CAT 2019
Slot 1
Question paper &
Solution

Slot-1 VARC

Direction (Q1-5): Read the following discussion/passage and provide an appropriate answer for the questions that follow.

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."

1. All of the following serve as evidence for the character of Aladdin being based on Hanna Diyab EXCEPT:
A. Diyab's cosmopolitanism and cross-cultural experience.
B. Diyab's humble origins and class struggles, as recounted in his travelogue.
C. Diyab's description of the wealth of Versailles in his travelogue.
D. Diyab's narration of the original story to Galland.
Answer: D
Solution:
Option A can be inferred from the fact mentioned in para 3 of the passage—'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.' So, his cosmopolitan life and cross-cultural experience shows that Diyab was the model for Aladdin's story.
Option B: Diyab's humble origins and class struggles are similar to Aladdin's rags to riches story; so, this also serves as evidence.
Option C: The descriptions Diyab uses were very similar to the descriptions of the lavish palace that ended up in Galland's version of the Aladdin story. So, Diyab described a palace he actually saw; this shows that the story was based on his own life.
Option D is the right answer. The fact that Diyab told the story to Galland does not in any way prove that the character of Aladin was based on his life. It could be a fictional tale he told Galland.

2. The author of the passage is most likely to agree with which of the following explanations for the origins of the story of Aladdin?
A. Galland derived the story of Aladdin from Diyab's travelogue in which he recounts his fascination with the wealth of Versailles.
B. The story of Aladdin has its origins in an undiscovered, incomplete manuscript of a medieval Arabic collection of stories.
C. Basing it on his own life experiences, Diyab transmitted the story of Aladdin to Galland who included it in Arabian Nights.
D. Galland received the story of Aladdin from Diyab who, in turn, found it in an incomplete medieval manuscript.
Answer: C
Solution:
According to the passage, Galland wrote in his diary that he first heard the tale from a Syrian storyteller from Aleppo named Hanna Diyab.
Diyab wrote a travelogue in which he recalls telling Galland the story of Aladdin. He describes his difficult upbringing and the extravagance of Versailles.
The descriptions Diyab uses in his travelogue were very similar to the descriptions of the lavish palace that ended up in Galland's version of the Aladdin story.
From this author, Paulo Lemos Horta claims that Aladdin might be the young Arab Maronite from Aleppo.
The author of the passage gives further evidence about Diyab's sensitivity towards the rioting Arabs in Paris.
From all this, we can infer that the author of the passage believes Aladdin to be Diyab. Hence, option (C) is the correct answer.

Option (A) is incorrect as Galland did not derive the story from Diyab's travelogue; Diyab narrated his story to Galland.

Option (B) is incorrect as the medieval manuscript in the passage refers to the Arabian nights, which started as a series of translations of an incomplete manuscript of a medieval Arabic story collection.

Option (D) is contradictory to what is stated in the passage.

Hence, option (C) is correct.

3. Which of the following, if true, would invalidate the inversion that the phrase 'flips the script' refers to?

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

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

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

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

Answer: C

Solution:

To answer this question, we have to understand the meaning of the phrase 'flip the script' in the context of the passage and then look for an option which proves that the script has not been flipped—or that the author's claim about the script being flipped or reversed is incorrect.

The author says that scholars thought that the rags-to-riches story of Aladdin might have been inspired by the plots of French fairy tales ..., or that the story was invented ... as a byproduct of French Orientalism. 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.

To invalidate this idea we have to choose an option which states that Aladdin was not based on Diyab's story—the story of a middle eastern man in France.

Examining the options, we can see the following:

Option A will not invalidate the idea of Aladdin's story being based on a middle eastern boy in Paris—the opulence of Bordeaux or any other French province does not weaken the idea that Diyab marvelled at the opulence of France.

Option B will not invalidate it as it shows that it was not taken from French fairy tales. It might even strengthen the author's claim.

Option D will not invalidate it as the script is not about the origins of the story; it is about the inspiration behind the story.

Option C is correct. The main reason why scholars such as Horta believe that Aladdin's character is based on Diyab is the descriptions of the palace in Galland's story and Diyab's travelogue being identical. If they were not, then the whole basis of it being an autobiographical narrative of Diyab will not hold. Hence, it invalidates the 'flips the script' claim of the author.

4. Which of the following is the primary reason for storytellers still being fascinated by the story of Aladdin?
A. The traveler's experience that inspired the tale of Aladdin resonates even today.
B. The tale of Aladdin documents the history of Europe and the Middle East.
C. The archetype of the rags-to-riches story of Aladdin makes it popular even today.
D. The story of Aladdin is evidence of the eighteenth-century French Orientalist.
Answer: A
Solution:
Refer to the concluding paragraph in the passage—'To the scholars who study the tale, its narrative drama isn't the only reason storytellers keep finding reasons 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.'
So, it's not just a reflection of the history of France but more importantly (what follows the but also is important), a story of middle easterners coming to Paris (in other words, travelers) that speaks to our world today (in other words, resonates with us).
This is expressed exactly in option (A). Hence, it is the correct answer.

5. Which of the following does not contribute to the passage's claim about the authorship of Aladdin?
A. The narrative sensibility of Diyab's travelogue
B. The depiction of the affluence of Versailles in Diyab's travelogue
C. Galland's acknowledgment of Diyab in his diary
D. The storyline of many French fairy tales of the 18th-century
Answer: D
Solution:
The author of the passage mentions various points about the authorship of Aladdin.
Option (A) has been mentioned in the concluding paragraph. Refer to the lines '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.'
So, Diyab's narrative sensibilities support his authorship of Aladdin.
Option (B) has been mentioned in the second paragraph where the author states that in his travelogues, Diyab mentions the opulence 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 leading to the belief that Diyab and Aladdin were the same person.'
Option (C) shows that Diyab and not Galland was the author of the story.
Option (D) is the answer—the storyline of French fairy tales of the 18th century cannot prove the authorship of Aladdin's tale.
Hence, option (D) is the correct answer.

Direction (Q6-10): Read the following discussion/passage and provide an appropriate answer for the questions that follow.
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.

6. 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?
A. An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their product catalogue.
B. With the motive of promoting certain rival companies, the government decides to double the tax-rates for these start-ups.
C. With Casper and Glossier venturing into new product ranges, their regular customers start losing trust in the companies and their products.

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

Answer: A

Solution:

The question asks us to choose an option which adds least depth, in other words, does not support the author's prediction. Look for an option which contradicts the author's prediction.

The author's prediction is that 'the very structure (of the start-ups) still might eventually push them toward overwhelming variety. The investors expect a steep growth rate that can't be achieved by selling one great mattress or one great sneaker. So, they will be forced to opt for variety.'

Option (A) states that they will see a surge in their sales without expanding their product catalogue.

Clearly, this is exactly the opposite of the author's prediction.

Hence, option (A) is the correct answer.

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

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

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

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

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

Answer: D

Solution:

Refer to para 2 and the concluding lines of the passage where the author gives the examples of Casper and Glossier.

In para 2, they have been cited as companies which have 'sprouted up to offer consumers freedom from choice.' 'The companies have a few aesthetically pleasing and supposedly highly functional options.'

In the concluding lines, the author mentions them to support his prediction that companies offering few options might be forced to increase their range as these companies did '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 colour cosmetics.'

So, option (D) best explains this—Casper and Glossier are examples of companies that changed into what they were exceptions to.

Hence, option (D) is the correct answer.

8. 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?

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

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

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

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

Answer: A

Solution:
The author's argument in the penultimate paragraph is—'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.'
The author feels that the choices available are not distributed evenly. The richer sections of the society get plenty of choices but the choices for the lower classes have shrunk.
So, he is likely to support more choices in the lower price ranges for the lower classes. From the given options, B and D are more expensive and can be eliminated.
A and C are both for ranges between $5 and $10 but C offers 25 products compared to 10 offered by A. Going with the author's claim that people make better choices with fewer options, A seems to be the optimum number.
Therefore, option (A) is the correct answer.

9. All of the following, IF TRUE, would weaken the author's claims EXCEPT which one?
A. Product options increased market competition, bringing down the prices of commodities, which, in turn, increased the purchasing power of the poor.
B. The annual sales growth of companies with fewer product options were higher than that of companies which curated their products for target consumers.
C. The annual sale of companies that hired lifestyle influencers on Instagram for marketing their products were 40% less than those that did not.
D. The empowerment felt by purchasers in buying a commodity were directly proportional to the number of options they could choose from.
Answer: B
Solution:
We have to look for an option which does not weaken the author's claim since it is an 'exception question'.
Three options will weaken the author's main contention.
Option (A) weakens the author's claim about the poorer classes. The author claims that 'opportunity to buy even basic things such as fresh food or quality diapers has contracted for much of America's lower classes. This will be weakened if the prices go down and the purchasing power of the poorer classes goes up.
Option (B) talks of companies with fewer product options having better sales growth. This fact does not weaken the author's claims.
Option (C) weakens the author's claims that 'choice fatigue is one reason why so many people gravitate toward lifestyle influencers on Instagram'—if companies with hired lifestyle influencers had a drop in sales, the claim is weakened.
Option (D) weakens the author's claim that people faced with fewer choices make better decisions and also weakens the claim that people experience a choice fatigue when overwhelmed with too many choices.

10. Based on the passage, all of the following can be inferred about consumer behaviour EXCEPT that:
A. too many options have made it difficult for consumers to trust products.
B. consumers are susceptible to marketing images that they see on social media.
C. having too many product options can be overwhelming for consumers.
D. consumers tend to prefer products by start-ups over those by established companies.

Answer: D

Solution:

Option (A) can be inferred from paragraphs 1 and 2—People are lost in the volume of choices available. They are experiencing choice fatigue. Some companies are offering fewer choices to give them freedom from choice. The author calls this 'selling a confidence'.

Option (B) can be inferred from the last few lines of para 1: '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.'

Option (C) can be inferred from the lines about choice fatigue and also the author's statement of choice anxiety—'...Americans have lost the ability to sort through the sheer volume of the consumer choices available to them.'

Option (D) cannot be inferred. It misrepresented the facts mentioned in the passage. The author mentions some start-ups have spring up offering fewer choices but nowhere is it mentioned that consumers prefer them to the ones offering more choices.

Hence, option (D) is correct.

Direction (Q11-14): Read the following discussion/passage and provide an appropriate answer for the questions that follow.

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.

11. In the last sentence of paragraph 3, 'slightly warmer air' and 'at a slightly colder temperature' refer to _____ AND _____, respectively.
A. 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
B. 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
C. 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
D. 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
Answer: D
Solution:
A quick reading of the lines of paragraph 3 of the passage will help answer the question.
The passage mentions that '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.'**
So, we can see that the slightly warmer air refers to the **cold antarctic air** and the same air cycles away after donating heat to the penguin 'at a slightly colder temperature'.
Hence, the answer is option (D).

12. Which of the following best explains the purpose of the word 'paradoxically' as used by the author?
A. Keeping their body colder helps penguins keep their plumage warmer.
B. Keeping a part of their body colder helps penguins keep their bodies warmer.
C. Heat gain through radiation happens despite the heat loss through convection.
D. Heat loss through radiation happens despite the heat gain through convection.
Answer: B
Solution:
Refer to the lines in the second paragraph where the author 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.'
The paradox is that penguins manage to extract some heat from the surrounding air by keeping their outer surface colder than the surroundings. This is best expressed in option (B).

13. All of the following, if true, would negate the findings of the study reported in the passage EXCEPT that:
A. the penguins' plumage was made of a material that did not allow any heat transfer through convection or radiation.
B. the average air temperature recorded during the month of June 2008 in the area of study was −10 degrees Fahrenheit.
C. 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.
D. the average temperature of the feet of penguins in the month of June 2008 were found to be 2.76 degrees Fahrenheit.
Answer: D
Solution:
This is an exception question. So, we have to look for an option which does not negate the findings.
The passage states that according to findings of studies, Emperor Penguins reduced loss of heat from their bodies by keeping the outer surface of their bodies slightly colder than the surroundings. They gain some heat through thermal convection through this process.
Option (A) would negate the findings since it states that no heat transfer takes place.
Option (B) would also negate the findings. If the average air temperature recorded during the month of June 2008 in the area of study were −10 degrees Fahrenheit and we take the temperatures of the the penguins' plumage on their heads, chests, and backs as −1.84, −7.24 and −9.76 degrees Fahrenheit (as mentioned in the next option), then the birds' plumage would be warmer and not cooler than the surrounding air. Then, the penguins will lose heat and not gain a small amount of heat. So, the findings of the study would be negated.
Option (C): If 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, then the plumage would be at a higher temperature than the surrounding air. This would result in heat loss for the penguins and go against the findings of the study.
Option (D) mentions the temperature of the feet of the penguins, while the studies were about the temperature of the plumage. So, this would not affect the findings. Hence, D is the correct answer.

14. Which of the following can be responsible for Emperor Penguins losing body heat?
A. Food metabolism
B. Reproduction process
C. Plumage
D. Thermal convection
Answer: B
Solution:
The answer to this question is in the last lines of the passage. Refer to the lines '...given the Emperors' unusually demanding breeding cycle, every bit of warmth counts. . . . 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.'
From these lines, we can infer that they lose body heat during the reproduction process.
Hence, option (B) is the correct answer.

Direction (Q15-19): Read the following discussion/passage and provide an appropriate answer for the questions that follow.

"Free of the taint of manufacture" – that phrase, in particular, is heavily loaded with the ideology of what the Victorian socialist William Morris called the "anti-scrape", or an anti- capitalist conservationism (not conservatism) that solaced itself with the vision of a pre- industrial golden age. In Britain, folk may often appear a cosy, fossilised form, but when you look more closely, the idea of folk – who has the right to sing it, dance it, invoke it, collect it, belong to it or appropriate it for political or cultural ends – has always been contested territory. . . .

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

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

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

15. The author says that folk 'may often appear a cosy, fossilised form' because:
A. of its nostalgic association with a pre-industrial past.
B. it has been arrogated for various political and cultural purposes.
C. folk is a sonic 'shabby chic' with an antique veneer.
D. the notion of folk has led to several debates and disagreements.
Answer: A
Solution:
In the first paragraph, the author states these lines about folk in Britain. In the statement before this, the author mentions the period as something that gave 'the vision of a pre-industrial golden age'.
Both the descriptions indicate that folk tends to be associated with a wonderful past.
Hence, option (A) is the correct answer.

16. All of the following are causes for plurality and diversity within the British folk tradition EXCEPT:
A. the fluidity of folk forms owing to their history of oral mode of transmission.
B. paradoxically, folk forms are both popular and unpopular.
C. that British folk forms can be traced to the remote past of the country.
D. that British folk continues to have traces of pagan influence from the dark ages.
Answer: B
Solution:
The author mentions many reasons for the plurality and diversity within British folk tradition. We have to look for an exception that is not a cause.
A reading of paragraphs 2 and 3 will give the answer to this question.
Option (A) has been mentioned in para 3. Refer to the lines '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.'
Option (B) is not a reason for the plurality and diversity; hence, it is the correct answer.
Options (C) and (D) have been mentioned in para 2 where the author states that 'elements of the uncanny and eerie, as well as an antique veneer, a whiff of Britain's heathen dark ages' and that 'the very obscurity and anonymity of folk music's origins open up space for rampant imaginative fancies.'
Hence, option (B) is correct.

17. At a conference on folk forms, the author of the passage is least likely to agree with which one of the following views?
A. The power of folk resides in its contradictory ability to influence and be influenced by the present while remaining rooted in the past.
B. Folk forms, despite their archaic origins, remain intellectually relevant in contemporary times.
C. Folk forms, in their ability to constantly adapt to the changing world, exhibit an unusual poise and homogeneity with each change.
D. The plurality and democratising impulse of folk forms emanate from the improvisation that its practitioners bring to it.
Answer: C
Solution:
An understanding of the main argument of the author will give the answer to this question. We have to find the option that the author is least likely to agree with. In other words, something that contradicts his views. Reading all the options, it is obvious that option (C) contradicts his views. The option mentions that folk forms exhibit 'homogeneity with every change', while the author mentions the plurality and diversity within folk as it transforms.
Hence, option (C) is the answer.

18. The primary purpose of the reference to William Morris and his floral prints is to show:
A. the pervasive influence of folk on contemporary art, culture, and fashion.
B. that what is once regarded as radical in folk, can later be seen as conformist.
C. that what was once derided as genteel is now considered revolutionary.
D. that despite its archaic origins, folk continues to remain a popular tradition.
Answer: B
Solution:
The question asks the purpose of an example—why has the author mentioned the example.
Refer to the lines where the author cites William Morris—Just as the effusive floral prints of the radical William Morris now cover genteel sofas, the revolutionary intentions of many folk historians and revivalists have led to music that is commonly regarded as parochial and conservative.'
The author gives the analogy of William Morris's floral prints being considered trendy to highlight how what was considered revivalist is now regarded as conservative. Or to use the words in the answer option (B), what was once regarded as radical is now regarded as conformist.
Hence, option (B) is correct.

19. Which of the following statements about folk revivalism of the 1940s and 1960s cannot be inferred from the passage?
A. Freedom and rebellion were popular themes during the second wave of folk revivalism.
B. Electrification of music would not have happened without the influence of rock music.
C. Even though it led to folk-rock's golden age, it wasn't entirely free from critique.
D. It reinforced Cecil Sharp's observation about folk's constant transformation

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Answer: B
Solution:
A reading of paras 3 and 4 will give the answer to this question. We have to look for an option which cannot be inferred.
Option (A) can be inferred from the lines '...starting in the 40s, the vital spark was communism's dream of a post-revolutionary New Jerusalem. For their younger successors in the 60s, who thronged the folk clubs set up by the old guard, the lyrical freedom of Dylan and the unchained melodies of psychedelia created the conditions for folk- rock's own golden age, a brief Indian summer that lasted from about 1969 to 1971.'
A quick check of the relevant lines of electrification shows that (option B) cannot be inferred and hence, is the right answer. Refer to the lines 'In the late 1960s, purists were suspicious of folk songs recast in rock idioms. Electrification, however, comes in many forms.'
The author said people were suspicious of electrification. But the option states something different. Electrification of music would not have happened without the influence of rock music.
This cannot be inferred. It might have happened with or without the influence of rock music.

Direction (Q20-24): Read the following discussion/passage and provide an appropriate answer for the questions that follow.
As defined by the geographer Yi-Fu Tuan, topophilia is the affective bond between people and place. His 1974 book set forth a wide-ranging exploration of how the emotive ties with the material environment vary greatly from person to person and in intensity, subtlety, and mode of expression. Factors influencing one's depth of response to the environment include cultural background, gender, race, and historical circumstance, and Tuan also argued that there is a biological and sensory element. Topophilia might not be the strongest of human emotions— indeed, many people feel utterly indifferent toward the environments that shape their lives— but when activated it has the power to elevate a place to become the carrier of emotionally charged events or to be perceived as a symbol.
Aesthetic appreciation is one way in which people respond to the environment. A brilliantly colored rainbow after gloomy afternoon showers, a busy city street alive with human interaction—one might experience the beauty of such landscapes that had seemed quite ordinary only moments before or that are being newly discovered. This is quite the opposite of a second topophilic bond, namely that of the acquired taste for certain landscapes and places that one knows well. When a place is home, or when a space has become the locus of memories or the means of gaining a livelihood, it frequently evokes a deeper set of attachments than those predicated purely on the visual. A third response to the environment also depends on the human senses but may be tactile and olfactory, namely a delight in the feel and smell of air, water, and the earth.
Topophilia—and its very close conceptual twin, sense of place—is an experience that, however elusive, has inspired recent architects and planners. Most notably, new urbanism seeks to counter the perceived placelessness of modern suburbs and the decline of central cities through neo-traditional design motifs. Although motivated by good intentions, such attempts to create places rich in meaning are perhaps bound

to disappoint. As Tuan noted, purely aesthetic responses often are suddenly revealed, but their intensity rarely is long- lasting. Topophilia is difficult to design for and impossible to quantify, and its most articulate interpreters have been self-reflective philosophers such as Henry David Thoreau, evoking a marvelously intricate sense of place at Walden Pond, and Tuan, describing his deep affinity for the desert.

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

20. The word 'topophobia' in the passage is used:
A. to represent a feeling of dread towards particular spaces and places.
B. as a metaphor expressing the failure of the homeland to accommodate non-citizens.
C. to signify the fear of studying the complex discipline of topography.
D. to signify feelings of fear or anxiety towards topophilic people.
Answer: A
Solution:
Refer to the concluding lines of the passage—'... 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'. This implies that topophobia is a fear of certain places.
From the lines, we can infer that Topophobia means fear, dread, or anxiety associated with a place. This is best expressed in option (A).
Hence, option (A) is correct.

21. In the last paragraph, the author uses the example of 'Residents of upscale residential developments' to illustrate the:
A. introduction of nationalist projects by such elites to produce a sense of dread or topophobia.
B. manner in which environments are designed to minimise the social exclusion of their clientele.
C. sensitive response to race and class problems in upscale residential developments.
D. social exclusivism practised by such residents in order to enforce a sense of racial or class superiority.
Answer: D
Solution:
A quick reading of the relevant section in the concluding paragraph of the passage will give us the answer to this question
Refer to the lines where the author states, '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.'

Thus, we can see that the author cites the residents of upscale residential complexes to highlight how Topophilia gives some people a sense of superiority of class or social status.

Option (D) expresses this best. Hence, it is the correct answer.

Option (A) is irrelevant as it talks of Topophobia.

Options (B) and (C) are contradictory to what has been stated in the passage.

22. Which one of the following best captures the meaning of the statement 'Topophilia is difficult to design for and impossible to quantify . . .'?

A. Philosopher-architects are uniquely suited to develop topophilic designs.

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

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

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

Answer: B

Solution:

Refer to the lines in the 3ʳᵈ paragraph from where the statement has been taken—'...purely aesthetic responses often are suddenly revealed, but their intensity rarely is long lasting'.

So, we can infer that Topophilia is an aesthetic response; hence, it is subjective. Also, it is sudden and short lived. So, it is difficult to design and impossible to measure or quantify.

This is expressed clearly in option (B).

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

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

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

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

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

Answer: B

Solution:

An understanding of the main theme of the passage along with a reading of the definition of topophilia will help identify the answer easily.

The author quotes Tuan's definition of Topophilia and states that 'topophilia is the affective bond between people and place'.

It is the attachment of a person with a place.

Option (A) is incorrect as it refers to language.

Option (B) shows the attachment of a person with a place and describes it as a familial relationship. Hence, this is the correct answer.

Options (C) and (D) are irrelevant as they talk of 'Topography' and 'Topophobia'.

24. Which of the following statements, if true, could be seen as not contradicting the arguments in the passage?
A. Generally speaking, in a given culture, the ties of the people to their environment vary little in significance or intensity.
B. Patriotism, usually seen as a positive feeling, is presented by the author as a darker form of topophilia.
C. New Urbanism succeeded in those designs where architects collaborated with their clients.
D. The most important, even fundamental, response to our environment is our tactile and olfactory response.

Answer: B
Solution:
We have to look for an option which aligns with the author's main arguments since the question asks us to find the option which doesn't contradict the arguments.
Option (A) contradicts the lines in the opening paragraph. The author states that 'the emotive ties with the material environment vary greatly from person to person and in intensity, subtlety, and mode of expression.'
Option B aligns with the author's arguments expressed in the concluding paragraph. Refer to the lines—'…but it often is useful to explore the darker affiliations between people and place. Patriotism, literally meaning the love of one's terra patria or homeland, has long been cultivated by governing elites for a range of nationalist projects, including war preparation and ethnic cleansing.
So, the author mentions patriotism in a negative context stating how patriotism has been used by elites in wars and ethnic cleansing. Hence, option (B) is correct.

25. **Direction:** 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.

Answer: 2341
Solution:
2 introduces the subject of mind-reading; hence, it is the starting sentence of the sequence.
3-4 is a pair as 3 states what mind-reading is like and 4 continues the theme talking about how print-reading and mind-reading both depend on certain parts of the brain and are affected by brain disorders.
1 follows 4 as it expands on the idea of brain disorders.
So, the paragraph sequence is 2341.

26. **Direction:** 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.
Answer: 4123
Solution:
Reading all the sentences in the jumble, it is clear that 4 is the starting sentence as it introduces the subject of the paragraph—Collaborative filtering.
1 follows as it mentions 'this collaborative filtering'.
2 is the next sentence as it talks of the problem with collaborative filtering and 3 follows it as it expands on the problem with an example.
Hence, the right order is 4123.

27. **Direction:** 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.
Answer: 3241
Solution:
After reading all the sentences in the jumble, it is clear that 3 starts the sequence— it introduces the subject that is legitimate criticism in social media conversations.
2-4 is a pair as 2 talks of one way to handle feedback and 4 talks of a new norm that will arise over repeated feedback on the same point.
1 clearly follows 4 as it states what will happen until 4 happens—'we will all live under mob rule until then…'
Hence, 3241 is the correct order.

28. **Direction:** 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.

Answer: 3241

Solution:

After reading all the sentences in the jumble, it is clear that 3-2 is a pair—3 starts the sequence by introducing the term Carpe Diem and its meaning.

2 follows 3 as it talks about the difference in this meaning and the original Latin meaning.

4 carries the theme forward by stating how 3-2 is an example of mistranslated metaphors and 1 sums up the passage on how subtle differences in meaning have a profound effect.

29. **Direction:** 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

A. 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.

B. 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.

C. 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.

D. 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.

Answer: B

Solution:
The passage is about Vance Packard's theory in The Hidden Persuaders and psychoanalytic techniques used by the advertising industry. According to Packard, advertising agencies identify hidden consumer motivations to entice consumers to buy goods.
Packard was not writing about subliminal advertising. He believed that individuals do not always have access to their conscious thoughts and can be persuaded by supraliminal messages without their knowledge.
These key points are best expressed in option (B).
Hence, option (B) is the correct choice.

30. **Direction:** 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.
A. Thoughts precede all speech acts and these thoughts pop up in our heads even in the absence of any stimulus.
B. The ability to think about objects not present in our environment precedes the development of human communication.
C. Thoughts are essential to communication and only humans have the ability to think about objects not present in their surroundings.
D. Displaced reference is particular to humans and thoughts pop into our heads for no real reason.
Answer: B
Solution:
The passage is about displaced reference in language. The ability to think about distant things which preceded the ability to talk about them. Thought precedes meaningful referential communication.
Option (A) is incorrect. It mentions 'speech acts' which has not been mentioned in the passage.
Option (B) captures the main points best.
Options (C) and (D) mention points which have not been stated in the passage.
Hence, option (B) is the answer.

31. **Direction:** 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 behavior of matter without regard to whether it will afford any practical benefit. Engineering is the correlative applied science in which physical theories are put to some specific use, such as building a bridge or a nuclear reactor. Engineers obviously rely heavily on the discoveries of physicists, but an engineer's knowledge of the world is not the same as the physicist's knowledge. In fact, an engineer's know-how will often depend on

physical theories that, from the point of view of pure physics, are false. There are some reasons for this. First, theories that are false in the purest and strictest sense are still sometimes very good approximations to the true ones, and often have the added virtue of being much easier to work with. Second, sometimes the true theories apply only under highly idealized conditions which can only be created under controlled experimental situations. The engineer finds that in the real world, theories rejected by physicists yield more accurate predictions than the ones that they accept.

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

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

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

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

Answer: C

Solution:

The passage is about the relationship between pure science and Engineering. Engineering is the applied science in which physical theories are put to some specific use. Engineers rely on the discoveries of physicists, but an engineer's knowledge of the world is not the same as the physicist's knowledge.

An engineer's know-how will often depend on physical theories that, from the point of view of pure physics, are false. The engineer finds that in the real world, theories rejected by physicists yield more accurate predictions than the ones that they accept. Option (C) best captures these points.

32. **Direction:** 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.

Answer: 2

2 is the odd one out. The other sentences on the atrocities faced by deaf people form a coherent paragraph in the order 5341.

Option 2 on Aristotle's observation on deaf people is out of context.

33. **Direction:** 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.

Answer: 1

Solution:

The overall theme of the passage is about organizations and how identity affects organizational performance.

The sentence that does not fit the theme is 1 which talks about actors that don't fit within a single category.

34. **Direction:** 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) '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.

Answer: 2

Solution:

The overall theme of the passage is what terms in science and technology symbolize.

The correct order of sentences is 4315.

Option 2 is the odd one out as it is about high modernism.

Slot-1 DILR

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

1) A and B are to be placed in consecutively numbered shelves in increasing order.
2) I and J are to be placed in consecutively numbered shelves both higher numbered than the shelves in which A and B are kept.
3) D, E and F are savouries and are to be placed in consecutively numbered shelves in increasing order after all the biscuits and candies.
4) K is to be placed in shelf number 16.
5) L and J are items of the same type, while H is an item of a different type.
6) C is a candy and is to be placed in a shelf preceded by two empty shelves.
7) L is to be placed in a shelf preceded by exactly one empty shelf.
|||End|||

In how many different ways can the items be arranged on the shelves?
A. 2
B. 4
C. 1
D. 8

Answer ||| D
Solution |||
We can put I, J in biscuits interchangeably and G, H in candies interchangeably. Therefore, we obtain 4 cases for each of the above cases and the total ways in which items can be arranged on the shelves is 8.
The correct option is D.
All items of the same type are clustered together. Hence, from points 3 and 4 we can say that K is also a savoury and D, E, F, and K can be placed in the top four shelves in increasing order.
From point 5 and 6, L, J, and I belong to the same group and H belongs to the remaining group.
Form point 6, C is a candy. Since there are only three candies, it cannot belong to the group of L, J, and I as they are already three in number. Hence, the group of candies are C, H, and G.
The remaining group of L, J, I, A, and B belongs to biscuits.
Since L is the starting shelf of biscuits and from point 1 and 2 we can place L, A, and B in increasing order below I and J.
Thus, we obtain the following table:

Shelf number	Case 1	Items	Case 2	Items
16	K	savouries	K	savouries
15	F		F	
14	E		E	
13	D		D	
12				
11	J/I	Biscuits	G/H	Candies
10	I/J		H/G	
9	B		C	
8	A			
7	L			
6		Candies	J/I	Biscuits
5	G/H		I/J	
4	H/G		B	
3	C		A	
2			L	
1				

2.Which of the following items is not a type of biscuit?

A. G

B. A

C. B

D. L

Answer ||| A

Solution |||

From the table it is clear that from the given options G is not a biscuit.

The correct option is A.

All items of the same type are clustered together. Hence, from points 3 and 4 we can say that K is also a savoury and D, E, F, and K can be placed in the top four shelves in increasing order.

From point 5 and 6, L, J, and I belongs to the same group and H belongs to the remaining group.

Form point 6, C is a candy. Since there are only three candies, it cannot belong to the group of L, J, and I as they are already three in number. Hence, the group of candies are C, H, and G.

The remaining group of L, J, I, A, and B belongs to bBiscuits.

Since L is the starting shelf of biscuits and from point 1 and 2 we can place L, A, and B in increasing order below I and J.

Thus, we obtain the following table:

Shelf number	Case 1	Items	Case 2	Items
16	K	savouries	K	savouries
15	F		F	
14	E		E	
13	D		D	
12				
11	J/I	Biscuits	G/H	Candies
10	I/J		H/G	
9	B		C	
8	A			
7	L			
6		Candies	J/I	Biscuits
5	G/H		I/J	
4	H/G		B	
3	C		A	
2			L	
1				

3.Which of the following can represent the numbers of the empty shelves in a possible arrangement?
A. 1,2,6,12
B. 1,2,8,12
C. 1,5,6,12
D. 1,7,11,12

Answer ||| A
Solution |||
From the table we can say that from the given options shelves 1,2,6,and 12 represent the numbers of the empty shelves in a possible arrangement.
The correct option is A.
All items of the same type are clustered together. Hence, from points 3 and 4 we can say that K is also a savoury and D, E, F, and K can be placed in the top four shelves in increasing order.
From point 5 and 6, L, J, and I belongs to the same group and H belongs to the remaining group.
Form point 6, C is a candy. Since there are only three candies, it cannot belong to the group of L, J, and I as they are already three in number. Hence, the group of candies are C, H, and G.
The remaining group of L, J, I, A, and B belongs to bBiscuits.
Since L is the starting shelf of biscuits and from point 1 and 2 we can place L, A, and B in increasing order below I and J.
Thus, we obtain the following table:
Thus, we obtain the following table:

Shelf number	Case 1	Items	Case 2	Items
16	K		K	
15	F	savouries	F	savouries
14	E		E	
13	D		D	
12				
11	J/I		G/H	
10	I/J		H/G	Candies
9	B	Biscuits	C	
8	A			
7	L			
6			J/I	
5	G/H		I/J	
4	H/G	Candies	B	Biscuits
3	C		A	
2			L	
1				

4.Which of the following statements is necessarily true?
A. There are two empty shelves between the biscuits and the candies.
B. All biscuits are kept before candies.
C. All candies are kept before biscuits.
D. There are at least four shelves between items B and C.

Answer ||| D
Solution |||
From the table we cannot conclude the options 1,2, and 3 with surety as they are depicted in a only few cases. On the other hand, we can confirm that the number of shelves between items B and C will be at least four because in all the cases the items B and C will be in either shelves 3 and 9 or in shelves 4 and 9.

The correct option is D.

All items of the same type are clustered together. Hence, from points 3 and 4 we can say that K is also a savoury and D, E, F, and K can be placed in the top four shelves in increasing order.

From point 5 and 6, L, J, and I belongs to the same group and H belongs to the remaining group.

Form point 6, C is a candy. Since there are only three candies, it cannot belong to the group of L, J, and I as they are already three in number. Hence, the group of candies are C, H, and G.

The remaining group of L, J, I, A, and B belongs to bBiscuits.

Since L is the starting shelf of biscuits and from point 1 and 2 we can place L, A, and B in increasing order below I and J.

Thus, we obtain the following table:

Shelf number	Case 1	Items	Case 2	Items
16	K		K	
15	F	savouries	F	savouries
14	E		E	
13	D		D	
12				
11	J/I		G/H	
10	I/J		H/G	Candies
9	B	Biscuits	C	
8	A			
7	L			
6			J/I	
5	G/H		I/J	
4	H/G	Candies	B	Biscuits
3	C		A	
2			L	
1				

5. **Direction:** 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
|||End|||
What was the highest total score?
A. 21
B. 23
C. 25
D. 24

Answer ||| C
Solution |||
The correct option is C
The total number of bull's eyes in the first three rounds are 9. We can calculate it by calculating the number of shoots in round 4, 5, and 6.
Since Xyla played all the six rounds and we know that hitting 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, we can say that Xyla scored a bull's eye in all the first three rounds.
Tanzi has scored one bull's eye in the first three rounds and from point 5, Tanzi and Zeneca hit the bull's eye in round 1 because had Tanzi hit a bull's eye in round 3 then Zeneca would have hit the bull's eye in round 1 and this would have violated the condition that both have the same score in the first round.

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

Number of bull's eyes in all rounds to satisfy the condition of point 4 are (6,2,1) or (3,4,2).. Wangdu does not hit any bull's eye, the case (6,2,1) can be eliminated and the number of bull's eyes in rounds 1, 2, and 3 are 3, 4, and 2 respectively. Hence, Umeza, Yonita, and Zeneca also hit bull's eye in round 2 as four people hit bull's eye in round 2. Moreover, we can also say that Umeza hit the bull's eye in round 3 as round one.

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

The following table shows the range of scores of 6 players.

	Range
Tanzi	15-18
Umeza	14-17
Wangdu	6-12
Xyla	22-25
Yonita	14-17
Zeneca	21-24

From given point 1 and 2, the total scores of Tanzi, Umeza, and Yonita was 15 as only one of them can have a score which is not a multiple of 3. Now we also can fill up the scores of these three for remaining rounds.

	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		NP	NP	NP	
Xyla	5	5	5	1	5		
Yonita	3	5	3	5	NP	NP	15
Zeneca	5	5		5	5	NP	

The lowest possible score is 12 (of Wangdu) as any score below that would raise the following problems:
If the lowest score is 11: according to point 3 highest would be 23 and then point 2 would be violated
If the lowest score is 10: according to point 3 highest score would be 21 and that is not possible as Xyla has a range of score 22-25.
Since lowest score is 12 therefore according to point 3 highest score would be 25 and that is possible only for Xyla. Further, Zeneca's total score is 24 as it should be a multiple of 3 and it cannot be 21 as she cannot score 1 in round 3 because of point 5.

	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	3	5	3	5	NP	NP	15
Zeneca	5	5	4	5	5	NP	24

From the table we can say that the highest total score is 25.

6.What was Zeneca's total score?
A. 24
B. 22
C. 23
D. 21

Answer ||| A

29

Solution |||
From the above derived table Zeneca's total score is 24.
The correct option is A
The total number of bull's eyes in the first three rounds are 9. We can calculate it by calculating the number of shoots in round 4, 5 and 6.
Since Xyla played all the six rounds and we know that hitting 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, we can say that Xyla scored bull's eye in all the first three rounds.
Tanzi has scored one bull's eye in first three rounds and from point 5, Tanzi and Zeneca hit the bull's eye in round 1 because had Tanzi hit a bull's eye in round 3 then Zeneca would have hit the bull's eye in round 1 and this would have violated the condition that both have same score in first round.

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

Number of bull's eyes in all rounds to satisfy the condition of point 4 are (6,2,1) or (3,4,2).. Wangdu does not hit any bull's eye, the case (6,2,1) can be eliminated and the number of bull's eyes in each round 1, 2, and 3 are 3, 4 and 2 respectively. Hence, Umeza, Yonita and Zeneca also hit bull's eye in round 2 as four people who hit bull's eye in round 2. Moreover, we can also say that Umeza hit the bull's eye in round 3 as round one.

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

The following table shows the range of scores of 6 players.

	Range
Tanzi	15-18
Umeza	14-17
Wangdu	6-12
Xyla	22-25
Yonita	14-17
Zeneca	21-24

From points 1 and 2, the total scores of Tanzi, Umeza and Yonita was 15 as only one of them can have a score which is not a multiple of 3. Now we also can fill up the scores of these three for the remaining rounds.

	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		NP	NP	NP	
Xyla	5	5	5	1	5		
Yonita	3	5	3	5	NP	NP	15
Zeneca	5	5		5	5	NP	

The lowest possible score is 12 of Wangdu as below that would raise the following problems:

If the lowest score is 11: according to point 3 highest would be 23 and then point 2 would be violated

If the lowest score is 10: according to point 3 the highest score would be 21 and that is not possible as Xyla has a range of score 22-25.

Since the lowest score is 12 therefore according to point 3 the highest score would be 25 and that is possible only for Xyla. Further, Zeneca's total score is 24 as it should be a multiple of 3 and it cannot be 21 as she cannot score 1 in round 3 because of point 5.

	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	3	5	3	5	NP	NP	15
Zeneca	5	5	4	5	5	NP	24

7.Which of the following statements is true?
A. Xyla's score was 23
B. Xyla was the highest scorer.
C. Zeneca was the highest scorer.
D. Zeneca's score was 23

Answer ||| B
Solution |||
From the above derived table we can say that Xyla was the highest scorer.
The correct option is B
The total number of bull's eyes in the first three rounds are 9. We can calculate it by calculating the number of shoots in round 4, 5, and 6.
Since Xyla played all the six rounds and we know that hitting 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, we can say that Xyla scored bull's eye in all the first three rounds.
Tanzi has scored one bull's eye in first three rounds and from point 5, Tanzi and Zeneca hit the bull's eye in round 1 because had Tanzi hit a bull's eye in round 3 then Zeneca would have hit the bull's eye in round 1 and this would have violated the condition that both have same score in first round.

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

Number of bull's eyes in all rounds to satisfy the condition of point 4 are (6,2,1) or (3,4,2). Wangdu does not hit any bull's eye, the case (6,2,1) can be eliminated and the number of bull's eyes in each round 1, 2, and 3 are 3, 4 and 2 respectively. Hence, Umeza, Yonita and Zeneca also hit bull's eye in round 2 as four people who

hit bull's eye in round 2. Moreover, we can also say that Umeza hit the bull's eye in round 3 as round one.

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

The following table shows the range of scores of 6 players.

	Range
Tanzi	15-18
Umeza	14-17
Wangdu	6-12
Xyla	22-25
Yonita	14-17
Zeneca	21-24

From points 1 and 2, the total scores of Tanzi, Umeza and Yonita was 15 as only one of them can have a score which is not a multiple of 3. Now we also can fill up the scores of these three for the remaining rounds.

	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		NP	NP	NP	
Xyla	5	5	5	1	5		
Yonita	3	5	3	5	NP	NP	15
Zeneca	5	5		5	5	NP	

The lowest possible score is 12 of Wangdu as below that would raise the following problems:

If the lowest score is 11: according to point 3 highest would be 23 and then point 2 would be violated

If the lowest score is 10: according to point 3 the highest score would be 21 and that is not possible as Xyla has a range of score 22-25.

Since the lowest score is 12 therefore according to point 3 the highest score would be 25 and that is possible only for Xyla. Further, Zeneca's total score is 24 as it should be a multiple of 3 and it cannot be 21 as she cannot score 1 in round 3 because of point 5.

	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	3	5	3	5	NP	NP	15
Zeneca	5	5	4	5	5	NP	24

8.What was Tanzi's score in Round 3?
A. 5
B. 3
C. 4
D. 1

Answer ||| D
Solution |||
From the table we can say that Tanzi's score in round 3 was 1.
The correct option is D
The total number of bull's eyes in the first three rounds are 9. We can calculate it by calculating the number of shoots in round 4, 5 and 6.
Since Xyla played all the six rounds and we know that hitting 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, we can say that Xyla scored bull's eye in all the first three rounds.
Tanzi has scored one bull's eye in first three rounds and from point 5, Tanzi and Zeneca hit the bull's eye in round 1 because had Tanzi hit a bull's eye in round 3 then Zeneca would have hit the bull's eye in round 1 and this would have violated the condition that both have same score in first round.

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

Number of bull's eyes in all rounds to satisfy the condition of point 4 are (6,2,1) or (3,4,2).. Wangdu does not hit any bull's eye, the case (6,2,1) can be eliminated and the number of bull's eyes in each round 1, 2, and 3 are 3, 4 and 2 respectively. Hence, Umeza, Yonita and Zeneca also hit bull's eye in round 2 as four people who hit bull's eye in round 2. Moreover, we can also say that Umeza hit the bull's eye in round 3 as round one.

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

The following table shows the range of scores of 6 players.

	Range
Tanzi	15-18
Umeza	14-17
Wangdu	6-12
Xyla	22-25
Yonita	14-17
Zeneca	21-24

From points 1 and 2, the total scores of Tanzi, Umeza and Yonita was 15 as only one of them can have a score which is not a multiple of 3. Now we also can fill up the scores of these three for the remaining rounds.

	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		NP	NP	NP	
Xyla	5	5	5	1	5		
Yonita	3	5	3	5	NP	NP	15
Zeneca	5	5		5	5	NP	

The lowest possible score is 12 of Wangdu as below that would raise the following problems:

If the lowest score is 11: according to point 3 highest would be 23 and then point 2 would be violated

If the lowest score is 10: according to point 3 the highest score would be 21 and that is not possible as Xyla has a range of score 22-25.

Since the lowest score is 12 therefore according to point 3 the highest score would be 25 and that is possible only for Xyla. Further, Zeneca's total score is 24 as it should be a multiple of 3 and it cannot be 21 as she cannot score 1 in round 3 because of point 5.

	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	3	5	3	5	NP	NP	15
Zeneca	5	5	4	5	5	NP	24

9. **Direction:** 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.
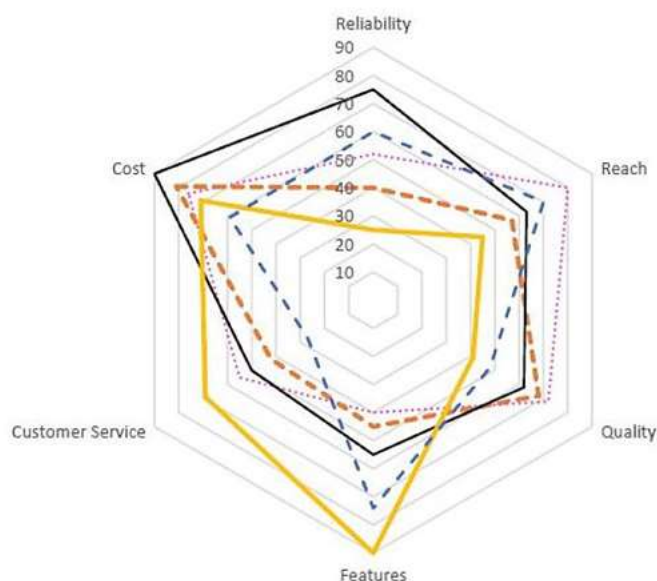
On which aspect is the median score of the five vendors the least?
A. Customer Service
B. Reliability
C. Quality
D. Cost

Answer ||| A
Solution |||
From the following table we can say that the least median score of the five vendors is in Customer Service.
The correct option is A

	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Median score
Reliability	52	40	75	26	60	60
Cost	76	80	90	70	60	76
Customer Service	56	41	50	70	28	50
Features	40	45	55	90	75	55
Quality	71	69	61	40	49	61
Reach	80	58	62	45	70	62
Total	**375**	**333**	**393**	**341**	**342**	

10.A vendor's final score is the average of their scores on all six aspects. Which vendor has the highest final score?
A. Vendor 3
B. Vendor 2
C. Vendor 4
D. Vendor 1

Answer ||| A
Solution |||
From the table we can say that Vendor 3 had the highest final score.
The correct option is A

	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Median score
Reliability	52	40	75	26	60	60
Cost	76	80	90	70	60	76
Customer Service	56	41	50	70	28	50
Features	40	45	55	90	75	55
Quality	71	69	61	40	49	61
Reach	80	58	62	45	70	62
Total	**375**	**333**	**393**	**341**	**342**	

11.List of all the vendors who are among the top two scorers on the maximum number of aspects is:
A. Vendor 1 and Vendor 5
B. Vendor 1 and Vendor 2
C. Vendor 2 and Vendor 5
D. Vendor 2, Vendor 3, and Vendor 4

Answer ||| A
Solution |||

From the table we can say that Vendor 1 and Vendor 5 are among the top two scorers on the maximum number of aspects.
The correct option is A

	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Median score
Reliability	52	40	75	26	60	60
Cost	76	80	90	70	60	76
Customer Service	56	41	50	70	28	50
Features	40	45	55	90	75	55
Quality	71	69	61	40	49	61
Reach	80	58	62	45	70	62
Total	**375**	**333**	**393**	**341**	**342**	

12. List of all the vendors who are among the top three vendors on all six aspects is:
A. Vendor 1 and Vendor 3
B. Vendor 1
C. None of the Vendors
D. Vendor 3

Answer ||| D
Solution |||
From the table we can say that Vendor 3 is among the top three vendors on all six aspects.
The correct option is D

	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Median score
Reliability	52	40	75	26	60	60
Cost	76	80	90	70	60	76
Customer Service	56	41	50	70	28	50
Features	40	45	55	90	75	55
Quality	71	69	61	40	49	61
Reach	80	58	62	45	70	62
Total	**375**	**333**	**393**	**341**	**342**	

13. **Direction:** 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

|||End|||
Which digit does the letter A represent?
Answer ||| 1
Solution |||
A represents 1.
The correct answer is 1.
Step 1 – F + F = F. Hence, F = 0

Step 2 – The value of H is 5 because only by adding 5 to itself we get the units digit as 0 with 1 getting carry forwarded.

Step 3 – When we add any six-digit number to a six-digit number and we get a seven digit number then that seventh digit will always be 1.

Step 4 –The value of B would be 9 because only by adding 9 to 1 with 1 carry forward can make the sum as 11.

Step 5 – The value of C would be 2 because adding 1 and 0 with carry forward 1 we get the sum as 2.

Step 6 – G + K = 11 and 1 + J = G.

Since 9, 2, and 5 are already taken by B, C, and H, the value of G, K would be either 3,8 or 4,7.

Step 7 – Let's put the values and make the cases.

9511_0 + 15_0_0 = 110_210

951130 + 15_080 = 1103210 : Not possible as we cannot put the value of the remaining as 2 because we already have C as 2.

951180 + 157030 = 1108210 : Possible

951140 + 153070 = 1104210 : Possible

951170 + 156040 = 1107210 : Possible

Letter	Digit
A	1
B	9
C	2
F	0
G	
H	5
J	
K	

14. Which digit does the letter B represent?

Answer ||| 9

Solution |||

The value of B is 9

The correct answer is 9.

Step 1 – F + F = F. Hence, F = 0

Step 2 – The value of H is 5 because only by adding 5 to itself we get the units digit as 0 with 1 getting carry forwarded.

Step 3 – When we add any six-digit number to a six-digit number and we get a seven digit number then that seventh digit will always be 1.

Step 4 –The value of B would be 9 because only by adding 9 to 1 with 1 carry forward can make the sum as 11.

Step 5 – The value of C would be 2 because adding 1 and 0 with carry forward 1 we get the sum as 2.

Step 6 – G + K = 11 and 1 + J = G.

Since 9, 2 and 5 are already taken by B, C and H, the value of G, K would be either 3,8 or 4,7.

Step 7 – Let's put the values and make the cases

9511_0 + 15_0_0 = 110_210

951130 + 15_080 = 1103210 : Not possible as we cannot put the value of the remaining as 2 because we already have C as 2.

951180 + 157030 = 1108210 : Possible
951140 + 153070 = 1104210 : Possible
951170 + 156040 = 1107210 : Possible

Letter	Digit
A	1
B	9
C	2
F	0
G	
H	5
J	
K	

15. Which among the digits 3, 4, 6, and 7 cannot be represented by the letter D?
Answer ||| 7
Solution |||
From the given explanation we can see that digit 7 is there in every case, therefore the letter D cannot be represented by 7.
The correct answer is 7.
Step 1 – F + F = F. Hence, F = 0
Step 2 – The value of H is 5 because only by adding 5 to itself we get the units digit as 0 with 1 getting carry forwarded.
Step 3 – When we add any six-digit number to a six-digit number and we get a seven digit number then that seventh digit will always be 1.
Step 4 –The value of B would be 9 because only by adding 9 to 1 with 1 carry forward can make the sum as 11.
Step 5 – The value of C would be 2 because adding 1 and 0 with carry forward 1 we get the sum as 2.
Step 6 – G + K = 11 and 1 + J = G.
Since 9, 2 and 5 are already taken by B, C and H, the value of G, K would be either 3,8 or 4,7.
Step 7 – Let's put the values and make the cases
9511_0 + 15_0_0 = 110_210
951130 + 15_080 = 1103210 : Not possible as we cannot put the value of the remaining as 2 because we already have C as 2.
951180 + 157030 = 1108210 : Possible
951140 + 153070 = 1104210 : Possible
951170 + 156040 = 1107210 : Possible

Letter	Digit
A	1
B	9
C	2
F	0
G	
H	5
J	
K	

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

Answer ||| 6

Solution |||

From the given explanation in 14th question we can see that digit 6 cannot be represented by letter G.

The correct answer is 6.

Step 1 – F + F = F. Hence, F = 0

Step 2 – The value of H is 5 because only by adding 5 to itself we get the units digit as 0 with 1 getting carry forwarded.

Step 3 – When we add any six-digit number to a six-digit number and we get a seven digit number then that seventh digit will always be 1.

Step 4 –The value of B would be 9 because only by adding 9 to 1 with 1 carry forward can make the sum as 11.

Step 5 – The value of C would be 2 because adding 1 and 0 with carry forward 1 we get the sum as 2.

Step 6 – G + K = 11 and 1 + J = G.

Since 9, 2 and 5 are already taken by B, C and H, the value of G, K would be either 3,8 or 4,7.

Step 7 – Let's put the values and make the cases

9511_0 + 15_0_0 = 110_210

951130 + 15_080 = 1103210 : Not possible as we cannot put the value of the remaining as 2 because we already have C as 2.

951180 + 157030 = 1108210 : Possible

951140 + 153070 = 1104210 : Possible

951170 + 156040 = 1107210 : Possible

Letter	Digit
A	1
B	9
C	2
F	0
G	
H	5
J	
K	

17. **Direction:** 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.
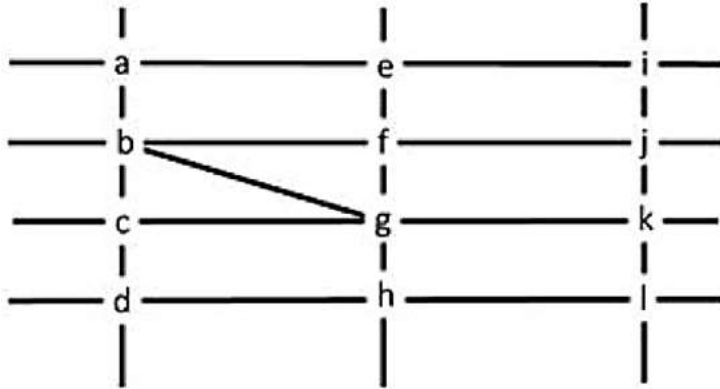
Six people U, V, W, X, Y, and Z, are standing at different intersections. No two people are standing at the same intersection.
The following additional facts are known.
1) X, U, and Z are standing at the three corners of a triangle formed by three street segments.
2) X can see only U and Z.
3) Y can 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.
|||End|||
Who is standing at intersection a?
A. Y
B. V
C. No one
D. W

Answer ||| C
Solution |||
There is no one standing at intersection a.
The correct option is C
From given point 1, 2, and 4 there are two possibilities of X, U, Z, and V position:
i) X, U, Z, and V are at b, g, f, and e respectively.
ii) X, U, Z, and V are at g, b, f, and j respectively.
For satisfying statements 2, 3, 5, and 6 we can place W and Y in the above two cases as:
i) Position of W and Y can be at l and k respectively.
ii) Not possible
Hence, the positions of U, V, W, X, Y, and Z are g, e, l, b, k, and f respectively.

18.Who can V see?
A. U only
B. U, W, and Z only
C. Z only
D. U and Z only

Answer ||| D

Solution |||
V can see only U and Z.
The correct option is D
From given point 1, 2 and 4 there are two possibilities of X, U, Z and V position:
From given point 1, 2, and 4 there are two possibilities of X, U, Z, and V position:
i) X, U, Z, and V are at b, g, f, and e respectively.
ii) X, U, Z, and V are at g, b, f, and j respectively.
For satisfying statements 2, 3, 5, and 6 we can place W and Y in the above two cases as:
i) Position of W and Y can be at l and k respectively.
ii) Not possible
Hence, the positions of U, V, W, X, Y, and Z are g, e, l, b, k, and f respectively.

19.What is the minimum number of street segments that X must cross to reach Y?
A. 2
B. 4
C. 3
D. 1

Answer ||| A
Solution |||
The minimum number of streets that X must cross to reach Y is 2, i.e., from X to U then from U to Y.
The correct option is A
From given point 1, 2 and 4 there are two possibilities of X, U, Z and V position:
i) X, U, Z and V are at b, g, f, and e respectively.
ii) X, U, Z and V are at g, b, f, and j respectively
In the next step we will eliminate one of the above cases.
For satisfying statements 2, 3, 5, and 6 we can place W and Y in the above two cases as:
i) Position of W and Y can be at l and k respectively.
ii) Not possible
Hence, the positions of U, V, W, X, Y, and Z are g, e, l, b, k, f respectively.

20.Should a new person stand at intersection d, who among the six would she see?
A. U and Z only
B. U and W only
C. V and X only
D. W and X only

Answer ||| D
Solution |||
If a new person stands at intersection d then she would see only W and X.
The correct option is D.
From given point 1, 2 and 4 there are two possibilities of X, U, Z and V position:
i) X, U, Z and V are at b, g, f and e respectively.
ii) X, U, Z and V are at g, b, f and j respectively
In next step we will eliminate one of the above cases.

For satisfying statements 2, 3, 5 and 6 we can place W and Y in the above two cases as:
i) Position of W and Y can be at l and k respectively.
ii) Not possible
Hence, the positions of U, V, W, X, Y, and Z are g, e, l, b, k, f respectively.

Data Interpretation||Mixed Charts and Graphs||Mixed Charts and Graphs
21. **Direction:** 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.
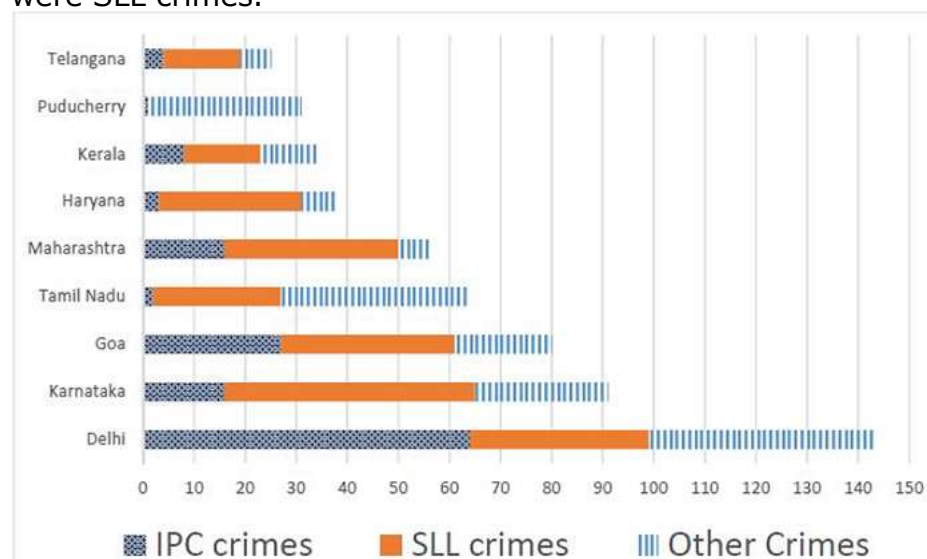
The table below shows the ranks of the ten states/UTs mentioned above among ALL states/UTs of India in terms of the number of cases registered in each of the three category of crimes. A state/UT is given rank r for a category of crimes if there are (r-1) states/UTs having a larger number of cases registered 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

|||End|||

What is the rank of Kerala in the 'IPC crimes' category?

Answer ||| 5

Solution |||

The rank of Kerala in 'IPC crimes' category is 5.

The correct answer is 5

Let's make a table with approximate figures derived from the graph

State	IPC	SLL	Others	Total
Telangana	4	15	6	25
Puducherry	1	-	30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	16	35	6	57
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	44	26	91
Delhi	63	34	45	142
West Bengal	-	520	-	520

22. 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

A. 11:10

B. 1:9

C. 3:2

D. 19:20

Answer ||| B

Solution |||

The two states where the highest total number of crimes are registered are West Bengal and Delhi. Total number of IPC crimes and SLL crimes in these states are 63 and 554 respectively. From the given options, these numbers are closest to the ratio 1:9.

The correct option is B

Let's make a table with approximate figures derived from the graph

State	IPC	SLL	Others	Total
Telangana	4	15	6	25
Puducherry	1	-	30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	16	35	6	57
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	44	26	91
Delhi	63	34	45	142
West Bengal	-	520	-	520

23.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
A. neither i) , nor ii)
B. both i) and ii)
C. only i)
D. only ii)

Answer ||| B
Solution |||
The ranks of Tamil Nadu and Puducherry in the 'other crimes' category are 2 and 3 respectively. Hence, both i) and ii) are correct.
The correct option is B
Let's make a table with approximate figures derived from the graph

State	IPC	SLL	Others	Total
Telangana	4	15	6	25
Puducherry	1	-	30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	16	35	6	57
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	44	26	91
Delhi	63	34	45	142
West Bengal	-	520	-	520

24.What is the sum of the ranks of Delhi in the three categories of crimes?
Answer ||| 5
Solution |||
Delhi has 1st, 3rd, and 1st ranks on IPC crime, SLL crime, and other crimes respectively. Hence, the sum of ranks of Delhi are 1 + 3 + 1 = 5
The correct answer is 5

State	IPC	SLL	Others	Total
Telangana	4	15	6	25
Puducherry	1	-	30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	16	35	6	57
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	44	26	91
Delhi	63	34	45	142
West Bengal	-	520	-	520

###TOPIC###Data Interpretation||Mixed Charts and Graphs||Mixed Charts and Graphs###

25. **Direction:** 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.

|||End|||

Which of the following is true?
A. The third performance was composed by Dyu.
B. The second performance was composed by Dyu.
C. The second performance was composed by Gagan.
D. The third performance was composed by Ashman.

Answer ||| B
Solution |||
The second performance was composed by Dyu.
The correct option is B
From point (iii) and (iv), the first and last performances were by Princess and Rani respectively and their composers were Badal and Gagan respectively.
The sequence of performance is the same in the second round. Hence, the fourth and fifth performances were by Rani and Princess.
From point (v), Ashman was the composer in fourth and fifth performance as all dancers performed with different composers for the first time.

Performance number	Dancer	Composer
1	Princess	Badal
2		
3		
4	Rani	Ashman
5	Princess	Ashman
6		
7		
8	Rani	Gagan

The number of performances between items assigned by each of the remaining composers apart from Ashman was the same.

The sixth performance was assigned by Badal and third performance was assigned by Gagan. Hence, the second and seventh performances were assigned by Dyu. The difference between all the performances assigned by a single composer was 4.

From point (i) Badal and Ashman cannot assign items to Queen and in the second round even Gagan has already assigned to Rani. Hence, Queen was assigned to Dyu and her performance was number seven.

The remaining dancer in the second round is Samragni. Her performance number is sixth.

Since the order of performance is same in both the rounds, therefore, we get the whole following table:

Performance number	Dancer	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

26. Which of the following is FALSE?
A. Queen did not perform in any item composed by Gagan.
B. Rani did not perform in any item composed by Badal.
C. Samragni did not perform in any item composed by Ashman.
D. Princess did not perform in any item composed by Dyu.

Answer ||| A
Solution |||
All the statements are correct except the first one which states that Queen did not perform in any item composed by Gagan.
The correct option is A
From point (iii) and (iv), the first and last performances were by Princess and Rani respectively and their composers were Badal and Gagan respectively.

The sequence of performance is the same in the second round. Hence, the fourth and fifth performances were by Rani and Princess.

From point (v), Ashman was the composer in fourth and fifth performance as all dancers performed with different composers for the first time.

Performance number	Dancer	Composer
1	Princess	Badal
2		
3		
4	Rani	Ashman
5	Princess	Ashman
6		
7		
8	Rani	Gagan

The number of performances between items assigned by each of the remaining composers apart from Ashman was the same.

The sixth performance was assigned by Badal and third performance was assigned by Gagan. Hence, the second and seventh performances were assigned by Dyu. The difference between all the performances assigned by a single composer was 4.

From point (i) Badal and Ashman cannot assign items to Queen and in the second round even Gagan has already assigned to Rani. Hence, Queen was assigned to Dyu and her performance was number seven.

The remaining dancer in the second round is Samragni. Her performance number is sixth.

Since the order of performance is same in both the rounds, therefore, we get the whole following table:

Performance number	Dancer	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

27.The sixth performance was composed by:
A. Gagan
B. Ashman
C. Badal
D. Dyu

Answer ||| C
Solution |||
The sixth performance was composed by Badal.
The correct option is C.
From point (iii) and (iv), the first and last performances were by Princess and Rani respectively and their composers were Badal and Gagan respectively.

The sequence of performance is the same in the second round. Hence, the fourth and fifth performances were by Rani and Princess.

From point (v), Ashman was the composer in fourth and fifth performance as all dancers performed with different composers for the first time.

Performance number	Dancer	Composer
1	Princess	Badal
2		
3		
4	Rani	Ashman
5	Princess	Ashman
6		
7		
8	Rani	Gagan

The number of performances between items assigned by each of the remaining composers apart from Ashman was the same.

The sixth performance was assigned by Badal and third performance was assigned by Gagan. Hence, the second and seventh performances were assigned by Dyu. The difference between all the performances assigned by a single composer was 4.

From point (i) Badal and Ashman cannot assign items to Queen and in the second round even Gagan has already assigned to Rani. Hence, Queen was assigned to Dyu and her performance was number seven.

The remaining dancer in the second round is Samragni. Her performance number is sixth.

Since the order of performance is same in both the rounds, therefore, we get the whole following table:

Performance number	Dancer	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

28. Which pair of performances were composed by the same composer?
A. The first and the seventh
B. The third and the seventh
C. The first and the sixth
D. The second and the sixth

Answer ||| C
Solution |||
From the given options, first and sixth performances were composed by the same composer, Badal.
The correct option is C.
From point (iii) and (iv), the first and last performances were by Princess and Rani respectively and their composers were Badal and Gagan respectively.
The sequence of performance is the same in the second round. Hence, the fourth and fifth performances were by Rani and Princess.

From point (v), Ashman was the composer in fourth and fifth performance as all dancers performed with different composers for the first time.

Performance number	Dancer	Composer
1	Princess	Badal
2		
3		
4	Rani	Ashman
5	Princess	Ashman
6		
7		
8	Rani	Gagan

The number of performances between items assigned by each of the remaining composers apart from Ashman was the same.

The sixth performance was assigned by Badal and third performance was assigned by Gagan. Hence, the second and seventh performances were assigned by Dyu. The difference between all the performances assigned by a single composer was 4.

From point (i) Badal and Ashman cannot assign items to Queen and in the second round even Gagan has already assigned to Rani. Hence, Queen was assigned to Dyu and her performance was number seven.

The remaining dancer in the second round is Samragni. Her performance number is sixth.

Since the order of performance is same in both the rounds, therefore, we get the whole following table:

Performance number	Dancer	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

Logical Reasoning||Logical Matching||Logical Matching

29. **Direction:** 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. |||End|||

What is the minimum possible number of different types of prizes?

Answer ||| 2

Solution |||
We are given that there is only one prize of type a, hence, to make the number of types the least, the second box can have a maximum number of prizes, i.e., it can be 99. Therefore, the minimum possible number of different types of prizes is 2.
The correct answer is 2.

30.What is the maximum possible number of different types of prizes?
Answer ||| 6
Solution |||
To make the number of different types of prizes maximum we will take the condition that the next item after 1 should be the least after it is doubled. The order could be 1, 2, 4, 8, 16, 32 containing six types. Sum of these numbers is 63, therefore, we cannot double the number 32 as it would give us 64 and the total sum would exceed 100. Hence, the maximum possible number of different types of prizes is 6.
The correct answer is 6

31.Which of the following is not possible?
A. There are exactly 30 items of type b
B. There are exactly 45 items of type c
C. There are exactly 75 items of type e
D. There are exactly 60 items of type d

Answer ||| B
Solution |||
Let's solve this by checking every option.
In option A, there are exactly 30 items of type b. According to the given condition that the number of items at least double as you move to the next type, this option is possible. We know that the first type contains 1 item and according to this question the second type contains 30 items. Therefore, the third item after fulfilling the doubling condition can contain 100 – 31, i.e., 69 items.
In option B, there are exactly 45 items of type c. According to the given condition that the number of items at least doubles as you move to the next type, this option is not possible.
To satisfy the conditions of the question, either the second number should be 54 (as total is 100) or the fourth number should be at least 90 (double of 45). The second number cannot be 54 as the second number cannot be greater than the third number and the fourth number cannot be 90 as in that case the total number of gifts becomes greater than 100. Hence, there cannot be 45 items of type C.
The correct option is B.

32.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?
A. 5
B. 4
C. 6
D. 3

Answer ||| A
Solution |||
We know that there is no order in which the prizes are placed in the boxes. We can say that the total prizes of the same type which were kept in box 45 were 1+ 31 + 43 = 75. To make the number of different types of prizes maximum we will take the condition that the next item after 1 should be the least after it gets doubled, therefore the items can be in order 1, 2, 4, 8, 75. The sum of these = 90.
Since the total is 100 we cannot double 8 as it would lead to 16 which will exceed the total by 6. Hence, the maximum possible number of different types of items are 5.
The correct option is A.

Slot-1 QA

1. 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
Answer: 20
Solution:
Let, the total number of students be 100S.
So, girls = 60S and boys = 40S
Given, 60S – 40S = 30 or S = 1.5
So, we can form the following table:

	Girls	Boys	Total
Passed	72	30	102
Failed	18	30	48
Total	60S=90	40S=60	100S=150

So, percentage of girls who did not pass = 18/90 x 100 = 20%

2. If $(5.55)^x = (0.555)^y = 1000$, then the value of $\frac{1}{x} - \frac{1}{y}$ is
A. 1
B. $\frac{1}{3}$
C. $\frac{2}{3}$
D. 3
Answer: B
Solution:
$(5.55)^x = (0.555)^y = 1000$
Taking log with respect to the base 10 on each side, we will get,
$$x log(5.55) = y\, log(0.555) = log 1000 = log 10^3 = 3$$
$$x = \frac{3}{log\,(5.55)}, y = \frac{3}{log(0.555)}$$
So, $\frac{1}{x} - \frac{1}{y} = \frac{log(5.55)}{3} - \frac{log\,(0.555)}{3} = \frac{log(5.55) - log(0.555)}{3} = \frac{1}{3} \times log\left(\frac{5.55}{0.555}\right) = \frac{1}{3} log\,(10) = \frac{1}{3}$

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3. 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
Answer: 3920
Solution:
(1,1) to (4,6) means 3 steps to the right and 5 steps up.
These can be done in $\frac{8!}{(3!)(5!)} = 56\,ways$
Similarly, from (4,6) to (8,10) is 4 places right and 4 places up.
No.of ways = $\frac{8!}{(4!)(4!)} = 70$
Total possibilities = 70 x 56 = 3920.

4. 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
Answer: 43
Solution:
Let, F denote the set of all players who can play football.
Similarly, T is for tennis and C is for cricket.
Given, n(F)=144, n(T) 123 and n(C) = 132
N(F & T) = 58
N(F&C)=63
N(T&C)=25
N(F&T&C)=x (let)
As every member can play at least 1 game,
144+123+132 – 58 – 63 – 25 + x= 256
On solving, we will get, x = 3
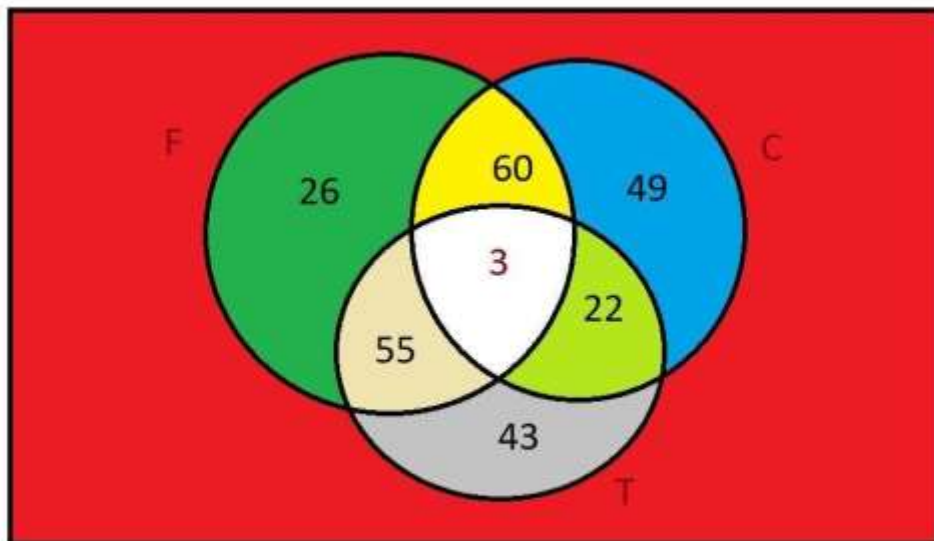
5. In a circle of radius 11 cm, CD is a diameter and AB is a chord of length 20.5 cm. If AB and CD intersect at a point E inside the circle and CE has length 7 cm, then the difference of the lengths of BE and AE, in cm, is

A. 1.5

B. 3.5

C. 0.5

D. 2.5

Answer: C

Solution:

Since radius is 11 cm and CD is a diameter, CD = 22 cm

Since CE = 7 cm, , ED = 15 cm

Let, AE be L cm

So, BE = (20.5 – L) cm

Since chords intersect each other such that the intercepted parts will have the same product, we can write, 7x 15 = L (20.5 – L)

Solving, we will get, L = 10 or 10.5

So, 20.5 – L = 10.5 or 10

So, the required difference is 0.5 cm.

6. 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

A. 75

B. 80

C. 60

D. 70

Answer: D

Solution:

Let us assume that the full marks are 100M.

So, Meena got 40M.

Under review, marks increased by 50% of 40M = 20M

So, increased marks = 60M

So, pass marks = 60M + 35

Post review score increased by 20% of 60M = 12M

So, final marks = 72M

So, passing marks = 72M - 7

So, 60M + 35 = 72M – 7

12M = 42

60M = 210 and M = 3.5

Pass marks = 60M + 35 = 210+35=245

Full marks =100M = 350

Pass percentage = $\frac{245}{350} \times 100\% = 70\%$.

7. 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

A. 5 : 6

B. 3 : 4

C. 2 : 3

D. 4 : 5

Answer: C
Solution:
The side of the hexagon will be one-third of the side of the equilateral triangle.
Let us assume that the side of the hexagon is H.
So, the side of the equilateral triangle = 3H

Area of the hexagon $= \frac{H^2 3\sqrt{3}}{2}$

And that of the equilateral triangle $= \frac{(3H)^2\sqrt{3}}{4} = \frac{H^2 9\sqrt{3}}{4}$

So, the ratio 2:3.

8. 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
Answer: 9
Solution:
The given equation is 3x + 5y – 45 = 0…………….(1)
Equation of the X axis is y = 0………………………….(2)
Equation of the Y axis is x = 0 …………………………..(3)
Solving (1) and (2), we will get, x = 15
Solving (1) and (3), we will get, y = 9
We will get a right-angled triangle with sides 15 units and 9 units.
So, using Pythagoras' Theorem, the length of the hypotenuse = 17.49 units
So, circum radius = 17.49/2 = 8.75 units
So, the nearest integer will be 9

9. 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
Answer: 10
Solution:
We can form the following table:

Ca se	M	m +1	f(m)	f(m+1)	8f(m+1)	8f(m+1)- f(m)	Eqn	Soln	Accept able
1	Ev en	Od d	m(m +1)	m+4	8m+32	7m+32-m²	7m+32- m²=2	10,- 3	None
2	Od d	Ev en	3+m	(m+1)(m+2)	8(m+1)(m+2)	8(m+1)(m +2)-3-m	8(m+1)(m +2)-3- m=2	No inte	

So, 10 is the only possible solution.

10. 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
A. $(1003)^{15} + 6$
B. $(977)^{15} - 3$
C. $(1003)2^{15} - 3$
D. $(977)2^{14} + 3$
Answer: C

Solution:

We can form the following table:

Beginning of	Population
2019	1000
2020	2x1000+3
2021	2x(2x1000+3)+3
2022	2x(2x(2x1000+3)+3)+3
………..	…………
2019+R	2^Rx1000+3$(1+2+2^2+…+2^{R-1})$

Now, we can simplify that as follows:

2^Rx1000+3$(1+2+2^2+…+2^{R-1})$

$=2^R$x1000+3$(2^R – 1)$

$= (1003)x2^R – 3$

For 2034, R = 15

Putting this, we get, C is the correct answer.

11. 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

Answer: 900000

Solution:

Let the deposits be 100A, 200B, and 100B respectively.

So, that 100A+300B = 1500000

Cancelling 100 from both sides, we will get,

A+3B = 15000………………(1)

We can form the following table:

Case	Principal	Time (year)	Rate	Interest
FD	100A	1	6	6A
Dep 1	200B	1	4	8B
Dep 2	100B	1	3	3B
Total	15L	---	----	6A+ 11B

So, 6A+11B = 76000 ………………(2)

From (1), A = 15000 – 3B …………..(3)

Substituting this in (2), we will get

90000 – 18B + 11B = 76000

B = 2000

From (3) , A = 9000

Invested in the FD = 900000= 9 Lakh.

12. 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

A. 50

B. 85

C. 95

D. 58

Answer: A
Solution:
Let, the two numbers be A and B.
So, AB = 616 ……………..(1)
Also, $\frac{A^3-B^3}{(A-B)^3} = \frac{A^2+AB+B^2}{(A-B)^2} = \frac{157}{3}$
OR, Simplifying, we will get,
$A^2+B^2=1268$………….(2)
Now, $(A+B)^2=A^2+2AB+B^2=2500=(50)^2$
So, the sum is 50.

13. 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?
A. 80
B. 85
C. 100
D. 95
Answer: A
Solution:
Let, the cost price of the book be Rs. 100B and that of the pen be Rs. 100P.
So, 95P + 115B = (100P+100B)+7…………..(1)
And 105P + 110B = (100P+100B)+13………(2)
From (1), 15B = 5P + 7 ……………..(3)
From (2), 5P + 10B = 13…………..(4)
Adding (3) and (4), we get,
25B = 20
100B = 80

14. 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
A. 20
B. 10
C. 35
D. 25
Answer: A
Solution:
Let, the speed of the first car be 100V.
So, the speed of the second car = (100+R)V
Let, time taken by the first car be T hours.
So, the time taken by the second car = (T − 1) hours
So, 100VT = (100+R)V(T − 1)
100T= 100T − 100 + RT − R
R(T - 1) =100
R = 100/(T − 1)
Substituting T = 6, R = 20.

15. 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?

A. 18
B. 12
C. 24
D. 36

Answer: A

Solution:

Let, A's usual efficiency be 2a units of work per day.

Also let, B's usual efficiency be b units of work per day.

So, total work = 12(2a+b) units

And 9(a+3b) = 12(2a+b)

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

3a+9b = 8a + 4b

We get, a = b

So, A will take $\frac{12(2a+b)}{2a} = \frac{6(3a)}{a} = 18\ days$

16. If $a_1 + a_2 + a_3 + ... + a_n = 3(2^{n+1} - 2)$, then a_{11} equals

Answer: 6144

Solution:

Sum up to the 10th term = $3(2^{11} – 2)$

And the sum up to the 11th term = $3(2^{12} – 2)$

So, the 11 th term = $3(2^{12} – 2) – 3(2^{11} – 2) = 3(2^{12} – 2 – 2^{11} + 2) = 3(2^{11}) = 6144$

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

A. 0
B. Infinite
C. 1
D. 2

Answer: C

Solution:

$2^x + 2^{-x}$ has the minimum value of 2.

Max value of cos of any angle is 1.

So, the equation is valid only for x = 0

Hence, C is the correct answer.

###TOPIC###Quantitative Aptitude||Trigonometry||Trigonometry###

18. 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

A. 28
B. 29
C. 31
D. 32

Answer: C

Solution:

A = 1.2B=0.8K or 3B = 2K

Kamala's new income = 0.96K=0.48x2k = 0.48x3B = 1.44B

Bimala's new income = 1.1B

So, Kamala's income is more by 0.34B out of 1.1B

So, percentage = 34/1.1= 31 (approx)

19. 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?

Answer: 880

Solution:

Let the length of the racecourse be R.

So, when the first covers R meters, the second covers (R – 11) m, and the third covers (R – 90) m.

In the second case, when the second covers R m, the third covers (R – 80) m.

So, $\frac{R-11}{R-90} = \frac{R}{R-80}$

Solving, we will get,

R= 880 m

20. 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

A. 22

B. 19

C. 21

D. 20

Answer: A

Solution:

Let, for Amal , total time taken be 3T and for Bimal, the total distance be 3D x LCM(10,20,30) = 3D x 60 = 180D

We can form the following table:

Mode	Amal			Bimal		
	Time	Speed	Distance	Time	Speed	Distance
1	T	10	10T	6D	10	60D
2	T	20	20T	3D	20	60D
3	T	30	30T	2D	30	60D
Total	3T		60T	11D		180D

Since the total distance is same in both cases,

60T=180D or T = 3D

So, we can redraw the table as follows:

Mode	Amal			Bimal		
	Time	Speed	Distance	Time	Speed	Distance
1	3D	10	30D	6D	10	60D
2	3D	20	60D	3D	20	60D
3	3D	30	90D	2D	30	60D
Total	9D		180D	11D		180D

So, for Bimal, the time is 2D extra than Amal over 9D.

So, the percentage is 22.22%.

21. Amala, Bina, and Gauri 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?

A. 7000

B. 6000

C. 6350

D. 7250

Answer: D

Solution:

Since the investments are in the ratio 3:4:5, we can assume the investments as 300P, 400P, 500P.

Similarly, we can assume the rates to be 6R, 5R, 4R respectively.

We can form the following table:

Name	Investment	Rate	Time in year	Interest
Amala	300P	6R	1	18PR
Bina	400P	5R	1	20PR
Gauri	500P	4R	1	20PR
Total				58PR

It is given that $20PR - 18PR = 250$ or $PR = 125$

$58PR = 7250$

22. 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

A. -16

B. -24

C. -12

D. -20

Answer: C

Solution:

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

$(\sqrt{2})^{19}\ 3^4\ 2^4\ 3^{2m}\ 2^{3n} = 3^n\ 2^{4m}\ 2\sqrt{2}$

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

$4+2m=n$ …………..(1) and $4+3n+(19/2) = 4m+(3/2)$…………(2)

Putting the value of n in (2), we get,

$4 + 3(4 + 2m) + 19/2 = 4m + 3/2$

$4 + 12 + 6m + 19/2 = 4m + 3/2$

$2m = -24$

$-12 = m$

23. 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

A. 70

B. 85

C. 80

D. 75

Answer: C

Solution:

Half litre of mixture weighs 480gm.

So, one litre of mixture weighs 960 grams.

We can use alligation as follows:
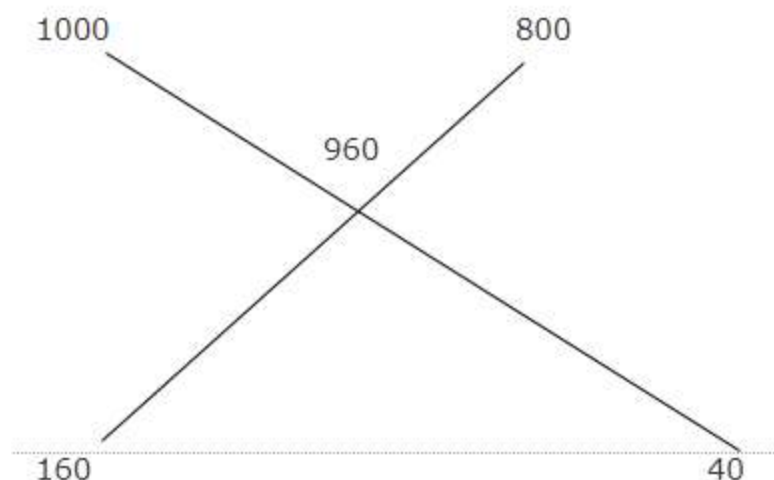
So, the ratio −160:40 = 4:1
So, liquid 1 is 80%.

24. 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

A. 25
B. 150
C. 250
D. 100

Answer: B
Solution:
$\log_5(x + y) + \log_5(x - y) = 3$.................(1)
$\log_2 y - \log_2 x = 1 - \log_2 3$...............(2)

$$\left(\frac{y}{x}\right) = \left(\frac{2}{3}\right)$$
$$3y = 2x = 6k\,(let)$$

Y=2k, x = 3k
Substituting this in (1), we get,

$$5k + k = 3$$

$5k^2 = 5^3 = 125$
K = 5
x = 15, y = 10
xy = 150

25. 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

A. $1 : \sqrt{3}$
B. $2 : \sqrt{5}$
C. $\sqrt{2} : \sqrt{3}$
D. $\sqrt{3} : 2$

Answer: A
Solution:
Let the length, breadth, and height be L, B, and H respectively.
Given, the ratio of the diagonals $= 3 : 2\sqrt{3} : \sqrt{15}$

Squaring, we will get, 9:12:15=3:4:5

We can assume, the squares of the diagonals in the given ratio to be

(L^2+B^2), (B^2+H^2), (H^2+L^2) respectively.

Let us assume that (L^2+B^2), (B^2+H^2), and (H^2+L^2) are equal to 3k, 4k, and 5k respectively.

So, $2(L^2+B^2+H^2) = 12k$

$(L^2+B^2+H^2) = 6k$

$L^2 + B^2 = 3k$

$H^2 = 3k$

Similarly, $L^2=2k$ and $B^2=k$

So, required ratio = B:H= $1:\sqrt{3}$

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

Answer: 5

Solution:

$X^2 =|x|^2=a^2$ (where a = |x|)

So, $a(6a^2+1) = 5a^2$

$6a^3 - 5a^2 + a = 0$

We get, $a (6a^2 - 5a + 1) = 0$

Either a = 0 or $(6a^2 - 5a + 1) = 0$

From $(6a^2 - 5a + 1) = 0$

We get, a = 1 or (-1), this will be ignored as a cannot be negative.

Dividing both sides by |x|, [assuming x to be non-zero]

we will get,

$6x^2 - 5|x| + 1 = 0$

Case 1 = x>0 or $6x^2 - 5x + 1 = 0$ or x = 1/3 or ½

Case 2= x<0 or $6x^2 + 5x + 1 = 0$ or -1/2 or -1/3

So, there are five values, that is, ½, -1/2, 1/3, -1/3, and 0.

27. 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?

Answer: 13

Solution:

Let, 1 man can do m units of work in 1 day and 1 machine can do 1M units of work in 1 day.

So, (3m+8M)T=(3M+8m)(2T)…………………(1)

where T and 2T are the time taken by the two groups mentioned in the question.

Now, 2Mx13 = 26M = total work …………….(2)

From (1), we will get,

3m+8M = 6M+16m

2M = 13m

We can replace 2 machines by 13 men to finish the job in 13 days.

28. The product of the distinct roots of $|x^2 - x - 6| = x + 2$ is

A. -4

B. -16

C. -8

D. -24

Answer: B
Solution:
$|x^2 - x - 6| = x + 2$
$\Rightarrow |(x-3)(x+2)| = x + 2$
$\Rightarrow |x-3| \, |x+2| = x+2$ ....(1)
Case 1:
 x+2>0
$|x-3| = 1$
x = 2 or 4
Case 2:
x+2<0
$|x-3| = (-1)$, impossible
Case 3:
x+2=0
X = (-2)
So, product of the distinct root s= (2)(4)(-2) = (-16)
29. 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 travelled this distance in 45 minutes, then its speed, in km per hour, was
A. 18π
B. 16π
C. 12π
D. 14π
Answer: B
Solution:
For wheel A, the circumference = 60π
For wheel B, the circumference = 80π
Let, B rotated R times.
So, A rotated (R+5000)
So, $60\pi(R + 5000) = 80\pi R$
3R+15000 = 4R
R = 15000
So, B covered 15000x 80π cm distance in 45 minutes or ¾ hours.
So, speed = 4x5000x 80π cm/hour=1600000π cm/hour= 16π kmph.
30. Consider a function f(x+y) = f(x) f(y) where x , y are positive integers, and f(1) = 2. If f (a+1) + f (a+2) + ... + f(a+n) = 16 (2^n - 1) then a is equal to.
Answer: 3
Solution:
f(a+1) = f(a)f(1) = 2f(a)
Also, f(2) = f(1+1) = f(1) f(1) = 2^2
Again, f(3) = f(2+1) = f(2) f(1) = 2^3 and so on
So, f(n) = 2^n
Now, given that
f (a+1) + f (a+2) + ... + f(a+n) = 16 (2^n - 1)
or 2f(a) + 2^2 f(a) + …+ 2^n f(a)= 16(2^n – 1)
$(2+2^2 + … + 2^n$) f(a) = 16 (2^n – 1)
$2(2^n – 1)$ f(a) = $16(2^n – 1)$

$f(a) = 8 = 2^3 = f(3)$
$a = 3$

31. 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
A. 51
B. 53
C. 49
D. 48

Answer: A
Solution:
Gautam scored G (let).
Total score of other 21 students = 21 x 62
So, total of all 22 students = 21 x 62 + G
Since Ramesh scored 82.5,
The 20 students other than both Ramesh and Gautam scored 21x62 − 82.5 = 1219.5 in total
21 students other than Ramesh scored a total of 1219.5 + G
So, the average of those 21 students $= \frac{1219.5 + G}{21}$

So, average of all 22 students $= \frac{1219.5 + G}{21} + 1 = \frac{1240.5 + G}{21}$

So, total of all 22 students $= \frac{1240.5 + G}{21} \times 22 = 21 \times 62 + G$ [found previously]

Solving, we will get, G = 51.

32. If $a_1, a_2, \ldots\ldots$ are in A.P , $\frac{1}{\sqrt{a_1} + \sqrt{a_2}} + \frac{1}{\sqrt{a_2} + \sqrt{a_3}} + \cdots + \frac{1}{\sqrt{a_n} + \sqrt{a_{n+1}}}$

then , is equal to

A. $\frac{n}{\sqrt{a_1} + \sqrt{a_{n+1}}}$

B. $\frac{n-1}{\sqrt{a_1} + \sqrt{a_n}}$

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

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

Answer: A
Solution:

In this AP, let the common difference be d.
So, $a_n = a_1 + (n-1)d$

Now, $\frac{1}{\sqrt{a_n} + \sqrt{a_{n+1}}} = \frac{1}{\sqrt{a_n} + \sqrt{a_{n+1}}} \times \frac{(\sqrt{a_{n+1}} - \sqrt{a_n})}{\sqrt{a_{n+1}} - \sqrt{a_n}} = \frac{\sqrt{a_{n+1}} - \sqrt{a_n}}{d}$

So, the given series will become $\frac{\sqrt{a_2} - \sqrt{a_1}}{d} + \frac{\sqrt{a_3} - \sqrt{a_2}}{d} + \cdots + \frac{\sqrt{a_{n+1}} - \sqrt{a_n}}{d} = \frac{n(\sqrt{a_{n+1}} - \sqrt{a_1})}{nd} = \frac{n(\sqrt{a_{n+1}} - \sqrt{a_1})}{a_{n+1} - a_1}$

Hence, option (A) is the correct answer.

33. Let S be the set of all points (x,y) in the x-y plane such that |x| + |y| ≤ 2 and |x| ≥ 1. Then, the area, in square units, of the region represented by S equals

Answer: 2
Solution:
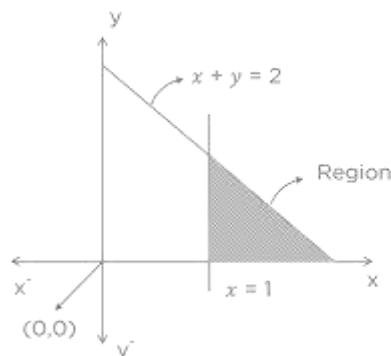
We can see that the shaded region is a right-angled isosceles triangle with equal sides of 1 unit.

So, the area = ½ square units.

Now, this is in the first quadrant.

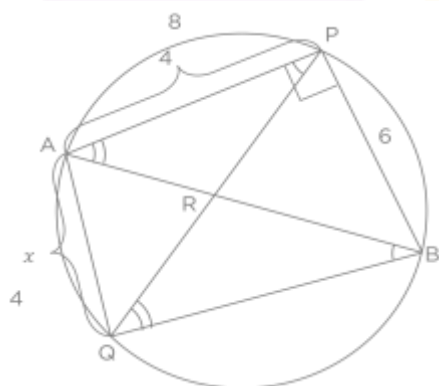So, in the other three quadrants also, we will have such areas.

So, the total area = 4x1/2 = 2 square units.

34. 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

A. 8.5
B. 9.3
C. 9.1
D. 7.8

Answer: C
Solution:

In the diagram, we can see that the angle APB is 90 as the semicircular angle is right angle.

So, in right-angled triangle APB, using Pythagoras' Theorem, AP = 8 cm

Since AQ is half of AP, AQ is 4 cm.

Again, in the right-angled triangle AQB, using Pythagoras' Theorem, QB = root (84) or approximately 9.1 cm.

Hence, option (C) is the correct answer.