the first car travelled for at least 6 hours, then the highest possible value of the percentage by which the speed of the second car could exceed that of the first car is

1. 30

2. 25

3. 10

4. 20

Q. 83: If $(5.55)^x = (0.555)^y = 1000,$ then the value of $\dfrac{1}{x} - \dfrac{1}{y}$ is

1. 3
2. 1
3. $\dfrac{1}{3}$
4. $\dfrac{2}{3}$

Q. 84: The product of the distinct roots of $\left| x^2 - x - 6 \right| = x + 2$ is

1. -8
2. -24
3. -4
4. -16

Q. 85: The wheels of bicycles A and B have radii 30 cm and 40 cm, respectively. While traveling a certain distance, each wheel of A required 5000 more revolutions than each wheel of B. If bicycle B traveled this distance in 45 minutes, then its speed, in km per hour, was

1. 18π

2. 12π

3. 16π

4. 14π

Q. 86: AB is a diameter of a circle of radius 5 cm. Let P and Q be two points on the circle so that the length of PB is 6 cm, and the length of AP is twice that of AQ. Then the length, in cm, of QB is nearest to

1. 7.8

2. 8.5

3. 9.1

4. 9.3

Q. 87: For any positive integer n, let f(n) = n(n + 1) if n is even, and f(n) = n + 3 if n is odd. If m is a positive integer such that 8f(m + 1) - f(m) = 2, then m equals

Q. 88: A chemist mixes two liquids 1 and 2. One litre of liquid 1 weighs 1 kg and one litre of liquid 2 weighs 800 gm. If half litre of the mixture weighs 480 gm, then the percentage of liquid 1 in the mixture, in terms of volume, is

1. 85

2. 70

3. 75

4. 80

Q. 89: If $a_1 + a_2 + a_3 + \ldots + a_n = 3\left(2^{n+1} - 2\right)$, for every $n \geq 1$, then a_{11} equals

Q. 90: Consider a function f satisfying $f(x+y) = f(x)f(y)$ where x, y are positive integers, and $f(1) = 2$. If $f(a+1) + f(a+2) + \ldots + f(a+n) = 16\left(2^n - 1\right)$ then a is equal to

Q. 91: The number of the real roots of the equation $2\cos(x(x+1)) = 2^x + 2^{-x}$ is

1. 2
2. 1
3. infinite
4. 0

Q. 92: Let x and y be positive real numbers such that $\log_5(x+y) + \log_5(x-y) = 3$, and $\log_2 y - \log_2 x = 1 - \log_2 3$. Then xy equals

1. 250
2. 25
3. 100
4. 150

Q. 93: One can use three different transports which move at 10, 20, and 30 kmph, respectively. To reach from A to B, Amal took each mode of transport 1/3 of his total journey time, while Bimal took each mode of transport 1/3 of the total distance. The percentage by which Bimal's travel time exceeds Amal's travel time is nearest to

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

Q. 94: If the rectangular faces of a brick have their diagonals in the ratio $3 : 2\sqrt{3} : \sqrt{15}$, then the ratio of the length of the shortest edge of the brick to that of its longest edge is

1. $\sqrt{3} : 2$
2. $2 : \sqrt{5}$
3. $1 : \sqrt{3}$
4. $\sqrt{2} : \sqrt{3}$

Q. 95: If the population of a town is p in the beginning of any year then it becomes 3+2p in the beginning of the next year. If the population in the beginning of 2019 is 1000, then the population in the beginning of 2034 will be

1. $(997)2^{14} + 3$
2. $(1003)^{15} + 6$
3. $(1003)2^{15} - 3$
4. $(997)^{15} - 3$

Q. 96: A person invested a total amount of Rs 15 lakh. A part of it was invested in a fixed deposit earning 6% annual interest, and the remaining amount was invested in two other deposits in the ratio 2 : 1, earning annual interest at the rates of 4% and 3%, respectively. If the total annual interest income is Rs 76000 then the amount (in Rs lakh) invested in the fixed deposit was

Q. 97: Meena scores 40% in an examination and after review, even though her score is increased by 50%, she fails by 35 marks. If her post-review score is increased by 20%, she will have 7 marks more than the passing score. The percentage score needed for passing the examination is

1. 70

2. 60

3. 75

4. 80

Q. 98: In a race of three horses, the first beat the second by 11 metres and the third by 90 metres. If the second beat the third by 80 metres, what was the length, in metres, of the racecourse?

Q. 99: The number of solutions to the equation $|x|(6x^2 + 1) = 5x^2$ is

Q. 100: The product of two positive numbers is 616. If the ratio of the difference of their cubes to the cube of their difference is 157:3, then the sum of the two numbers is

1. 58

2. 50

3. 95

4. 85

Answer Keys

Question No.	Answer Key	Question No.	Answer Key	Question No.	Answer Key	Question No.	Answer Key
1	Option: 1	26	3241	51	Option: 1	76	Option: 3
2	Option: 3	27	Option: 1	52	Option: 3	77	3920
3	Option: 2	28	4123	53	Option: 1	78	Option: 2
4	Option: 1	29	3241	54	Option: 3	79	Option: 4
5	Option: 1	30	Option: 2	55	5	80	9
6	Option: 1	31	Option: 2	56	Option: 1	81	13
7	Option: 2	32	Option: 4	57	Option: 1	82	Option: 4
8	Option: 4	33	2	58	5	83	Option: 3
9	Option: 3	34	2	59	2	84	Option: 4
10	Option: 3	35	1	60	6	85	Option: 2
11	Option: 2	36	9	61	Option: 2	86	Option: 3
12	Option: 2	37	7	62	Option: 3	87	10
13	Option: 2	38	6	63	Option: 2	88	Option: 4
14	Option: 2	39	Option: 1	64	Option: 1	89	6144
15	Option: 3	40	Option: 1	65	Option: 3	90	3
16	Option: 3	41	Option: 3	66	Option: 3	91	Option: 2
17	Option: 1	42	Option: 1	67	Option: 2	92	Option: 4
18	Option: 2	43	Option: 1	68	Option: 1	93	Option: 2
19	Option: 3	44	Option: 4	69	20	94	Option: 3
20	Option: 4	45	Option: 1	70	Option: 1	95	Option: 3
21	Option: 2	46	Option: 3	71	Option: 4	96	9
22	Option: 1	47	Option: 3	72	2	97	Option: 1
23	Option: 1	48	Option: 4	73	Option: 3	98	880
24	Option: 2	49	Option: 2	74	Option: 2	99	5
25	2341	50	Option: 3	75	Option: 2	100	Option: 2

Solutions

Solution 1:

This passage was the simplest of all the passages. The answer to the first question can be found in the passage itself in the last sentence, where the author introduces the idea of 'topophobia'.

"And just as a beloved landscape is suddenly revealed, so too may landscapes of fear cast a dark shadow over a place that makes one feel a sense of dread or anxiety—or topophobia."

Option 1 is thus the right choice.

Solution 2:

This is a slightly difficult question. We have to read the options carefully and look for the one that is not against what the author has to say, the ones that are against what the author has to say, will contradict the author's argument. But we have to mark the choice that is not contradicting what the author has to say.'

Option 1 contradicts because the author says that olfactory response is the third most important factor, while the option says that it is the most important factor.

Option 2 also can be ruled out because the author says in the first paragraph: the emotive ties with the material environment vary greatly from person to person and in intensity, subtlety, and mode of expression. The author says 'vary greatly', while the option says 'vary little'

Option 3 can be seen in the last paragraph, and is parallel to what the author has to say. This is not contradicting the author's argument, and hence it is the right choice.

Option 4 can be ruled out because it too goes against what the author has to say.

"Most notably, new urbanism seeks to counter the perceived placelessness of modern suburbs and the decline of central cities through neo-traditional design motifs. Although motivated by good intentions, such attempts to create places rich in meaning are perhaps bound to disappoint"

The author says the New Urbanism is bound to disappoint, but the options says that it is successful as the client's demand for it.

Solution 3:

This question can be answered only by understanding the context in which the phrase has come. It reads as follows:

"Residents of upscale residential developments have disclosed how important it is to maintain their community's distinct identity, often by casting themselves in a superior social position and by reinforcing class and racial differences. "

Option 2 becomes the right answer, without any doubt. This was a very simple question.

Solution 4:

We can answer the question by reading the sentence that follows this sentence. Let's see what follows this sentence in the passage.

"Topophilia is difficult to design for and impossible to quantify, and its most articulate interpreters have been self-reflective philosophers such as Henry David Thoreau, evoking a marvelously intricate sense of place at Walden Pond, and Tuan, describing his deep affinity for the desert."

Henry David liked the pond, while Tuan liked the desert. Thus there is subjectiveness. Option 1 is the right choice.

Solution 5:

Topophilia means love for a particular place. The choice must reflect love. Option 2 goes out because in the option we have "least affinity for the place". Option 3 says that the French are not patriotic, so it too goes out because topophilia will bring patriotism. Topography has nothing to do with love, topography means understanding of the topology of a particular place. Thus only 1 fits the meaning of topophilia.

Solution 6:

This question can be answered just by reading and understanding the options carefully.

Diversity will surely come if there is long history of past influence. Both option 1 and option 2 support that. The fluidity of folk forms means adaptability of folk forms, or flexibility of folk forms. Thus even 4 justifies the idea of diversity.

Option 1 goes out because being popular or unpopular has nothing to do with diversity.

Solution 7:

The question asks us to pick a choice that cannot be inferred from the passage. Option 2 certainly cannot be inferred because this is what the passage says:

"In the late 1960s, purists were suspicious of folk songs recast in rock idioms. Electrification, however, comes in many forms."

The author says that electrification, however, comes in many forms; in other words, electrification need not always come through rock along. It might come from any other form of music as well. Thus option 2 surely cannot be inferred.

Option 4 can be inferred because Cecil Sharp talks about folk music's ability to adapt. The music of 40s and 60s demonstrates that adaptation.

The passage says that in the late 1960s, Purists were suspicious of folk songs recast in rock idioms, this suggests that it had critics. The purists were those critics. This supports choice 1 "…the lyrical freedom of Bob Dylan…

" this phrase comes in support of choice 3

Solution 8:

something that is fossilized belongs to or reminds of the past. The only correct choice that can be convincingly picked is choice 4. Rest all don't justify the word 'fossilised'

Solution 9:

Our team could not come up with the correct explanation for this question, though by elimination and by understanding the context, we can arrive at option 3 as the right choice.

Solution 10:

Right across the passage the author appreciates how folk forms have been used my modern musicians, and appreciates the fusion of folk with other forms of music.

Option 1 supports the author's opinion by asserting that folk forms have the ability to influence and be influenced by. The author will agree with this statement.

Option 2 also supports the author's contention that folk forms were relevant and are relevant even today

Option 4 also supports the author's point and therefore the author is likely to agree with this point

Option 3 is the right choice because it says that folk music exhibit unusual homogeneity. If there is homogeneity, then the idea of the adapting and infusing with other kinds of music is not valid. Thus the author will not agree with this. The author would rather say that folk music, by influencing and by getting influenced, becomes heterogeneous and not homogenous. Heterogeneous means mixed with varieties, while homogenous means comprising things of the same type.

Solution 11:

We can correctly mark the answer by reading three different parts of the paragraphs and combine them together.

"Casper (mattresses), Glossier (makeup), Away (suitcases), and many others have sprouted up to offer consumers freedom from choice"

"For start-ups that promise accessible simplicity, their very structure still might eventually push them toward overwhelming variety."

"Casper has expanded into bedroom furniture and bed linens. Glossier, after years of marketing itself as no-makeup makeup that requires little skill to apply, recently launched a full line of glittering color cosmetics."

The two companies started by offering simplicity in choices, but they might eventually push to overwhelming variety…Casper and Glossier both have done that. Thus 2 is the right choice.

Solution 12:

The author is in favour of two things: not too much variety, and mid-range pricing. Choice 2 and 3 provide less variety and out of the two only choice 2 provides mid-range pricing. Thus 2 is the right choice.

The companies have a few aesthetically pleasing and supposedly highly functional options, usually at mid-range prices". The author has praised this in the passage.

Solution 13:

Since this is an inference question, we have to derive the answer from what is given.

The passage says:

"Casper (mattresses), Glossier (makeup), Away (suitcases), and many others have sprouted up to offer consumers freedom from choice: The companies have a few aesthetically pleasing and supposedly highly functional options, usually at mid-range prices. They're selling nice things, but maybe more importantly, they're selling a confidence in those things, and an ability to opt out of the stuff rat race. . . ."

Thus we know that customers prefer fewer choices, and that in turn builds trust or confidence. Thus 1 and 3 can be inferred and will not be the right choice, as we have to pick the one that cannot be inferred.

"choice fatigue is one reason so many people gravitate toward lifestyle influencers on Instagram—the relentlessly chic young moms and perpetually vacationing 20-somethings— who present an aspirational worldview, and then recommend the products and services that help achieve it. . . ."

This extract from the passage suggests that customers are susceptible (influenced by) to marketing images on the social media (Instagram)

Choice 2 is the right answer because we have no evidence for it.

Solution 14:

Option 2 definitely supports what the author has to say; right from the start he is in favour of offering limited choices to customers. This option shows that offering fewer product can bring positive results. Thus 2 is not weakening. It becomes the right choice.

Choice 4 goes out because people go to Instagram because they are overwhelmed with choices. If that fails (as the sales are 40 percent less) it will weaken the author's argument.

Choice 1 too speaks in favour of giving greater product options to customers. Choice 3 too does the same thing.

Solution 15:

The author says towards the end that start-ups have the pressure of revenue, and they too will start offering greater number of choices to customers, as Casper and Glossier have done.

Option 1 adds depth to that prediction. So it goes out.

Option 2 says start-ups are no exception, so there is nothing unique about them. They are bound to fail or will have to change.

Option 3 adds least depth because it brings out a point that will not lead start-ups to offer more product varieties, after all they are experiencing a surge in revenue without expanding their product catalogue.

Option 4 also predicts that start-ups are likely to fail, adding weight to author's argument about their fate mentioned in the last para.

Solution 16:

We have to mark the choice that does not contribute to the passage's claim about the authorship of Aladdin.

Option 1 does contribute because it confirms that Diyab is the author of the Aladdin

Option 2 too is mentioned in the passage towards the end "…Diyab's memoir reveals a narrator adept at capturing the distinctive psychology of a young Protagonist…"

Option 4, too, supports the claim that Diyab could well be the author.

Option 3 does not support the claim because 'the French fairy tales' evidence has been disputed by the author, and he says that "The idea that Diyab might have based it on his own life — the experiences of a Middle Eastern man encountering the French, not viceversa — flips the script."

Which script is getting flipped? The story that Aladdin was inspired by French Fairy tales of the 18th century (read the passage)

Solution 17:

This is a very simple question. The main argument of the passage is that Diyab could well be the author of the passage. We have to pick a choice that goes in this direction.

Option 1 attributes the authorship to Diyab, it is the right choice

Option 2 attributes the authorship to some incomplete medieval manuscript. It goes out

Option 3 goes out for the same reason as option 2

Option 4 says that Galland derived the story, ultimately giving the credit of authorship to Galland.

Solution 18:

The first few sentences of the last paragraph have the clue to the right answer.

"To the scholars who study the tale, its narrative drama isn't the only reason storytellers keep finding reason to return to Aladdin. It reflects not only "a history of the French and the Middle East, but also [a story about] Middle Easterners coming to Paris and that speaks to our world today," as Horta puts it."

The archetype rags to riches story… has not featured in the above passage.

By reading the above paragraph, we can indisputably mark option 2 as your choice.

Solution 19:

We have to mark the choice that is not serving as evidence, as it is an except question.

Option 1 serves as evidence (Diyab was ideally placed to embody the overlapping world of East and West, blending the storytelling traditions of his homeland with his youthful observations of the wonder of 18th-century France."). The youthful observations of the wealth of Versailles refers to his cross-cultural experience. We can also eliminate choice 4 by reading above extract from the passage.

Option 2 can be ruled out because of this extract from the second paragraph: a travelogue penned in the mid-18th century. In it, he recalls telling Galland the story of Aladdin [and] describes his own hard-knocks upbringing…(the hard-knocks upbringing supports that Diyab could well be the author)

Option 3 does not serve as evidence for the character of Aladdin being based on Hanna Diyab, because Diyab could have read or heard the story from somewhere or narrated it to Galland. The fact that he is just narrating the story to Galland does not serve as evidence that Diyab is likely to be real Aladdin.

The other choices do support that.

Solution 20:

To invalidate the inversion, we have to first understand the inversion. What exactly is 'flips the script" referring to? Scholars initially thought that Aladdin must have been inspired by 18th century French Fairy tales, but "The idea that Diyab might have based it on his own life — the experiences of a Middle Eastern man encountering the French, not vice-versa — flips the script."

Here flips the script means changes the opinion that Aladdin was inspired by French Fairy tales. In other words, Aladdin was not inspired by French Fairy tales but that Diyab was the actual author. By invalidating the inversion, the question wants us to not give the credit to Diyab

Option 3 goes out because by pointing out the dissimilarity between Aladdin and French Fairy Tales, it gives the credit to Diyab.

Option 2 does not invalidate because still Diyab has seen the luxury and opulence of France, not necessarily of Versailles.

Option 1 also gives the credit to Diyab, so it is not invalidating the inversion.

Option 4 is the right choice because, if they bore no resemblance, then it disputes the evidence that Diyab ever narrated the story to Galland, as Galland claims in his diary. This would contradict, at least to some extent, the author's claim that Diyab was the author of the character of Aladdin.

Solution 21:

This question can be answered from context. It is already given that the sentence can be found in the 3rd para last part. Let's see the context:

As the cold Antarctic air cycles around their bodies, slightly warmer air comes into contact with the plumage and donates minute amounts of heat back to the penguins, then cycles away at a slightly colder temperature.

We know the cold Antarctic air's temperature is higher than that of the plumage, so the slightly warmer has that comes in contact with the plumage has to be the Antarctic air, after all the air is coming from outside (the cold Antarctic air is cycling around their bodies, so the air has to be outside). Both option 1 and 3 talk about air inside the plumage, while the sentence talks about air outside, thus options 1 and 3 go out.

We are left with 4 and 2. Option 4 goes out because the cold Antarctic air is already warmer than the penguins' plumage. The cold Antarctic air is not becoming warmer because of the heat radiated from the penguins' bodies. Thus option 4 goes out. Option 2 is the best choice and the right answer

Solution 22:

This is one of the simplest question of the paper. You just have to read the lines where the phrase has come, and it is enough to help you find the right answer.

The passage says: "…by keeping their outer surface below air temperature, the birds might paradoxically be able to draw very slight amounts of heat from the air around them…"

Isn't it a paradox that by keeping your outer surface cold, you are trying to draw slight amounts of heat from the air around your body…Option 1 precisely says that.

You should always try to find the answers from the context. If the author has used the term 'paradoxically' with respect to outer surface temperature and drawing heat from the air around them, then the right answer must also have the same context. None, except 1, have this context.

Solution 23:

We know that the plumage is responsible for maintaining body heat; it is the central idea of the passage. Food metabolism, too, helps generate heat, the passage says that clearly. We are left with two choices, thermal convection and reproduction process, but the passage says that thermal convection helps them gain heat (the passage says "the simulation showed that they might gain back a little of this heat through thermal convection"). Thus we see that thermal convection, food metabolism, and plumage all are responsible for heat gain, not heat loss. We are left with choice 1 as the right answer.

Choice 1 can be inferred from the following lines of the passage: "And given the Emperors' unusually demanding breeding cycle, every bit of warmth counts...". This suggests that the reproduction process results in heat loss.

Solution 24:

The passage says that the outer air temperature is warmer than the plumage temperature, but if the outer air temperature becomes colder than the plumage temperature, as option 1 says, the author's argument would be invalidated, because the heat transfer from the outer colder air to the relatively warmer plumage will not happen.

Since we have to mark the option that is not invalidating the author's argument, we can safely rule out choice 1 because it is weakening the author's argument.

The plumage has to be colder than the outer Antarctic air, but in choice 3 the plumage is warmer than the outer Antarctic air, so this too would weaken the author's argument in the passage.

Take choice 4; thermal convection helps the penguins get some heat, if the plumage is not allowing thermal convection to take place, there would be no gain of warmth, thus this too weakens the argument.

 Only option 2 does not weaken the argument. The passage says that the feet is warmest part of the body, if you make it a little more warmer, it will still remain the warmest part of the body. Thus 2 is not weakening the argument in any way.

 Solution 25:

1 must come at the end because it is contrasting a specific feature of print-reading and mind-reading. Before 1, we must have the ideas of print reading and mind-reading introduced to us.

 41 is definitely a pair because, and we must introduce mind-reading before statement 4. The point is should we have 2 or 3 as the opening sentence? 2 has a better introductory tone, and statement 3 goes into the detail of mind-reading. Thus we must 23 as one pair and 41 as the other, with 23 coming first. 2341 is thus the right sequence.

Solution 26:

We found this question to be slightly dubious because our team feels that there are multiple sequences possible in this question. We tracked the source of the question and discovered that the sentences have been modified and there is no clear logic behind the sentence flow. Here is the source: https://daily.jstor.org/how-carpe-diem-got-lost-in-translation/

Solution 27:

Statement 2 says that 'others believe that complex identities…'. This statement suggests that there must be a similar but slightly contrary belief immediately in the sentence preceding sentence 2. 5 says complex identities are beneficial, while 2 says that complex identities confuse. Thus 5 and 2 form a pair. 4 introduces the idea of identity and thus becomes the opening sentence of the paragraph. Since 3 introduces the idea of 'complex identities', it must come before 52 pair. Thus we have 4352 coming together to form a coherent paragraph. 1 is the odd one out.

Solution 28:

 This is the simplest parajumble that we have in this paper. Statement 4 opens the para by introducing the idea of collaborative filtering. 1 takes the idea further by giving a first-and example of collaborative filtering. 2 talks about a problem with the algorithms of collaborative filtering, and 3 gives an example of that problem. Thus 4123 form a coherent paragraph.

Solution 29:

Statement 3 opens the idea by saying that we need to learn how to deal with legitimate criticism.

By fixing the position of 1, we can arrange the sentences in the right order. 1 says 'we will all live under mob rule until then…' To what does this then refer? It must refer to some specific time or event. It refers to the time till we have new norm (read statement 4). A new norm will arise… we will have to live under a mob rule until then… Thus 4 and 1 form a pair. 2 cannot come after 1, nor does it open the para. The best place for 2 is after 3. Thus the right sequence is 3241.

Solution 30:

Everything is good with option 1 except that it says only humans have the ability to think, something that is nowhere to found in the passage. 1 can be ruled out.

Option 3 goes out because displaced reference is a distinguishing feature of language, not of humans. Option 3 can be ruled out.

Option 4 goes out because the passage says that thought precedes all meaningful communication, while option 4 says that thought precedes all speech acts, something that may not always be the case. Thus option 4 too goes out.

 Option 2 is succinct and does not have any distortions or misrepresentations.

Solution 31:

 The passage broadly talks about the difference between purse science and applied science, i.e. engineering. Further the author says that engineers might find even those theories of physics useful that from the point of view of pure physics are false. Option 2 precisely captures that. It says that engineering incorporates the constraints and conditions of physics in the real world.

Option 1 says the relationship is strictly linear, but that is not the case. Had that been the case, the false theories of pure science could not have been used by engineers for accurate predictions.

Option 3 goes out because it does not even mention the word pure science. It solely focuses on engineers, ignoring the relationship between purse science and engineering.

Option 4 gives a summary that is totally different from the what the passage discusses.

Solution 32:

There is a clear difference between the choices with respect to supraliminal and subliminal. The passage clearly tells us that Packard believed in supraliminal images, not subliminal. Thus 3 and 1 go out. We have to choose between 4 and 2.

Statement 2 says people are aware, while statement 4 says that people are not aware. The passage too says that people are not aware. Thus option 4 is the best choice.

 This was a very simple question.

Solution 33:

 To quickly answer this question, we must form pairs. 1 says 'his idea to use sign language…'. We must find the noun to which the possessive pronoun 'his' refers. Logically it refers to Pedro Ponce, as he is the one who created the sign language. Thus 4 and 1 form a pair.

 Also, only 5 can be the opening sentence, as it introduces the idea that for millennia, people with hearing impairment encountered marginalization. How they were marginalized can be seen in statement 3. Thus 5 and 3 form a pair. 5341 form a coherent para. There is no place for statement 2.

Solution 34:

Out of the five sentences, only 4 appears as an opening sentence. The others are either abrupt have pronouns that need introduction. Statement 4 opens the para by introducing the three suffix. Since the author says they were symbols, he goes further and explains what exactly these symbols meant, something that is done in statement 1. Thus 4 and 1 form a pair. Statement 5 adds on one more piece of information by mentioning that to gain the suffix (here we have three suffix) was some sort of pride in an age of technology. Statement 3 extends this idea by stating how these morphemes (symbols or suffix) were painted on to the names of scientific technologies. Thus we have 4153 forming a coherent paragraph. Statement 2 is the odd one out. The para speaks about technology, while statement 2 mentions modernism, which is not gelling with any of the other statements.

Solution for Question 35 to 38

 F + F = F.

 This implies that F has to be 0. Since all the digits are less than 10, the maximum sum of any two letters will be 17 (i.e. 9 + 8).

Therefore, a maximum of 1 can be carried over to the digits place on the left. In the ten thousands place, either the units digit of H + H = F or the units digit of H + H + 1 = F.

It cannot be H + H + 1 because 2H + 1 is an odd number and the units digit of that cannot be 0. From this, we can infer that the units digit of 2H must be 0.

This implies that H = 5. Sum of both the 6-digit numbers is a 7-digit number. This implies that the leftmost digit in the 7-digit number has to be 1. Therefore. A = 1.

Since H = 5, H + H = 10. This means that B + A + 1 = AA = 10A + A. A = 1. Therefore. B = 9.

In the hundreds place the units place of the sum A + F is C. Now A = 1 and F = 0.

But C cannot be 1. Hence, C has to be A + 1, i.e. C = 2. Therefore, G + K should be greater than 10.

The units digit of the sum of G + K is 1. This implies that G and K are either 3 and 8 or 4 and 7. not necessarily in that order.

We now have the following:

		9	5	1	1	G	0
		1	5	J	0	K	0
1	1	0	G	2	1	0

Since G is a single digit, J + 1 is less than 9.

If J = 3. G = 4 and K = 7. In that case. D and E will be 6 and 8. not necessarily in that order.

If j = 4. G = 5. which is not possible because H = 5 and each letter has a distinct number.

If J = 6. G = 7 and K = 4. In that case. D and E will be

3 and 8. not necessarily in that order.

If j = 7. G = 8 and K = 3. In that case, D and E will be

4 and 6 not necessarily in that order.

If J = 8, G = 9, which is not possible because B = 9 and each letter has a distinct number.

Solution 35:

A represents 1.

B represents 9.

Solution 36:

Solution 37:

D cannot be 7.

Solution 38:

 G cannot be 6.

Solution for Question 39 to 42

 From the information given, there are a total of 8 dance items.

 It is given that the first performance was by Princess and it was composed by Badal and the last performance was by Rani and composed by Gagan. No dancer performed her second item before the performance of the first item by all the other dancers and the dancers performed their second item in the same sequence as their first.

Therefore, the fourth and the fifth performances are by Rani and Princess respectively.

Items assigned by Ashman were consecutively numbered. Because the first four performances were by four different composers, the only possibility is that Ashman composed the fourth and the fifth performances.

If the sixth performance was composed by Badal, then the seventh would have been composed by Dyu. It is given that the number of performances between items assigned by remaining composers is the same. In that case, performances two. three and four would have been composed by Badal. Dyu and Gagan, in that order.

If the sixth performance was composed by Dyu, then the seventh would have been composed by Badal. In that case, the number of performances between items assigned by Badal is 5. Therefore, the number of items assigned by Dyu should also be 5. But that is not possible. Therefore, the second, third, sixth and seventh performances were composed by Dyu, Gagan. Badal and Dyu respectively. Since no composer who assigned music to Princess is assigned music to Queen, the sixth performance cannot be by Queen.

Therefore, the sixth and seventh performances will be by Samragni and Queen respectively. Since the sequence is the same for their first items as well, the second and third performances will be by Samragni and Queen respectively.

 Therefore, the overall sequence will be as follows:

Sequence	Dancer	Music Composer
1	Princess	Badal
2	Samragni	Dyu
3	Queen	Gagan
4	Rani	Ashman
5	Princess	Ashman
6	Samragni	Badal
7	Queen	Dyu
8	Rani	Gagan

Solution 39:

Only the statement, 'The second performance was composed by Dyu", is true.

Answer: (The second performance was composed by Dyu.)

Solution 40:

'Queen did not perform in any item composed by Gagan" is false.

Answer: (Queen did not perform in any item composed by Gagan.)

Solution 41:

Sixth performance was composed by Badal.

Answer: (Badal)

Solution 42:

The 1st and 6th performances were composed by the same composer.

Answer: (The first and the sixth)

Solution for Question 43 to 46

From the graph, we get the following values:

	Cost	Reliability	Reach	Quality	Features	Customer Service
Vendor 1	75	55	80	75	40	55
Vendor 2	80	40	55	70	45	40
Vendor 3	90	75	65	65	55	50

Vendor 4	70	25	45	40	90	70
Vendor 5	60	60	70	50	75	30

Solution 43:

Median Score in Cost is 75.

Median Score in Reliability is 55.

Median Score in Reach is 65.

Median Score in Quality is 65.

Median Score in Features is 55.

Median Score in Customer Service is 50.

The median score is least in Customer Service.

Answer: (Customer Service)

Solution 44:

Final score for Vendor 1 = 63.33 Final score for Vendor 2 = 55 Final score for Vendor 3 = 66.67 Final score for Vendor 4 = 56.67 Final score for Vendor 5 = 57.5 Vendor 3 has the highest final score.

Answer: (Vendor 3)

Solution 45:

Vendor 1 is among the top two scorers in Reach. Quality and Customer Service.

Vendor 2 is among the top two scorers in Cost and Quality.

Vendor 3 is among the top two scorers in Cost and Reliability.

Vendor 4 is among the top two scorers in Features and Customer Service.

Vendor 5 is among the top two scorers in Reliability, Reach and Features.

Vendor 1 and Vendor 5 are among the top two scorers on the maximum number of aspects.

Answer: (Vendor 1 and Vendor 5)

Solution 46:

Similarly, by observing the values from the table, Vendor 3 is among the top 3 vendors on all six aspects.

Answer: (Vendor 3)

Solution for Question 47 to 50

Since Tanzi played another round, he/she must have scored 5 in either Round 1 or Round 3. In the other round, let us say that Tanzi scored x. So Tanzi's total score would be 14 + x.

Umeza played Round 4 and Round 5. This means Umeza scored 5 in two of the first three rounds. In the remaining round, let Umezas score be y. Umeza's total score would be 13 + y.

Since the total score was not a multiple of 3 for only one person and Tanzi, Umeza and Yonita had the same total score, both 14 + x and 13 + y should be multiples of 3.

14 + x will be a multiple of 3 if x = 1 or 4. In that case the total score will be 15 or 18.

13 + y will be a multiple of 3 if y = 2 or 5. But if y = 5. then Umeza would have played Round 6 but that did not happen.

Therefore, y = 2 and x = 1. The total score of Umeza. Tanzi and Yonita is 15.

Since Wangdu did not play any round after Round 3, the maximum score that Wangdu can get is 12 when he scores 4 in both Round 1 and Round 3.

Since Xyla played all the rounds, Xyla must have scored 5 in each of the first three rounds. So Xyla's minimum total score is 22, if Xyla scored 1 in Round 6.

Zeneca played Round 4 and Round 5. So Zeneca must have scored 5 in two of the first three rounds. So Zeneca's minimum and maximum total scores are 21 and 24 respectively.

Therefore, Wangdu had the lowest score.

If Wangdu scored 12. then the highest score would be 25. Only Xyla can score 25 (5 in the first three rounds and 4 in Round 6).

If Wangdu scored 11. then the highest score would be 23. This is not possible because there will be two total scores that are not multiples of 3.

If Wangdu scored 10. then the highest score would be 21. But we know that Xyla's minimum score is 22. Therefore, this is not possible.

Any score of Wangdu less than 10 would mean the highest score is less than 20 but we know that Xyla's minimum is 22. Therefore, Wangdu scored 12 and Xyla scored 25. This implies Wangdu scored 4 in each of Round 1 and Round 3 and Xyla scored 4 in Round 6.

Xyla's total score is not a multiple of 3. Hence. Zeneca's total score must be a multiple of 3. Zeneca would have scored 21 or 24. Tanzi and Zeneca scored the same in Round 1.

Tanzi's score in Round 1 is either 1 or 5. If Tanzi scored 1 in Round 1, then Zeneca would also have scored 1 in Round 1. But in this case, both Zeneca and Tanzi would have scored 5 in Round 3. But it is given that their scores in Round 3 are different. Therefore. Tanzi scored 5 in Round 1 and 1 in Round 3.

The number of players hitting bull s eye in Round 2 is either 2 or 4. If it is 2, then the total number of 5s in Round 2 and Round 3 combined should be 3. Two of those 5s were scored by Xyla. Umeza and Zeneca would each have scored at least one 5 in Rounds 2 and 3 combined but in this case, the number of 5s in

Round 2 and 3 combined would be at least 4. which is not possible. Therefore, the number of players hitting bull's eye in Round 2 are 4. Since Tanzi and Wangdu scored 4 in Round 2, all the other players would have hit bull's eye in Round 2. This means that the number of players hitting bull's eye in Round 3 are 2. Xyla is one of them and the other one has to be either Umeza or Zeneca. But if Zeneca had scored 5 in Round 3. then Zeneca would have played Round 6, which Zeneca didn't. Therefore, Umeza is the other person who scored 5 in Round 3.

Since Umeza s total score is 15, Umeza scored 2 in Round 1.

Since Yonita's total score is 15, Yonita scored 2 in Round 1.

Zeneca s total score cannot be 21 because in that case, both Zeneca and Tanzi would have scored the same in Round 3, but they had different scores.

Therefore. Zeneca scored 4 in Round 3.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	5	4	1	5	NP	NP	15
Umeza	2	5	5	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	5	5	4	5	5	NP	24

Solution 47:

The highest total score was 25.

Solution 48:

Zeneca's total score was 24.

Solution 49:

The statement, "Xyla was the highest scorer", is true.

Solution 50:

Tanzi's score in Round 3 was 1

Solution for Question 51 to 54

It is given that X, U and Z are standing at the three corners of the triangle formed by three street segments. This means X, U and Z are standing at b, c. g or b, f, g. not necessarily in that order.

It is given that U sees V standing in the next intersection behind Z. This means U, V and Z are in a straight line with Z being in between U and V. The possibilities for this are:

(i) U, Z and V standing at b. f and j respectively. In this case, X is at g. Since X can only see U and Z, no one is standing at e. h and k. For Y to be able to see U and W, Y has to be at a and W has to be at i. But in this case, W will be able to see V, which is not valid. Hence, this case is not possible.

(ii) U, Z and V standing at b, c and d respectively. This is not possible because nobody is standing at d.

(iii) U, Z and V standing at c. b and a respectively. In this case. X is at g. Since X can only see U and Z. no one is standing at e, f. h and k. In this case. Y will not be able to see U. Hence, this is not possible.

(iv) U, Z and V standing at c. g and k respectively. In this case, X will be at b. Since X can only see U and Z, no one is standing at a. f and j. In this case. Y will not be able to see U. Hence, this is not possible.

(v) U, Z and V standing at g. f and e respectively. In this case, X will be at b. Since X can only see U and Z. no one is standing at a, c and j. W cannot see V or Z. Therefore. W cannot be at h or i. So W will be at k or I. If W is at k, Y will be at h, i or I. In none of these three places can Y see both U and W. Therefore. W is at I. For Y to be able to see only U and W, Y has to be at k.

(vi) U, Z and V standing at f, g and h respectively. In this case, X will be at b. Since X can only see U and Z, no one is standing at a, c and j. For Y to be able to see U. Y has to be at e. But in this case, Y will be able to see Z and V as well. But Y can only see U and W. Hence, this is not possible.

People are standing in the following way:
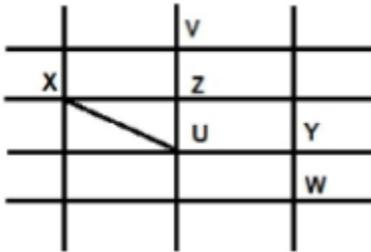
Solution 51:

No one is standing at intersection a.

Answer: (No one)

Solution 52:

V can see U and Z only.

Answer: (U and Z only)

Solution 53:

X must cross two segments (b-g-k) to reach Y.

Answer: (2)

Solution 54:

If a new person is standing at d, that person can see W and X.

Answer: (W and X only)

Solution for Question 55 to 58

First, let us rank the states for which data has been given in each of the three categories.

IPC:

From the graph, the states/UTs with the highest number of cases in descending order are:

1. Delhi

 2. Goa

3. Karnataka and Maharashtra

4. Kerala

5. Telangana

6. Haryana

7. Tamil Nadu

8. Puducherry

9. West Bengal

SLL:

It is mentioned that in West Bengal, there are 520 cases registered as SLL crimes. No other state or union territory in the graph has more than West Bengal. The states/UTs with the highest number of cases in descending order are:

1. West Bengal

 2. Karnataka

3. Delhi

4. Maharashtra and Goa

5. Haryana

6. Tamil Nadu

7. Telangana and Kerala

8. Puducherry

Other Crimes:

From the graph, the states/UTs with the highest number of cases in descending order are:

1. Delhi

2. Tamil Nadu

3. Puducherry

4. Karnataka

5. Goa

6. Kerala

7. Haryana

8. Telangana and Maharashtra

9. West Bengal

Solution 55:

From the table, Karnataka and Maharashtra are ranked 3. Therefore, from the above, we can say that Delhi and Goa are ranked 1 and 2 respectively. Telangana is ranked 6. From this, it can be inferred that Kerala is ranked 5 in IPC crimes.

Ans: (5)

Solution 56:

The two states with the highest total number of cases are Delhi and West Bengal.

The total number of cases under IPC crimes = 65 in Delhi + 0 in West Bengal = 65 The total number of cases under SLL crimes = (95 - 65) in Delhi + 520 in West Bengal = 550.

Therefore, the ratio = 65/550 which is approximately 1 : 9.

Ans: (1 : 9)

Solution 57:

In the Other Crimes category, Maharashtra and Telangana have a rank of 8, which means there are 7 states that have a higher number of cases than Maharashtra and Telangana.

These states are the seven states are the states mentioned in the graph. Therefore, the rankings of the states in the Other Crimes category will be as follows:

1	2	3	4	5	6	7	8
Delhi	Tamil Nadu	Puducherry	Karnataka	Goa	Kerala	Haryana	Telangana and Maharashtra

Ans: (Both i) and ii))

Solution 58:

In SLL category, since Goa's rank is 4, Delhi's rank must be 3. Hence. Delhi has a rank of 1, 3 and 1 in IPC, SLL and Other Crimes categories respectively. Therefore, sum of ranks of Delhi in the three categories = 5.

Ans: (5)

Solution 59:

The minimum possible number of different types of prizes is 2 when the number of items of type a and b are 1 and 99 respectively.

Answer: (2)

Solution 60:

The minimum number of boxes for each type will be a = 1, b = 2. c = 4. d = 8, e = 16. f = 32, g = 64 and so on. But the number of items of type g = 64 is not possible because the total number of boxes will be 127 in that case. Therefore, there cannot be 7 types of prizes. But 6 types of prizes is possible. For example, the number of items of type a, b, c, d. e and f can be 1. 2, 4. 8, 16 and 69 respectively. Therefore, the maximum possible number of different types of prizes is 6.

Answer: (6)

Solution 61:

There can be 30 items of type b, when there are 69 items of type c.

There can be 75 items of type e, when the number of items of type b. c and d are 2, 4 and 18 respectively. There can be 60 items of type d, when the number of items of type b and c are 9 and 30 respectively.

There cannot be 45 items of type c. Because in that case, the number of items of type b can be a maximum of 22. Since the total number of items is not 100, we have to go to the next type. i.e. d. The number of items of d would have to be at least 90. This is not possible because the total number of items will be at least 138, but we only have 100. Hence, there cannot be 45 items of type c.

Answer: (There are exactly 45 items of type c.)

Solution 62:

It can be inferred that there are 75 items of the same type. We know that the maximum possible number of types of prizes is 6. But in that case, the maximum possible number of items should belong to type f but the maximum number of items of type f is 69. Hence, it cannot be 6.

The maximum possible number of types of prizes can be 5. In that case, the maximum possible number of items should belong to type e. There can 75 items of type e, when the number of items of type b. c and d are 2. 4 and 18 respectively.

Therefore, the maximum possible number of different types of items is 5.

Answer: (5)

Solution for Question 63 to 66

There are 12 items such that, 5 of them are biscuits, 3 of them are candies and 4 of them are savories.

It is given that K is in the shelf numbered 16.

D, E and F are placed in consecutively numbered shelves in the ascending order. They are placed after biscuits and candies. From this, it can be inferred that D, E and F are savories and they are placed at the end. Since K is in the last shelf, K is also a savory and all items of the same type are placed in consecutively numbered shelves, D, E, F and K will be in shelves numbered 13, 14, 15 and 16 respectively.

Now L and J are same type of items and since I and J are in consecutively numbered shelves, L, I and J are either biscuits or candies. It is given that C is a candy. If L, I and J are candies, then there would be a total of four candies. But it is not possible because there are only three candies. Therefore, L, I and J are biscuits. H is different from L. Therefore, H has to be a candy. Both A and B are in consecutively numbered shelves. This implies that they are of the same type. If A and B are candies, then the total number of candies will be 4. But this is not possible because there are only three candies. Therefore, A and B are biscuits.

We have two cases here.

Case 1: Candies are placed after biscuits

It is given that L is placed after exactly one empty shelf. Since biscuits are placed before candies, L is to be placed in shelf 2. Hence, the shelves numbered 2, 3, 4, 5 and 6 will have biscuits in them. I and J are in shelves numbered higher than those of A and B. Therefore. A and B will be in shelves 3 and 4 respectively. I and J will be in shelves 5 and 6. not necessarily in that order.

C is placed in a shelf preceded by two empty shelves. Therefore. C will be in shelf 9. Both H and G will be in shelves 10 and 11 in no particular order. Shelf numbered 12 will be empty.

Biscuits	2. L
	3.A
	4. B
	5.1/J
	6. J/I
Candies	9. C
	10.H/G
	11.G/H
Savories	13.D
	14.E
	15.F
	16.K

The shelves numbered 1, 7,8 and 12 are empty.

Case 2: Biscuits are placed after candies

C is placed in a shelf preceded by two empty shelves. Since candies are placed before biscuits, C will be in shelf 3. Both H and G will be in shelves 4 and 5, not necessarily in that order. Shelf 6 will be empty.

It is given that L is placed after exactly one empty shelf. Therefore. L will be in shelf 7. Hence, the shelves numbered 7, 8, 9,10 and 11 will have biscuits in them.

I and J are in shelves numbered higher than those of A and B. Therefore. A and B will be in shelves 8 and 9 respectively. I and J will be in shelves 10 and 11. not necessarily in that order. Shelf numbered 12 will be empty.

The arrangement will be as follows:

Candies	3. C
	4. H/G
	5. G/H
Biscuits	7. L
	8. A
	9. B
	10. I/J

	11. J/I
Savories	13. D
	14. E
	15. F
	16. K

The shelves numbered 1. 2, 6 and 12 are empty.

Solution 63:

The items can be arranged in 4 ways in the first case and 4 ways in the second case. Therefore, they can be arranged in a total of 8 ways. Answer: (8)

Solution 64:

G is not a biscuit.

Answer: (G)

Solution 65:

Shelves numbered 1, 2, 6 and 12 can be empty.

Answer: (1,2, 6. 12)

Solution 66:

There are at least four shelves in between B and C in both the cases. This is true.

Answer: (There are at least four shelves between items B and C.)

Solution 67:

$$(\sqrt{2})^{19} 3^4 4^2 9^m 8^n = 3^n 16^m (\sqrt[4]{64})$$

$$\Rightarrow 2^{19/2} \times 3^4 \times 2^4 \times 3^{2m} \times 2^{3n} = 3^n \times 2^{4m} \times 2^{3/2}$$

$$\Rightarrow 2^{(19/2+4+3n)} \times 3^{(4+2m)} = 2^{(4m+3)} \times 3^n$$

Comparing the powers of same bases we get

$$\frac{19}{2} + 4 + 3n = 4m + \frac{3}{2} \cdots (1)$$

$$4 + 2m = n \cdots (2)$$

Substitute the value of n from (2) in (1) and solving for m, we get m = -12

Solution 68:

Let the income of Bimla be Rs. 100

Amla's income = 1.2*100 = Rs. 120

Also, Amla's income = $\frac{4}{5}$ x Kamla's income

Therefore, Kamla's income = $\frac{5}{4}$×120 =Rs. 150

Kamala's new income with 4% decrease = 0.96×150 =Rs. 144

Bimla's new income with 10% increase = 1.1×100= Rs. 110

Required percentage increase = $\left(\frac{144-110}{110}\right)\times100 \approx 31\%$

Solution 69:

Let number of girls and boys be 3x and 2x respectively.

Given,

3x-2x=30

Or x = 30. So the number of students = 3x+2x=5x =150.

Also, number of girls (3x) and boys (2x) = 90 and 60 respectively.

Number of students pass the exam = 68% of 150=102.

Number of girls pass the exam = 102-30 = 72 .

Therefore, number of girls who fail in the exam = 90-72=18

Hence, percentage of girls fail the exam = $\frac{18}{90}\times100 = 20\%$

Solution 70:

Let the cost prices of a pen and a books be x and y respectively.

From 1st condition,

0.95x + 1.15y = x+y+7 ... (1)

From 2nd condition,

1.05x + 1.1y = x + y +13 ... (2)

Solving both (1) and (2) for y, we get y=80.

Solution 71:

Refer to the below figure:
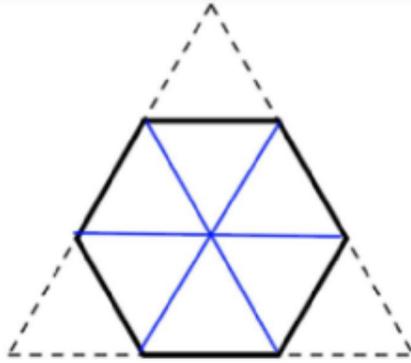
As we can see, the triangle can be divided into 9 concurrent smaller equilateral triangles.

Also, hexagon contains 6 of them.

Hence the required ration = 6/9 =2/3

Solution 72:

The below figure shows the graph of both the expressions.
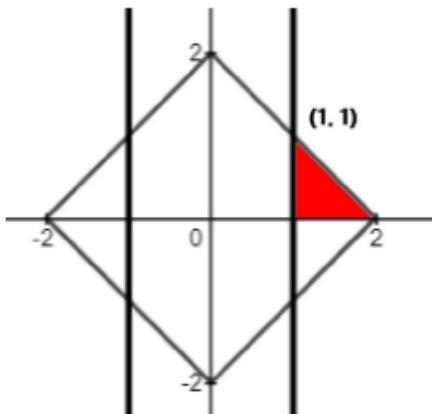
The required area = 4× the area of red triangle.

Area of red triangle $=\dfrac{1}{2}\times1\times1=\dfrac{1}{2}$ sq. units

Therefore, the required area = $4\times\dfrac{1}{2}=2$

Solution 73:

Let Gautam's score be g. Also, let x be the average of all 22 students so that the total scores of all 22 students =22x.

From the first condition:

22x-g = 21×62 … (1)

From the second condition:

$$22x - 82.5 = 21(x-1)$$
$$\Rightarrow 22x - 21x = 82.5 - 21$$
$$\Rightarrow x = 61.5$$

Putting x=61.5 in (1), we get g = 51.

Solution 74:

Let the work be LCM of (9 and 12) = 36 units.

Let the amount of work done in one day with their normal efficiencies by A and B be x and y units respectively.

Therefore, (x+y)×12=36

Or x+y =3 ... (1)

Similarly,

(x/2+3y)×9=36

Or x/2 +3y = 4 ... (2)

Solving (1) and (2) for x, we get x =2 units

Hence, A alone would take 36/x = 36/2 = 18 days to complete the work with her normal efficiency.

Solution 75:

Shortcut:

For such questions, we can take value of n =1. The right option must give the first term i.e.

$$\frac{1}{\sqrt{a_1} + \sqrt{a_2}}$$

Only option (2) satisfies.

Solution 76:

Refer to the diagram below:
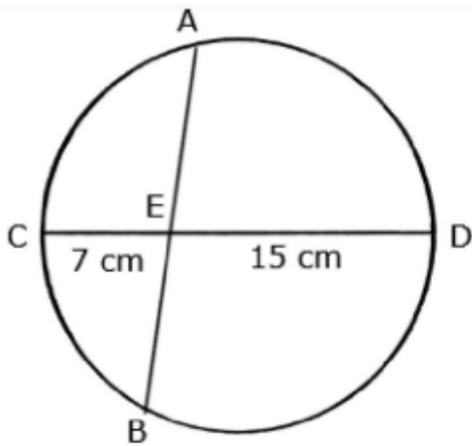
Applying chord chord power theorem

$$AE \times BE = CE \times DE$$

$$\Rightarrow AE \times BE = 7 \times 15 = 105 \ ...(1)$$

Also, it is given that AE+BE=20.5 ...(2)

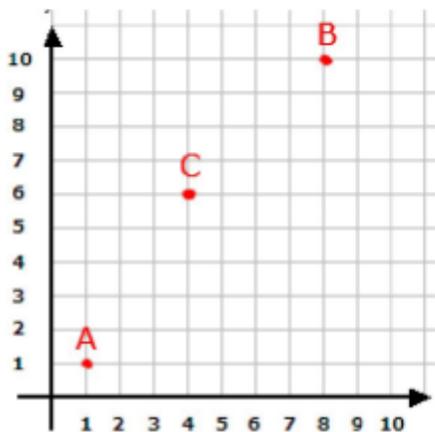$$(AE - BE)^2 = (AE + BE)^2 - 4 \times AE \times BE$$

$$\Rightarrow (AE - BE)^2 = (20.5)^2 - 4 \times 105$$

$$\Rightarrow (AE - BE)^2 = 420.25 - 420 = 0.25$$

$$\Rightarrow (AE - BE) = 0.5$$

Solution 77:

Let A, B and C represent the coordinates (1, 1), (8,10) and (4,6) respectively.

The number of ways to go from A to B via C = (The number of ways to go from A to C)×(The number of ways to go from C to B)

$$= {}^8C_5 \times {}^8C_4 = 3920$$

Solution 78:

Ratio of their incomes = 3:4:5

Ratio of their interests = 6:5:4

Therefore, the ratio of their interest income = $(3 \times 6):(4 \times 5):(5 \times 4) = 18:20:20$

Let the interest incomes of Amala, Bina, and Gouri be 18x, 20x, and 20x respectively.

Given,

Bina's interest income exceeds Amala's by Rs 250

Therefore, 20x-18x=2x=250

Or x = 125.

Total interest incomes = 18x+20x+20x=58x = 58×125 =7250

Solution 79:

Let the number of members playing all three games be x.

Given, that all the members play at least one of these three games, hence the union of these three sets = 256.

Therefore,

256 =144+123+132)-(58+25+63)+x

Or x = 3.

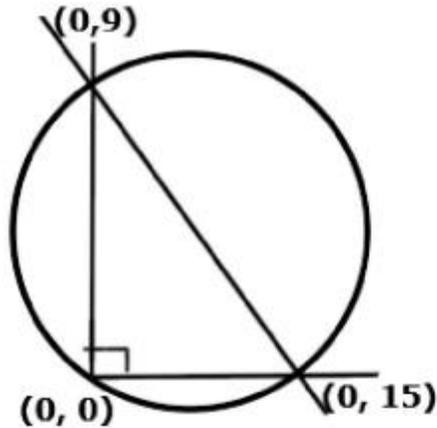Fitting the numbers in the venn diagram, we get
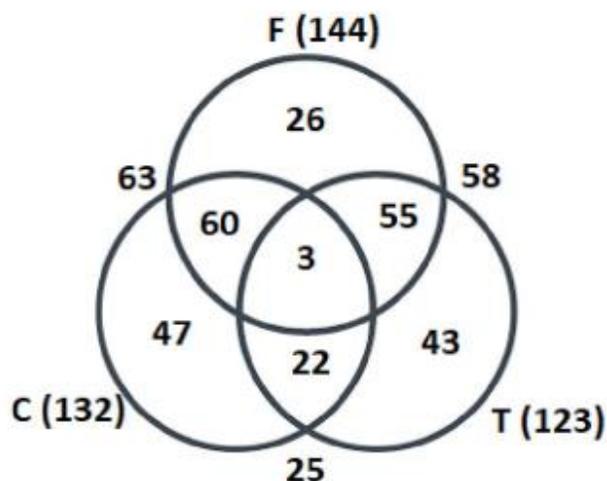
Clearly, the number of members playing only tennis = 43.

Solution 80:

Clearly, the triangle will be right angled triangle and the hypotenuse would be the diameter of the circumcircle.

Getting the coordinates by substituting x and y with 0 alternatively in the equation 3x+5y45=0, we have

Hypotenuse = $\sqrt{9^2 + 15^2} = \sqrt{306} \approx 17.5$

Therefore, the radius $= \dfrac{17.5}{2} \approx 8.7$

Hence, the closest integer = 9.

Solution 81:

Let one machine completes 1 unit of work per day.

Given, two machines can finish the job in 13 days

Therefore, the work of 2×1×13 = 26 units.

Also, let on man completes m units of work per day.

From the given condition:

3m+8×1 = 2(8m+3×1)

Or m = $\dfrac{2}{13}$ *units*

Let it require 'x' number of men to complete the work in 13 days.

Therefore, xm×13 =26 units

Or x = 13 men

Solution 82:

Solution 83:

We have ,

$$(5.55)^x = 1000$$
$$\Rightarrow (5.55)^x = 10^3$$

Taking log both the side we get

$$x\log_{10}(5.55) = 3$$
$$\Rightarrow \log_{10}(5.55) = \frac{3}{x}$$
$$\Rightarrow \log_{10}(10 \times 0.555) = \frac{3}{x}$$
$$\Rightarrow \log_{10}(0.555) + 1 = \frac{3}{x} \quad \ldots(1)$$

Also, we have been given

$$(0.555)^y = 1000$$

Taking log both the side

$$y\log_{10}(0.555) = 3$$
$$\Rightarrow \log_{10}(5.55) = \frac{3}{y} \quad \ldots(2)$$

From (1) and (2)

$$\frac{3}{y} + 1 = \frac{3}{x}$$
$$\Rightarrow \frac{1}{x} - \frac{1}{y} = \frac{1}{3}$$

Solution 84:

$$x^2 - x - 6 = (x+2)(x-3)$$

Case 1: $x^2 - x - 6 < 0$

i.e. (x+2)(x-3)<0

$$\Rightarrow -2 < x < 3 \text{ and } \left|x^2 - x - 6\right| = -\left(x^2 - x - 6\right)$$

Therefore, $\left|x^2 - x - 6\right| = x + 2$

$$= -(x+2)(x-3) = x+2$$
$$\Rightarrow (x-3) = -1 \Rightarrow x = 2$$

Case 2: $x^2 - x - 6 \geq 0$

i.e. $(x+2)(x-3) \geq 0$

$$\Rightarrow x \le -2 \ or \ x \ge 3$$

Checking for boundary conditions:

For x=-2, $\left|x^2 - x - 6\right| = x + 2$, therefore, x=-2 is also the root. But for x=3, $\left|x^2 - x - 6\right| \ne x + 2$.

Hence x=3 is NOT the root.

And for the interval $x < -2 \ or \ x > 3$ the expression $\left|x^2 - x - 6\right| = x^2 - x - 6$

Therefore, $\left|x^2 - x - 6\right| = x + 2$

$$= (x + 2)(x - 3) = x + 2$$
$$\Rightarrow (x - 3) = 1 \Rightarrow x = 4$$

Therefore, the root are -2, 2, and 4. So the required product = (2)(-2)(4)=-16

Solution 85:

The distance travelled by bicycle A in one revolution = $2\pi r_a = 2\pi \times 30 = 60\pi \ cm$

The distance travelled by bicycle B in one revolution = $2\pi r_b = 2\pi \times 40 = 80\pi \ cm$

Let B makes 'n' revolutions to cover the distance. Then, A would make (n+5000) to cover the same distance.

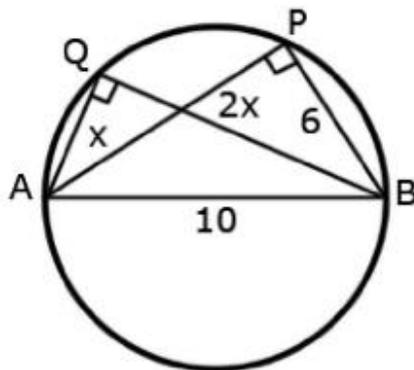$$\therefore n \times 80\pi = (n + 5000) \times 60\pi \Rightarrow n = 15000$$

Distance travelled by B = $n \times 80\pi \ cm = \dfrac{15000 \times 80\pi}{10^5} \ km = 12 \ km$

Time taken by B= 45 min = $\dfrac{45}{60} = \dfrac{3}{4} hrs$

Hence the speed of B = $\dfrac{12\pi}{3/4} = 16\pi \ km \ / \ h$

Solution 86:

Refer to the figure below:

$\angle APB = \angle AQB = 90^0$ {angle in a semicircle is a right angle}

Also, let AQ=x, so AP=2x

In Right $\triangle APB$

$AP^2 = AB^2 - BP^2$

$$\Rightarrow AP^2 = 10^2 - 6^2 = 8^2$$

$AP^2 = AB^2 - BP^2 \Rightarrow AP = 8 \Rightarrow 2x = 8$

$$\Rightarrow x = 4$$

Similarly, in Right $\triangle AQB$

$BQ^2 = AB^2 - AQ^2$

$\Rightarrow BQ^2 = 10^2 - 4^2 = 84$

$\Rightarrow BQ = \sqrt{84} \approx 9.1$

Solution 87:

Case 1: m is even.

Given, 8f(m + 1) - f(m) = 2

$\Rightarrow 8(m+1+3) - m(m+1) = 2$

$\Rightarrow 8m + 32 - m^2 - m = 2$

$\Rightarrow m^2 - 7m + 30 = 0$

$\Rightarrow (m-10)(m+3) = 0$

$\Rightarrow m = 10 \ or \ -3$

As m is positive integer, the only possible value of m =10.

Case 2:

If m is odd, then we would not be getting positive solution.

Solution 88:

Weight of liquid 1 per litre = 1000 gm

Weight of liquid 2 per litre = 800 gm

Weight of mixture per litre = 2×480=960 gm

Applying alligation rule

$$\frac{Quantity \ of \ liquid \ 1}{Quantity \ of \ liquid \ 2} = \frac{960-800}{1000-960} = \frac{4}{1}$$

Therefore, the liquids are mixed in 4:1.

Hence, the percentage of liquid $1 = \left(\dfrac{4}{4+1}\right) \times 100 = 80\%$

Solution 89:

If n =1, $a_1 = 3\left(2^{1+1} - 2\right) = 6 = 3 \times 2^1$

If n=2, $a_1 + a_2 = 3\left(2^{2+1} - 2\right) = 18 \Rightarrow a_2 = 18 - a_1 = 12 = 3 \times 2^2$

If n=3, $a_1 + a_2 + + a_3 = 3\left(2^{3+1} - 2\right) = 42 \Rightarrow a_3 = 42 - \left(a_1 + a_2\right) = 24 = 3 \times 2^3$

Following the pattern, $a_n = 3 \times 2^n$

Therefore, $a_{11} = 3 \times 2^{11} = 6144$

Solution 90:

$$f(a+1) + f(a+2) + \ldots + f(a+n) = 16\left(2^n - 1\right)$$

$$\Rightarrow f(a)f(1) + f(a)f(2) + \ldots + f(a)f(n) = 16\left(2^n - 1\right)$$

$$\Rightarrow f(a)\left(f(1) + f(2) + \ldots + f(n)\right) = 16\left(2^n - 1\right)$$

Take n=1,

$$\Rightarrow f(a)f(1) = 16\left(2^1 - 1\right) = 16$$

$$\Rightarrow f(a) \times 2 = 16 \Rightarrow f(a) = 8$$

Therefore,

$$f(a)\left(f(1) + f(2) + \ldots + f(n)\right) = 16\left(2^n - 1\right)$$
$$\Rightarrow f(1) + f(2) + \ldots + f(n) = 2\left(2^n - 1\right)$$

If n=2, then $f(1) + f(2) = 2\left(2^2 - 1\right) = 6$

$$\Rightarrow f(2) = 6 - f(1) = 6 - 2 = 4$$

If n=3, then $f(1) + f(2) + f(3) = 2\left(2^3 - 1\right) = 14$

$$\Rightarrow f(3) = 6 - f(1) - f(2) = 14 - 2 - 4 = 8 = f(a)$$

Hence a =3.

Solution 91:

For any real value of x, the expression $2\cos(x(x+1)) = 2^x + 2^{-x}$ would always be positive.

Lets find the maximum value of $2\cos(x(x+1)) = 2^x + 2^{-x}$.

Applying AM-GM inequality we have

$$\frac{2^x + 2^{-x}}{2} \ge \sqrt{2^x \times 2^{-x}}$$

$$\Rightarrow 2^x + 2^{-x} \ge 2\sqrt{2^0}$$

$$\Rightarrow 2^x + 2^{-x} \ge 2$$

Therefore, $2\cos\left(x(x+1)\right) \ge 2$

It is known that $-1 \le \cos\theta \le 1$

$$\Rightarrow 2\cos\left(x(x+1)\right) = 2$$

Hence, the expression is valid only if $2^x + 2^{-x} = 2$, which is true for only one value of x i.e. 0.

Therefore, the expression has only one real solution.

Solution 92:

$$\log_5(x+y) + \log_5(x-y) = 3$$

$$\Rightarrow \log_5\left[(x+y)(x-y)\right] = 3$$

$$\Rightarrow (x+y)(x-y) = 5^3 = 125$$

$$\Rightarrow x^2 - y^2 = 125...(1)$$

And $\log_2 y - \log_2 x = 1 - \log_2 3$.

$$\Rightarrow \log_2\left(\frac{y}{x}\right) = \log_2 2 - \log_2 3$$

$$\Rightarrow \log_2\left(\frac{y}{x}\right) = \log_2\left(\frac{2}{3}\right)$$

$$\Rightarrow \frac{y}{x} = \frac{2}{3}$$

Let $x = 3k$ and $y = 2k$. Putting the values in (1)

$$(3k)^2 - (2k)^2 = 125$$

$$\Rightarrow 5k^2 = 125$$

$$\Rightarrow k = 5$$

Hence $x \times y = 3k \times 2k = 6 \times 25 = 150$

Solution 93:

Let the total journey time taken by Amal be 3t hours.

Therefore, the total distance = 10t + 20t + 30t = 60t kms

Bimal took each mode of transport 1/3 of the total distance.

Therefore, total time taken by him = $\dfrac{20t}{10} + \dfrac{20t}{20} + \dfrac{20t}{30} = \dfrac{11t}{3}$ hours

The percentage by which Bimal's travel time exceeds Amal's travel time

$\left(\dfrac{(11/3)t - 3t}{3t}\right) \times 100 = 22.22\%$

Solution 94:

Let the edges of the brick be a, b, and c such that $a < b < c$

$a^2 + b^2 = 3^2 = 9....(1)$

$a^2 + c^2 = \left(2\sqrt{3}\right)^2 = 12...(2)$

$b^2 + c^2 = \left(\sqrt{15}\right)^2 = 15...(3)$

Adding all three equations. We get

$2\left(a^2 + b^2 + c^2\right) = 9 + 12 + 15 = 36$

$a^2 + b^2 + c^2 = 18...(4)$

From (1) and (4), $c = 3$

From (3) and (4), $a = \sqrt{3}$

Therefore, required ratio = $\dfrac{a}{c} = \dfrac{\sqrt{3}}{3} = \dfrac{1}{\sqrt{3}}$

Solution 95:

We can transform each of the options for 'n' years.

$(997)2^{14} + 3 \equiv (p-3)2^{n-1} + 3$

$(1003)2^{15} + 6 \equiv (p+3)2^n + 6$

$(1003)2^{15} - 3 \equiv (p+3)2^n - 3$

$(997)^{15} - 3 \equiv (p-3)^n - 3$

As per the condition, in one year, the population 'p' becomes '3+2p'

Putting the value of n =1 in each option, and checking to get 3+2p, we have

$(p-3)2^{n-1} + 3 \equiv 3 \neq 3 + 2p$

$(p+3)2^n + 6 \equiv (p+3)2 + 6 \neq 3 + 2p$

$(1003)2^{15} - 3 \equiv (p+3)2 - 3 = 3 + 2p$

$(p-3)^n - 3 \equiv (p-3) - 3 \neq p - 6$

Hence, the right answer is option 3.

Solution 96:

Let the amount invested in fixed deposit be x lakhs.

As per the condition:

$$x \times \frac{6}{100} + \frac{2}{3} \times (15-x) \times \frac{4}{100} + \frac{1}{3} \times (15-x) \times \frac{3}{100} = \frac{76000}{10^5}$$

$$\Rightarrow 6x - \frac{8}{3}x - x = 76 - \frac{8}{3} \times 15 - 15$$

$$\Rightarrow \frac{7}{3}x = \frac{76 \times 3 - 11 \times 15}{3}$$

$$\Rightarrow \frac{7}{3}x = \frac{63}{3}$$

$$\Rightarrow x = 9$$

Solution 97:

Let the total score of the exam be 100x.

Meena's before review = 40% of 100x = 40x.

Her score after review = 40x + 50%of 40x = 60x.

Passing marks = 60x+35. .. (1)

Her score after increasing it by 20% of post revie score = 60x+20% of 60x = 72x

Passing marks = 72x-7. ... (2)

Equating (1) and (2)

72x-7 = 60x + 35

$$\Rightarrow x = 3.5$$

Hence, Total Marks = 100x= 350 and passing marks = 60x+35 = 245

Therefore, passing percentage = $\frac{245}{350} \times 100 = 70\%$

Solution 98:

Let the first, second, and third horses be A, B and C respectively. Also, let the length of the racecourse be x.

A	B	C	
x	(x-11)	(x-90)	{from 1ˢᵗ condition}
	x	(x-80)	{from 2ⁿᵈ condition}

Therefore,

$$\frac{(x-11)}{(x)} = \frac{(x-90)}{(x-80)}$$

$$\Rightarrow x^2 - 91x + 880 = x^2 + 90x$$

$$\Rightarrow x = 880$$

Solution 99:

case I: x=0.

Clearly, $x = 0$ satisfy the equation.

case II: x>0

$$|x|(6x^2 + 1) = 5x^2$$

$$\Rightarrow x(6x^2 + 1) = 5x^2$$

$$\Rightarrow 6x^2 + 1 - 5x = 0$$

On solving the quadratic equation, we get $x = \frac{1}{2}, \frac{1}{3}$ (both valid)

Case III: x<0

$$|x|(6x^2 + 1) = 5x^2$$

$$\Rightarrow -x(6x^2 + 1) = 5x^2$$

$$\Rightarrow 6x^2 + 5x + 1 = 0$$

On solving the quadratic equation, we get $x = \frac{-1}{2}, \frac{-1}{3}$ (both valid)

Hence there are 5 solutions.

Solution 100:

Let the two numbers be x and y

Given,

$$x \times y = 616$$

Also, $\dfrac{x^3-y^3}{(x-y)^3}=\dfrac{157}{3}$

Let $x^3-y^3=157k$ and $(x-y)^3=3k$

we know that

$(x-y)^3=x^3-y^3-3xy(x-y)$

$\Rightarrow(3k)^3=157k-3\times616(3k)^{1/3}$

$\Rightarrow154k=3\times616\times(3k)^{1/3}$

$\Rightarrow k=\dfrac{3\times616}{154}\times(3k)^{1/3}$

$\Rightarrow k=12\times(3k)^{1/3}$

$\Rightarrow k^3=12^3\times3\times k$

$\Rightarrow k^2=3\times12^3$

$\Rightarrow k=72$

Therefore, $x-y=(3k)^{1/3}=(3\times72)^{1/3}=6$

Also, $(x+y)^2=(x-y)^2+4xy$

$\Rightarrow(x+y)^2=6^2+3\times616=2500$

$\Rightarrow(x+y)=50$