CAT 2019

SLOT 1

CAT 2019 Slot 1 VARC

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

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

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

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

For start-ups that promise accessible simplicity, their very structure still might eventually push them toward overwhelming variety. Most of these companies are based on hundreds of millions of dollars of venture capital, the investors of which tend to expect a steep growth rate that can't be achieved by selling one great mattress or one great sneaker. Casper has expanded into bedroom furniture and bed linens. Glossier, after years of marketing itself as no-makeup

makeup that requires little skill to apply, recently launched a full line of glittering color cosmetics. There may be no way to opt out of stuff by buying into the right thing.

1. 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 might transform into what they were exceptions to.
C) They are exceptions to a dominant trend in consumer markets
D) They are facilitating a uniform distribution of commodities in the market

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

A) the empowerment felt by purchasers in buying a commodity were directly proportional to the number of options they could choose from
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) product options increased market competition, bringing down the prices of commodities, which, in turn, increased purchasing power of the poor.

3. 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 $10 and $25.
B) A range of 10 products priced between $5 and $10
C) A range of 25 products priced between $10 and $25
D) A range of 25 products priced between $5 and $10

4. 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) Start-ups with few product options are no exception to the American consumer market that is deeply divided along class lines
B) With the motive of promoting certain rival companies, the government decides to double the tax-rates for these start-ups
C) An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their product catalogue.
D) With Casper and Glossier venturing into new product ranges, their regular customers start losing trust in the companies and their products

5. 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 tend to prefer products by start-ups over those by established companies
C) consumers are susceptible to marketing images that they see on social media
D) having too many product options can be overwhelming for consumers

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

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.

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

A) the average temperature of the feet of penguins in the month of June 2008 were found to be 2.76 degrees Fahrenheit.
B) the penguins' plumage were made of a material that did not allow any heat transfer through convection or radiation.
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 air temperature recorded during the month of June 2008 in the area of study were –10 degrees Fahrenheit.

7. Which of the following can be responsible for Emperor Penguins losing body heat?

A) Plumage
B) Reproduction process
C) Food metabolism
D) Thermal convection

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

A) Keeping a part of their body colder helps penguins keep their bodies warmer
B) Heat loss through radiation happens despite the heat gain through convection
C) Heat gain through radiation happens despite the heat loss through convection
D) Keeping their body colder helps penguins keep their plumage warmer

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

A) 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
B) 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
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 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

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

"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….

10. 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 despite its archaic origins, folk continues to remain a popular tradition
C) that what was once derided as genteel is now considered revolutionary.
D) that what is once regarded as radical in folk, can later be seen as conformist

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

A) Even though it led to folk-rock's golden age, it wasn't entirely free from critique
B) It reinforced Cecil Sharp's observation about folk's constant transformation
C) Freedom and rebellion were popular themes during the second wave of folk revivalism
D) Electrification of music would not have happened without the influence of rock music

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

A) it has been arrogated for various political and cultural purposes
B) of its nostalgic association with a pre-industrial past.
C) folk is a sonic "shabby chic" with an antique veneer
D) the notion of folk has led to several debates and disagreements

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

A) paradoxically, folk forms are both popular and unpopular
B) that British folk forms can be traced to the remote past of the country.
C) the fluidity of folk forms owing to their history of oral mode of transmission.
D) that British folk continues to have traces of pagan influence from the dark ages.

14. 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 plurality and democratising impulse of folk forms emanate from the improvisation that its practitioners bring to it.
B) Folk forms, in their ability to constantly adapt to the changing world, exhibit an unusual poise and homogeneity with each change.
C) The power of folk resides in its contradictory ability to influence and be influenced by the present while remaining rooted in the past.
D) Folk forms, despite their archaic origins, remain intellectually relevant in contemporary times.

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

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.

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

A) The tendency of many cultures to represent their land as "motherland" or "fatherland" may be seen as an expression of their topophilia
B) Scientists have found that most creatures, including humans, are either born with or cultivate a strong sense of topography.
C) The French are not overly patriotic, but they will refuse to use English as far as possible, even when they know it well.
D) Nomadic societies are known to have the least affinity for the lands through which they traverse because they tend to be topophobic.

16. The word "topophobia" in the passage is used:

A) to signify feelings of fear or anxiety towards topophilic people.
B) as a metaphor expressing the failure of the homeland to accommodate non-citizens
C) to represent a feeling of dread towards particular spaces and places
D) to signify the fear of studying the complex discipline of topography.

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

A) The deep anomie of modern urbanisation led to new urbanism's intricate sense of place
B) Philosopher-architects are uniquely suited to develop topophilic design.
C) People's responses to their environment are usually subjective and so cannot be rendered in design
D) Architects have to objectively quantify spaces and hence cannot be topophilic

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

A) sensitive response to race and class problems in upscale residential developments
B) manner in which environments are designed to minimise the social exclusion of their clientele
C) introduction of nationalist projects by such elites to produce a sense of dread or topophobia
D) social exclusivism practised by such residents in order to enforce a sense of racial or class superiority

19. 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) New Urbanism succeeded in those designs where architects collaborated with their clients.
C) The most important, even fundamental, response to our environment is our tactile and olfactory response.
D) Patriotism, usually seen as a positive feeling, is presented by the author as a darker form of topophilia.

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

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."

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

A) Galland acknowledged in the published translations of Arabian Nights that he heard the story of Aladdin from Diyab.
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) Diyab's travelogue described the affluence of the French city of Bordeaux, instead of Versailles

21. 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) Basing it on his own life experiences, Diyab transmitted the story of Aladdin to Galland who included it in Arabian Nights
B) Galland received the story of Aladdin from Diyab who, in turn, found it in an incomplete medieval manuscript.
C) Galland derived the story of Aladdin from Diyab's travelogue in which he recounts his fascination with the wealth of Versailles.
D) The story of Aladdin has its origins in an undiscovered, incomplete manuscript of a medieval Arabic collection of stories

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

A) Diyab's narration of the original story to Galland
B) Diyab's cosmopolitanism and cross-cultural experience
C) Diyab's description of the wealth of Versailles in his travelogue
D) Diyab's humble origins and class struggles, as recounted in his travelogue

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

A) The story of Aladdin is evidence of the eighteenth century French Orientalist attitude
B) The tale of Aladdin documents the history of Europe and Middle East
C) The traveller's experience that inspired the tale of Aladdin resonates even today
D) The archetype of the rags-to-riches story of Aladdin makes it popular even today

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

A) The story-line of many French fairy tales of the 18th century
B) The narrative sensibility of Diyab's travelogue.
C) The depiction of the affluence of Versailles in Diyab's travelogue
D) Galland's acknowledgment of Diyab in his diary

25. DIRECTIONS for the question: 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.

26. DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of 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.

27. DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of 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.

28. DIRECTIONS for the question: Identify the most appropriate summary for the paragraph.

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 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.

D) 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

29. DIRECTIONS for the question: Identify the most appropriate summary for the paragraph.

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

30. DIRECTIONS for the question: Identify the most appropriate summary for the paragraph.

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

B) Engineering and physics fundamentally differ on matters like building a bridge or a nuclear reactor

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

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

31. DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of 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 co-occurrences of behaviors are tracked and then used to make recommendations.

32. DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of 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.

33. DIRECTIONS for the question: 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.

34. DIRECTIONS for the question: 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.

CAT 2019 SLOT 1 DILR

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

1. Which digit does the letter A represent?
2. Which digit does the letter B represent?
3. Which among the digits 3, 4, 6 and 7 cannot be represented by the letter D?
4. Which among the digits 4, 6, 7 and 8 cannot be represented by the letter G?

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

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.

5. Which of the following is true?

A) The third performance was composed by Ashman
B) The second performance was composed by Dyu.
C) The second performance was composed by Gagan

D) The third performance was composed by Dyu

6. Which of the following is FALSE?

A) Queen did not perform in any item composed by Gagan
B) Samragni did not perform in any item composed by Ashman
C) Rani did not perform in any item composed by Badal
D) Princess did not perform in any item composed by Dyu

7. The sixth performance was composed by:

A) Gagan
B) Badal
C) Ashman
D) Dyu

8. Which pair of performances were composed by the same composer?

A) The third and the seventh
B) The first and the seventh
C) The first and the sixth
D) The second and the sixth

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

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.

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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.

9. Which pair of performances were composed by the same composer?

A) The third and the seventh
B) The first and the seventh
C) The first and the sixth
D) The second and the sixth

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.

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

11. What is the maximum possible number of different types of prizes?

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

13. 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.

14. What is the maximum possible number of different types of items?
A) 6
B) 4
C) 3
D) 5

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

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.

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

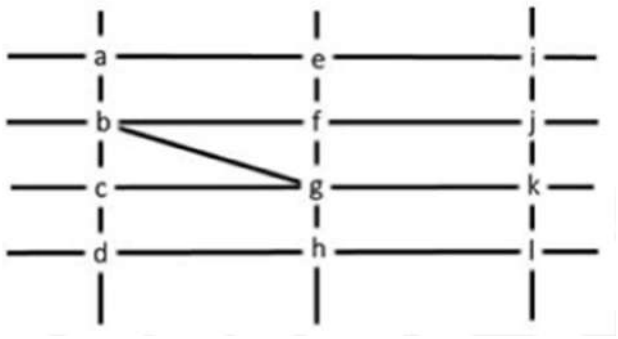
16. Which of the following items is not a type of biscuit?
A) B
B) A
C) L
D) G

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

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

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

The figure below shows the street map for a certain region with the street intersections marked from a through I. 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.

19. Who is standing at intersection a?

A) No one
B) Y
C) V
D) W

20. Who can V see?

A) U, W and Z only
B) Z only
C) U and Z only
D) U only

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

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

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

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

23. What was the highest total score?
A) 25
B) 21
C) 24
D) 23

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

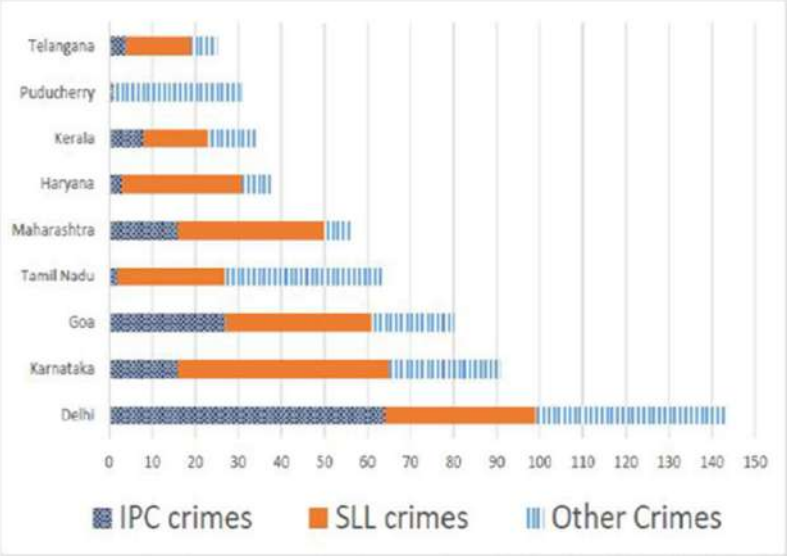
25. Which of the following statements is true?
A) Xyla's score was 23
B) Xyla was the highest scorer
C) Zeneca was the highest scorer
D) Zeneca's score was 23

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

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

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

27. What is the rank of Kerala in the 'IPC crimes' category? (type in numerical value)

28. 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) 19:20

C) 1:9
D) 3:2

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

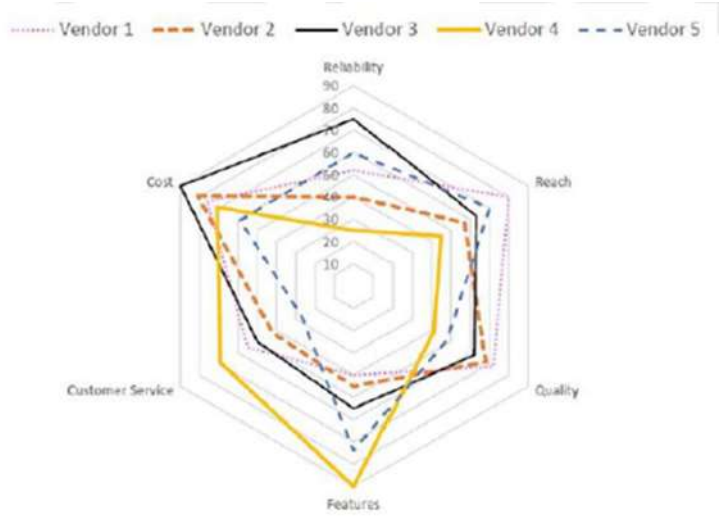
i) Tamil Nadu: 2 ii) Puducherry: 3

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

30. What is the sum of the ranks of Delhi in the three categories of crimes? (type in numerical value)

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

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 Cos



31. On which aspect is the median score of the five vendors the least?

A) Quality
B) Cost
C) Customer Service

D) Reliability

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

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

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

A) Vendor 2 and Vendor 5
B) Vendor 1 and Vendor 5
C) Vendor 1 and Vendor 2
D) Vendor 2, Vendor 3 and Vendor 4

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

A) Vendor 1
B) None of the Vendors
C) Vendor 3
D) Vendor 1 and Vendor 3

CAT 2019 Slot 1 QUANT

1. 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

2. 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?

3. If $(5.55)^x = (0.555)^y = 1000$, then the value of $\frac{1}{x} - \frac{1}{y}$ is

A) ○ 2/3
B) ○ 3
C) ○ 1
D) ○ 1/3

4. 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) 29
B) 28
C) 31
D) 32

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

6. 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 $8 f(m + 1) - f(m) = 2$, then m equals

7. 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

8. If $a_1 + a_2 + a_3 + \ldots\ldots + a_n = 3 \times (2^{n+1} - 2)$, for every $n \geq 1$, then a_{11} equals (type in box)

9. 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) 25
C) 30
D) 10

10. The number of solution to the equation $|x|(6x^2 + 1) = 5x^2$ is (type in box)

11. 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 (type in box)

12. 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. 100
D. 250

13. 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) $\sqrt{3}:2$
C) $\sqrt{2}:\sqrt{3}$
D) $2:\sqrt{5}$

14. 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

A) 45
B) 43
C) 32
D) 38

15. 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) 58
D) 95

16. 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) 2.5
B) 3.5
C) 1.5
D) 0.5

17. 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?

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

A) 7250
B) 7000
C) 6350
D) 6000

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

A) -24
B) -4
C) -8
D) -16

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

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

21. 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) 80
B) 75
C) 85
D) 70

22. 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

23. 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) 3 : 4
B) 2 : 3
C) 5 : 6
D) 4 : 5

24. Let S be the set of all points (x, y) in the x-y plane such that $|x|+|y| \leq 2$ and $|x| \geq 1$. Then, the area, in square units, of the region represented by S equals: (type in box)

25. 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) 48
B) 49
C) 53
D) 51

26.

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

A) ○ $\frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$

B) ○ $\frac{n}{\sqrt{a_1}-\sqrt{a_{n+1}}}$

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

D) ○ $\frac{n}{\sqrt{a_1}+\sqrt{a_{n+1}}}$

27. 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) 24
B) 12
C) 18
D) 36

28. 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) 21
C) 19
D) 20

29. 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) 60
C) 80
D) 70

30. 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) 100
B) 80
C) 85
D) 95

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

A) 16π
B) 14π
C) 18π
D) 12π

32. 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 (type in box)

33.

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

A) ○ -16
B) ○ -24
C) ○ -20
D) ○ -12

34.

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) ○ $(1003)2^{15} - 3$
B) ○ $(997)2^{14} + 3$
C) ○ $(1003)^{15} + 6$
D) ○ $(997)^{15} - 3$

Solutions:

VARC

Sr.No	Correct Answer	Explanation
1	B	For this, we need to concentrate on Paragraphs 2 and 4 of the passage. In paragraph 2, the author says that Casper and Glossier are exceptions to a dominant trend and in Paragraph 4, the author explains how these companies get pushed into offering variety. Options 1 and 4 are easy to reject as they are not mentioned. Out of options 2 and 3, though both are factually correct according to the passage, 2 is more appropriate because the question stem asks for the OVERALL PURPOSE of the mention of these two companies. Hence, the answer should be OPTION 2.
2	B	Let us examine the options one by one. Option 1 - The second line of the passage contradicts this option and hence this option weakens the author's claim. Option 2 - The author relates to this when he/she mentions that a few companies which don't offer many options have sprung up because of choice anxiety. So, it is possible that those companies do better for a period of time than the companies which give options. However, the author explains that even the companies which don't give options will start to offer options in order to survive. But it is entirely possible that for a period of time the annual sales growth of companies with fewer product options are higher than that of companies which curated their products for target consumers Hence, this does not weaken the author's claim. Option 3 - According to the author, lifestyle influencers have a positive impact on consumers and the companies that hire them should have higher sales. This option contradicts that claim and hence weakens. Option 4 - This option contradicts the author's claim mentioned in the last line of the third paragraph and hence weakens. Hence, the answer should be OPTION 2.
3	B	A reading of paragraph 3 helps us get to the answer. The author expresses concern for America's lower classes and how with the options expanding, purchasing even basic things has become difficult for them (Last line of the third paragraph). Option 2 aligns the best with this thought process. Hence, the answer should be OPTION 2.

4	C	The author's prediction is that the start-ups offering few product options will eventually have to move towards variety (Last paragraph first line and the further reading of this paragraph elaborates on this idea). The statement adding least depth is likely to be the one which contradicts this idea or does not support it very strongly. Let us examine the options one by one. Option 1 - If the start-ups with few product options are no exception to the American consumer market, then their fate is likely to be determined by the trend in the market which favours companies offering variety. So this supports the author's idea fairly strongly. Option 2 - If the government decides to double the tax-rates for these start-ups, then surviving and making profits becomes even more difficult for these companies and it lends support to the author's argument that these companies will have to move towards variety to meet the expectations of steep growth rate of the investors which can't be achieved by selling one great product. Option 3 - An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their product catalogue means that they will be able to the investors' expectations without offering variety and this contradicts the author's prediction. A very strong contender for the right answer. Option 4 - This option talks about what happens once the companies have already ventured into new products and the author's prediction is that they will venture into new products. So what happens once the companies start offering variety is irrelevant to the question. Hence, the answer should be OPTION 3.
5	B	Options 1 & 4 can be inferred from the first few lines of the passage where the author talks about choice anxiety, etc. Option 3 can be inferred from the lines at the end of the first paragraph where the author talks about people gravitating towards lifestyle influencers. Option 2 cannot be inferred. Hence, the answer should be OPTION 2.
6	A	Option 1 - The point here is that the temperature of the Penguins' bodies (but not surface plumage) was higher than the surrounding air which allowed for radiation to take place. The average air temperature mentioned in the passage is 0.32 degrees Fahrenheit. Now, it makes no difference to the findings of the study reported if the temperature of the feet of penguins was 1.76 degrees Fahrenheit (as mentioned in the passage) or 2.76 degrees Fahrenheit as in either case it is

		higher than the average air temperature and radiation will take place. This implies that this option does not negate the findings of the study reported and hence should be the answer. Option 2 - The problem with this option is that if the heat transfer could not take place, then the study would have very different findings as much of the explanation in the study is based on heat transfer through radiation and convection. Option 3 - This option would mean that the temperature on the plumage was higher than the average air temperature and then heat would flow from plumage to the outside air. This is in direct contradiction with the findings of the study. Option 4 - If the average air temperature were -10 degrees Fahrenheit, then it would be lower than the temperature on the plumage. Hence, heat would flow from plumage to the outside air which contradicts the report in the study. Hence, the answer should be OPTION 1.
7	B	The other three options result in gaining body heat (explained in the passage). Reproduction, however, is going to result in the loss of body heat. Hence, the answer should be OPTION 2.
8	A	The word 'Paradoxical' is defined as 'self-contradictory'. The author here means that though a part of Penguins' bodies (their plumage) is colder than the outside air, it actually helps keep their bodies warmer (which is kind of self-contradictory). Option 2 - This statement, though true, is not self-contradictory and hence not paradoxical. Options 3 & 4 are factually incorrect according to the passage. Hence, the answer should be OPTION 1.
9	B	In Paragraph 3, the author is talking about how the outside air (which is slightly warmer than the plumage) comes into contact with the plumage and donates minute amounts of heat back to the penguins, then cycles away at a slightly colder temperature. The other options do not relate to the point being discussed in the last line of paragraph 3. Hence, the answer should be OPTION 2.
10	D	From the lines '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 & '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 , it is clear that these examples lines highlight that folk music has been generally considered revolutionary, parochial, etc but at the same ime it is admired and followed also. This is reflected in option 4.
11	D	Electrification of folk music happened later and not the other way round. So this cannot be inferred as there is no concrete evidence for the same. Option 1 can be inferred from last line of the first paragraph. Option 2 can be inferred from third paragraph. Option 3 can be inferred from last paragraph.
12	B	From the lines '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, it is clear that folk music is considered to be associated with past of something nostlagic (the key word is 'fossilised'). This is reflected in option 2. Other options do not reflect the seemingly association of the folk music with the past.
13	A	Option 1 is not referring to folk music being plural and diverse, instead it is showing the perception relted to appeal of this genre. Other option show the causes for plurality and diversity within the British folk tradition.
14	B	From the lines '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, the author is least likely to agree with this genre keeping homogeneity with each change. Hence answer is option 2.
15	A	From the lines '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., it is clear that option 1 is closest to author's understanding of topoohilia. 'Topography' is features and hence option 2 rejected. Option 3 is about language and not land/area, therefore rejected. Option 4 is exactly opposite of what has been asked and hence rejected.
16	C	From the lines '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, it is clear that answer is option 3.
17	C	From the lines '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', it is clear that this experience is very subjective and personal and hence cannot be quantified. This is clearly reflected in option 3.
18	D	From the line '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 this is reflected in option 4.

19	D	From the lines '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 and the lines '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', it is clear that author will not contradict option 4 and hence is the answer option.
20	C	The inversion being referred to is that instead of the idea that the 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, now the new idea was that Diyab might have based it on his own life — the experiences of a Middle Eastern man encountering the French and not vice-versa. We need to show which option "invalidates" this new idea i.e. which option says that the story of Aladdin was not based on Diyab's life. Let us examine all the options one by one. Option 1 - If Galland acknowledged in the published translations of Arabian Nights that he heard the story of Aladdin from Diyab, then it means that the story is based on Diyab's life and hence the inversion does not get invalidated. Hence, this should not be the answer. Option 2 - If the French fairy tales of the eighteenth century did not have rags-to-riches plot lines like that of the tale of Aladdin, then it means that the tale of Aladdin could not have been based on the French fairy tales, meaning it could then have been based on Diyab's life rather. The inversion does not get invalidated. Hence, this should not be the answer. Option 3 - If the description of opulence in Hanna Diyab's and Antoine Galland's narratives bore no resemblance to each other, then Galland was not influenced by Diyab's narrative while writing his own, meaning that the story was not based on Diyab's life. This is exactly what we need to invalidate the inversion. This option is a very strong contender for the correct answer. Option 4 - Change of the name of the city does not matter as the story could still be based on Diyab's own life with a change in the name of the city. The inversion does not get invalidated. Hence, this should not be the answer. Hence, the answer should be OPTION 3.

21	A	According to the author, Galland heard the tale of Aladdin from Diyab (Last line of Paragraph 1). An understanding of the first and the second paragraphs informs us that the author is of the opinion that Galland included the tale told by Diyab in Arabian Nights and it is highly likely that Diyab might have based the tale on his own life experiences. So, this leads to OPTION 1 BEING THE ANSWER. Let us now examine the problems with the other options. Option 2 - Neither Galland nor Diyab found the tale of Aladdin in an incomplete medieval manuscript. So this option is incorrect. Option 3 - Galland did not derive the story from Diyab's travelogue Option 4 - The story of Aladdin does not have its origins in an undiscovered, incomplete manuscript of a medieval Arabic collection of stories. So this option is factually incorrect.
22	A	Towards the end of the passage, the author talks about Diyab's understanding of Paris' culture. He also talks about the Ups and Downs faced by Diyab and his humble beginnings. The author also mentions that Diyab describes the vast wealth of Versailles. These three features also resonate with the character of Aladdin. Hence, Options 2, 3 and 4 will be incorrect. From option 1, we only get to know that Galland gets the story from description of Diyab. We can't conclude from this option that Aladdin is based on Diyab. Hence, the answer should be OPTION 1.
23	C	In the first two lines of the last paragraph, the author says that Aladdin is relevant even today because of its travel experiences. Option 3 talks exactly about the same. Hence, the answer should be OPTION 3.
24	A	In the third paragraph, the author says that many scholars thought the story of Aladdin might have been inspired from French fairy tales. The author tries to disprove this by saying various instances from Diyab's life and how it would have inspired him to base Aladdin upon him. Options 2, 3 and 4 support the author's claims whereas option a goes against the author's claims. Hence, the answer should be OPTION 1.
25	2	After reading all the sentences/context, it is clearly understood that discussion moves round symbols and their interptetation modern context. Also some sort of analogy has also been drawn with historical context. In the rearrangement, the opening sentence has to be 4 , as it

		introduces Robert Proctor and his idea of the symbols. After this 3 will come as it talks further about these symbols by drawing analogy symbols on sheilds of ancient knights. After this 1 will come, as it highlights the embeded meaning of the suffixes. After this 5 will come as it tells about the significance of 'tron' in having control. So the order is 4315. 2 introduces the intellectual and cultural angles to the discussion of these symbols, which is off tangent and hence odd one out.
26	2341	After reading all the sentences, it is understood that context moves round 'mind reading' and hence the opening sentence is 2. After this 3 will come as the key link is 'mid reading' . The examples 'developmental disorders' in 4 have been given in 1. Hence 41 is a mandatory pair. The final rearrangment of the sentences will be 2341
27	3241	After reading all the sentences, it is understood that context starts from very specific case and then conclusion is drawn. The context moves round the meaning and interptetation of phrase 'carpe diem' in different languages and its profound impact on our understanding of the world around us. The introductory sentence will be 3 and the hint for it is 'often' i.e. generally the meaning of the phrase is 'seize the day'. After this 2 will come as it highlights the meaning of the same phrase in Latin Language. 4 is the summing up sentences 2 & 3. Both the interptetations (of the phrase) are same but have subtle difference as in the way we value the world around us. Hence the final seqiuence is 3241.
28	B	The keywords are 'hidden persuaders' , hidden consumer motivations' , 'supraliminal level' & consumers are not even aware of their thought being manipulated by advertising companies. Option 1 and option 4 is rejected as Vance did not mention 'subliminal' level and this option says that people are aware of these manipulations. Option 3 is rejected as 'people are not aware' of these manipulations. Hence the passage is aptly summarised by option 2.
29	B	The key points are 'absent things, known as displaced reference', 'absence of any obvious stimuli' & 'Thought precedes meaningful referential communication. All these points have aptly captured by option 2. Option 1 is rejected as it is not about 'all speech' , instead it is about 'meaningful communication. Nowhere it is mentioned that 'only humans' have this capacity, so option 3 is rejected. Option 4 is rejected as it is nowhere mentioned that 'displaced reference' is particular to humans.

30	A	The context is comparison between pure science and engineering. The key lines are 'without regard to whether it will afford any practical benefit', 'correlative applied science in which physical theories are put to some specific use,'ut an engineer's knowledge of the world is not the same as the physicist's knowledge' , & sometimes the true theories apply only under highly idealized conditions which can only be created under controlled experimental situations'. All these key points aptly summarized by option 1.
31	4123	After reading all the sentence it is easy to figure out that opening sentence is 4, as it introduces the term 'Collaborative filtering'. After this 1 will come as it is an example of 'Collaborative filtering'. After this 2 will come as 'these algorithms' referes to 'results' shown is 1. The 'problem ' in 2 is exeeplified in 3. Hence 4123
32	3241	The context moves round 'learning how to handle online criticism' and if it does not happen 'what this lead to'. The opening sentence is 3. After this 2 will come as it tells one of the mature ways to accept/ handle criticism. 1 will happen if 4 does not come into the picture. Hence the final sequece of the sentences 3241
33	2	The context moves around the rights of hearing impaired or some pre-concieved notions about hearing impaired. The opener in this case is 5. After this 3 will come as it shows the result of 5. 'this prejudice' refers to the 'denied rights' in 3. 1 tell further about Pedro Ponce de León'. So the order of these four of five sentences is '5341'. Hence the odd one out is 2 as it talks a little off tangent about the same i.e 'deaf are incapable of speech'.
34	1	After reading all the sentences it can be deduced that context is about 'Identity is one of the most important features of organizations' and its differing views. Afere this 3 will come as it further tells types of identites'. 5 & 2 form a mandatory pair. So the order of the sentences is 4352. 1 is odd one as it takes the discussion to altogether diffetrent tangent.

DILR

1. Correct Answer – 1

Starting with F, F+F gives us F. only possible F can be 0 here.

	B	H	A	A	G	0
	A	H	J	0	K	0
A	A	0	G	C	A	0

In column 5, A+0 gives us C. This is only possible if 1 is carried forward from column 5. This have 2 interpretations, 1) G+K is more than 10, 2) C is one more than A.

Using 2nd and changing C's into A+1.

In column 3, H+H is equal 0. This can be done if H is 5 or 0. As F is 0, H can be 5 only.

In column 2, B+A is also A. This is possible if B is 0 but F is already 0. Further B can also be 9 for which 1 can be carried forward from column 3.

	9	5	A	A	G	0
	A	5	J	0	K	0
A	A	0	G	A+1	A	0

As only 1 can be carried forward, A can only be 1.

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

In column 6, G+K ends up with 1, so G and K can be 6+5 or 7+4 or 8+3 or 9+2. But as 9 and 5 are already done, G and K can be 7/4 or 8/3 only.

In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.

2. Correct Answer – 9

Starting with F, F+F gives us F. only possible F can be 0 here.

	B	H	A	A	G	0
	A	H	J	0	K	0
A	A	0	G	C	A	0

In column 5, A+0 gives us C. This is only possible if 1 is carried forward from column 5. This have 2 interpretations, 1) G+K is more than 10, 2) C is one more than A.

Using 2nd and changing C's into A+1.

In column 3, H+H is equal 0. This can be done if H is 5 or 0. As F is 0, H can be 5 only.

In column 2, B+A is also A. This is possible if B is 0 but F is already 0. Further B can also be 9 for which 1 can be carried forward from column 3.

	9	5	A	A	G	0
	A	5	J	0	K	0
A	A	0	G	A+1	A	0

As only 1 can be carried forward, A can only be 1.

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

In column 6, G+K ends up with 1, so G and K can be 6+5 or 7+4 or 8+3 or 9+2. But as 9 and 5 are already done, G and K can be 7/4 or 8/3 only.

In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.

3.

Correct Answer – 7

Starting with F, F+F gives us F. only possible F can be 0 here.

	B	H	A	A	G	0
	A	H	J	0	K	0
A	A	0	G	C	A	0

In column 5, A+0 gives us C. This is only possible if 1 is carried forward from column 5. This have 2 interpretations, 1) G+K is more than 10, 2) C is one more than A.
Using 2nd and changing C's into A+1.
In column 3, H+H is equal 0. This can be done if H is 5 or 0. As F is 0, H can be 5 only.
In column 2, B+A is also A. This is possible if B is 0 but F is already 0. Further B can also be 9 for which 1 can be carried forward from column 3.

	9	5	A	A	G	0
	A	5	J	0	K	0
A	A	0	G	A+1	A	0

As only 1 can be carried forward, A can only be 1.

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

In column 6, G+K ends up with 1, so G and K can be 6+5 or 7+4 or 8+3 or 9+2. But as 9 and 5 are already done, G and K can be 7/4 or 8/3 only.
In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.

4. Correct Answer – 6

Starting with F, F+F gives us F. only possible F can be 0 here.

	B	H	A	A	G	0
	A	H	J	0	K	0
A	A	0	G	C	A	0

In column 5, A+0 gives us C. This is only possible if 1 is carried forward from column 5. This have 2 interpretations, 1) G+K is more than 10, 2) C is one more than A.
Using 2nd and changing C's into A+1.
In column 3, H+H is equal 0. This can be done if H is 5 or 0. As F is 0, H can be 5 only.
In column 2, B+A is also A. This is possible if B is 0 but F is already 0. Further B can also be 9 for which 1 can be carried forward from column 3.

	9	5	A	A	G	0
	A	5	J	0	K	0
A	A	0	G	A+1	A	0

As only 1 can be carried forward, A can only be 1.

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

In column 6, G+K ends up with 1, so G and K can be 6+5 or 7+4 or 8+3 or 9+2. But as 9 and 5 are already done, G and K can be 7/4 or 8/3 only.
In column 4, 1+J is equal to G without any carried forward. Hence, J = G-1. Remaining values for D,E,G,J,K are 3,4,6,7,8. As J=G-1, G can be 4, 7 or 8. Hence, K can be 7, 4 or 3. J can be 3, 6 or 7.

5. Correct Answer – B

We will make a table with composers on the vertical axis and dancers on the horizontal axis.
Keep in mind that - Composers can assign 1st, 2nd, 3rd and 4th position in first round and remaining 5th to 8th position in second round.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal					
	Gagan					
	Dyu					

From condition 3, the first performer was by Princess and this item was assigned by Badal. So we assign 1 in that position.
Similarly from condition 4, The last performance was by Rani; this item was assigned by Gagan. So we assign 8 in that position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1				
	Gagan			8		
	Dyu					

From condition 1, Composer who assigned to Princess did not assigned any item to Queen.
Similarly, from condition 2, Composer who assigned to Rani did not assigned any item to Samragni.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					

It is given in question that the dancers performed their second items in the same sequence of their performance of their first items. This means that if someone performed at 1st position, he would again perform at 5th Similarly, someone who performs at 3rd position would perform at 7th position. Thus princess has performed at 1st position so she would again perform at 5th. Similarly, Rani has performed at 8th position, so she would perform at 4th position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

From condition 5, we get that items assigned by Ashman were performed consecutively. This means that his items were 4 & 5. (when each composer has given the dance item to dancers one then only the composers would be able to give their second list of dances.) (Consecutive items assigned can only be 4 and 5th position)

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5		4		4th& 5th position
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

Let us see what different options are available to different composers. E.g. Badal has given 1st performance to princess, so he can assign 5,6,7,8 position in second round. Now 5th and 8th position are already taken by other composers, thus he is left with assigning 6th and 7th position

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*		6^{th} or 7^{th} position
	Gagan	*		8	*	2^{nd} or 3^{rd} position
	Dyu	*		*		2^{nd} or 3^{rd} position
Extra Notes (if any)						

From condition 5, we also get that the number of performances between items assigned by each of the remaining composers was the same.
Badal can assign 6^{th} or 7^{th} position. Check which one is true.
If Badal assign 6^{th} position, then as per condition 5, difference between both 1^{st} and 6^{th} position is 5 and that should be difference with rest all composers except Ashman. We will see if that is possible ofr other composers. Dyu will be left with 2^{nd} and 7^{th} position and difference is 5. Gagan is left will 3^{rd}postion. Difference 3^{rd} and 8^{th} is also 5. Thus case is true

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*	6	
	Gagan	*	3	8	*	
	Dyu	*	7	*	2	
Extra Notes (if any)						

This is the final order as assigned by different composers

The second performance was composed by Dyu

6. Correct Answer - A

We will make a table with composers on the vertical axis and dancers on the horizontal axis.
Keep in mind that - Composers can assign 1^{st}, 2^{nd}, 3^{rd} and 4^{th} position in first round and remaining 5^{th} to 8^{th} position in second round.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal					
	Gagan					
	Dyu					

From condition 3, the first performer was by Princess and this item was assigned by Badal. So we assign 1 in that position.
Similarly from condition 4, The last performance was by Rani; this item was assigned by Gagan. So we assign 8 in that position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1				
	Gagan			8		
	Dyu					

From condition 1, Composer who assigned to Princess did not assigned any item to Queen.
Similarly, from condition 2, Composer who assigned to Rani did not assigned any item to Samragni.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					

It is given in question that the dancers performed their second items in the same sequence of their performance of their first items. This means that if someone performed at 1st position, he would again perform at 5th Similarly, someone who performs at 3rd position would perform at 7th position. Thus princess has performed at 1st position so she would again perform at 5th. Similarly, Rani has performed at 8th position, so she would perform at 4th position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

From condition 5, we get that items assigned by Ashman were performed consecutively. This means that his items were 4 & 5. (when each composer has given the dance item to dancers one then only the composers would be able to give their second list of dances.) (Consecutive items assigned can only be 4 and 5th position)

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5		4		4th& 5th position
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

Let us see what different options are available to different composers. E.q. Badal has given 1st performance to princess, so he can assign 5,6,7,8 position in second round. Now 5th and 8th position are already taken by other composers, thus he is left with assigning 6th and 7th position

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*		6th or 7th position
	Gagan	*		8	*	2nd or 3rd position
	Dyu	*		*		2nd or 3rd position
Extra Notes (if any)						

From condition 5, we also get that the number of performances between items assigned by each of the remaining composers was the same. Badal can assign 6th or 7th position. Check which one is true.
If Badal assign 6th position, then as per condition 5, difference between both 1st and 6th position is 5 and that should be difference with rest all composers except Ashman. We will see if that is possible ofr other composers. Dyu will be left with 2nd and 7th position and difference is 5. Gagan is left will 3rdpostion. Difference 3rd and 8th is also 5. Thus case is true

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*	6	
	Gagan	*	3	8	*	
	Dyu	*	7	*	2	
Extra Notes (if any)						

This is the final order as assigned by different composers

Queen did not perform in any item composed by Green

7. Correct Answer - B

We will make a table with composers on the vertical axis and dancers on the horizontal axis.
Keep in mind that - Composers can assign 1st, 2nd, 3rd and 4th position in first round and remaining 5th to 8th position in second round.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal					
	Gagan					
	Dyu					

From condition 3, the first performer was by Princess and this item was assigned by Badal. So we assign 1 in that position.
Similarly from condition 4, The last performance was by Rani; this item was assigned by Gagan. So we assign 8 in that position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1				
	Gagan			8		
	Dyu					

From condition 1, Composer who assigned to Princess did not assigned any item to Queen.
Similarly, from condition 2, Composer who assigned to Rani did not assigned any item to Samragni.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					

It is given in question that the dancers performed their second items in the same sequence of their performance of their first items. This means that if someone performed at 1st position, he would again perform at 5th Similarly, someone who performs at 3rd position would perform at 7th position. Thus princess has performed at 1st position so she would again perform at 5th. Similarly, Rani has performed at 8th position, so she would perform at 4th position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

From condition 5, we get that items assigned by Ashman were performed consecutively. This means that his items were 4 & 5. (when each composer has given the dance item to dancers one then only the composers would be able to give their second list of dances.) (Consecutive items assigned can only be 4 and 5th position)

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5		4		4th& 5th position
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

Let us see what different options are available to different composers. E.g. Badal has given 1st performance to princess, so he can assign 5,6,7,8 position in second round. Now 5th and 8th position are already taken by other composers, thus he is left with assigning 6th and 7th position

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*		6^{th} or 7^{th} position
	Gagan	*		8	*	2^{nd} or 3^{rd} position
	Dyu	*		*		2^{nd} or 3^{rd} position
Extra Notes (if any)						

From condition 5, we also get that the number of performances between items assigned by each of the remaining composers was the same.
Badal can assign 6^{th} or 7^{th} position. Check which one is true.
If Badal assign 6^{th} position, then as per condition 5, difference between both 1^{st} and 6^{th} position is 5 and that should be difference with rest all composers except Ashman. We will see if that is possible ofr other composers. Dyu will be left with 2^{nd} and 7^{th} position and difference is 5. Gagan is left will 3^{rd}postion. Difference 3^{rd} and 8^{th} is also 5. Thus case is true

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*	6	
	Gagan	*	3	8	*	
	Dyu	*	7	*	2	
Extra Notes (if any)						

This is the final order as assigned by different composers

Badal

8. Correct Answer – C

We will make a table with composers on the vertical axis and dancers on the horizontal axis.
Keep in mind that - Composers can assign 1^{st}, 2^{nd}, 3^{rd} and 4^{th} position in first round and remaining 5^{th} to 8^{th} position in second round.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal					
	Gagan					
	Dyu					

From condition 3, the first performer was by Princess and this item was assigned by Badal. So we assign 1 in that position.
Similarly from condition 4, The last performance was by Rani; this item was assigned by Gagan. So we assign 8 in that position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1				
	Gagan			8		
	Dyu					

From condition 1, Composer who assigned to Princess did not assigned any item to Queen.
Similarly, from condition 2, Composer who assigned to Rani did not assigned any item to Samragni.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					

It is given in question that the dancers performed their second items in the same sequence of their performance of their first items. This means that if someone performed at 1st position, he would again perform at 5th Similarly, someone who performs at 3rd position would perform at 7th position. Thus princess has performed at 1st position so she would again perform at 5th. Similarly, Rani has performed at 8th position, so she would perform at 4th position.

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman					
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

From condition 5, we get that items assigned by Ashman were performed consecutively. This means that his items were 4 & 5. (when each composer has given the dance item to dancers one then only the composers would be able to give their second list of dances.) (Consecutive items assigned can only be 4 and 5th position)

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5		4		4th& 5th position
	Badal	1	*			
	Gagan			8	*	
	Dyu					
Extra Notes (if any)		5th position		4th position		

Let us see what different options are available to different composers. E.q. Badal has given 1st performance to princess, so he can assign 5,6,7,8 position in second round. Now 5th and 8th position are already taken by other composers, thus he is left with assigning 6th and 7th position

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*		6th or 7th position
	Gagan	*		8	*	2nd or 3rd position
	Dyu	*		*		2nd or 3rd position
Extra Notes (if any)						

From condition 5, we also get that the number of performances between items assigned by each of the remaining composers was the same. Badal can assign 6th or 7th position. Check which one is true.
If Badal assign 6th position, then as per condition 5, difference between both 1st and 6th position is 5 and that should be difference with rest all composers except Ashman. We will see if that is possible ofr other composers. Dyu will be left with 2nd and 7th position and difference is 5. Gagan is left will 3rdpostion. Difference 3rd and 8th is also 5. Thus case is true

		Dancers				Extra Notes (if any)
		Princess	Queen	Rani	Samragni	
Composers	Ashman	5	*	4	*	
	Badal	1	*	*	6	
	Gagan	*	3	8	*	
	Dyu	*	7	*	2	
Extra Notes (if any)						

This is the final order as assigned by different composers

The first and the six

9. Correct Answer – 2

The number of items atleast doubles and there are total 100 boxes each containing an item. So minimum types can be 2 as 1st prize having 1 item of type A and 2nd having 99 items of type B.

10. Correct Answer – 6

Similarly to last one, 1 item of type A then 2 of type B then 4 of type C then 8 of type D then 16 of type E then 32 of type F will sum upto 63 items. There cannot be type G because that will cross 100 item barrier. Hence 6.

11. Correct Answer – C

There is 1 item of type A.

If there are exactly 30 items of type B then there will be 60 or more type C. If 69 type C, then This is possible.

If there are exactly 45 type C then there must be 2 to 22 type B only summing upto 48 to 68 items. Now Type D must have at least 90 (double of 45) items but it is not possible.

Exactly 60 type D is possible if there is 1 type A, 9 type B and 30 type C.

75 of type E is also possible.

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.

12. Correct Answer – D

Now as per the additional information given in the question, there are a total of 75 boxes in which the same item is given (one in box number 45 and 31 items in 1 - 44 boxes and 43 items in 46 - 100 boxes). Now the remaining 25 items has to be maximized in terms of variety. There is 1 item of type A, so let there be 2 items of type B, 4 items of type C, 8 items of type D. Now after that if try to have 32 items of type E, the total items become more than 100. Thus there can be only 4 more types of items other than the one, which has been used in box number 45. So the total different types of items at the most can be 5.

13. Correct Answer – D

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

We have to arrange 3 types of item (B, C and S) (total 12 items) in 16 shelves space. We can have 1 or 2 empty selves (E) between 2 items.
It is known that K is on 16th shelves so we put that on 16th (from condition 4)
(From condition 4) It is given that D, E, F will be placed after biscuits and cookies so they will be in last item group. So we will put D, E, F in last shelves in same order and K will be last in that group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
												D	E	F	K
												D	E	F	K

(from condition 6) there should be 2 empty shelve before C. We also know that C is candy and there are 3 candies
We can arrange them in 2 different ways.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty				empty						empty	D	E	F	K
empty						empty	empty	C			empty	D	E	F	K

(from condition 7) There should be 1 empty shelve before L

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C			empty	L					empty	D	E	F	K
empty	L					empty	empty	C			empty	D	E	F	K

Now (from condition 2), I and J will be placed after A and B. (A….B….I/J….)
(From condition 5) L and J are items of the same type
Mixing above both conditions, we get that I, J, L are of same type and they must be biscuits as they cannot be candies (C is already a candy and they can be only 3 candies in total).
(From Condition 5) H is an item of a different type than L, J. Thus H will be in cookies group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/_)	(_/H)	empty	L					empty	D	E	F	K
empty	L					empty	empty	C	(H/_)	(_/H)	empty	D	E	F	K

(From condition 1) A and B are consecutive thus they lie in same group. They cannot be cookies are there is only 1 space left thus it will be in biscuit.
(Biscuit will be A, B, I, J, L) and then G will be a cookies.
We know that AB are consecutive and I and J after them

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/G)	(G/H)	empty	L	A	B	(I/J)	(J/I)	empty	D	E	F	K
empty	L	A	B	(I/J)	(J/I)	empty	empty	C	(H/G)	(G/H)	empty	D	E	F	K

14. Correct Answer- D

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

We have to arrange 3 types of item (B, C and S) (total 12 items) in 16 shelves space. We can have 1 or 2 empty selves (E) between 2 items.
It is known that K is on 16th shelves so we put that on 16th (from condition 4)
(From condition 4) It is given that D, E, F will be placed after biscuits and cookies so they will be in last item group. So we will put D, E, F in last shelves in same order and K will be last in that group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
												D	E	F	K
												D	E	F	K

(from condition 6) there should be 2 empty shelve before C. We also know that C is candy and there are 3 candies
We can arrange them in 2 different ways.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty				empty						empty	D	E	F	K
empty						empty	empty	C			empty	D	E	F	K

(from condition 7) There should be 1 empty shelve before L

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C			empty	L					empty	D	E	F	K
empty	L					empty	empty	C			empty	D	E	F	K

Now (from condition 2), I and J will be placed after A and B. (A….B….I/J….)
(From condition 5) L and J are items of the same type
Mixing above both conditions, we get that I, J, L are of same type and they must be biscuits as they cannot be candies (C is already a candy and they can be only 3 candies in total).
(From Condition 5) H is an item of a different type than L, J. Thus H will be in cookies group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/_)	(_/H)	empty	L					empty	D	E	F	K
empty	L					empty	empty	C	(H/_)	(_/H)	empty	D	E	F	K

(From condition 1) A and B are consecutive thus they lie in same group. They cannot be cookies are there is only 1 space left thus it will be in biscuit.
(Biscuit will be A, B, I, J, L) and then G will be a cookies.
We know that AB are consecutive and I and J after them

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/G)	(G/H)	empty	L	A	B	(I/J)	(J/I)	empty	D	E	F	K
empty	L	A	B	(I/J)	(J/I)	empty	empty	C	(H/G)	(G/H)	empty	D	E	F	K

G is not a type of biscuit (As we can clearly see that it is cookies in both cases)

15. Correct Answer- C

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

We have to arrange 3 types of item (B, C and S) (total 12 items) in 16 shelves space. We can have 1 or 2 empty selves (E) between 2 items.
It is known that K is on 16th shelves so we put that on 16th (from condition 4)
(From condition 4) It is given that D, E, F will be placed after biscuits and cookies so they will be in last item group. So we will put D, E, F in last shelves in same order and K will be last in that group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
												D	E	F	K
												D	E	F	K

(from condition 6) there should be 2 empty shelve before C. We also know that C is candy and there are 3 candies
We can arrange them in 2 different ways.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty				empty						empty	D	E	F	K
empty						empty	empty	C			empty	D	E	F	K

(from condition 7) There should be 1 empty shelve before L

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C			empty	L					empty	D	E	F	K
empty	L					empty	empty	C			empty	D	E	F	K

Now (from condition 2), I and J will be placed after A and B. (A….B….I/J….)
(From condition 5) L and J are items of the same type
Mixing above both conditions, we get that I, J, L are of same type and they must be biscuits as they cannot be candies (C is already a candy and they can be only 3 candies in total).
(From Condition 5) H is an item of a different type than L, J. Thus H will be in cookies group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/_)	(_/H)	empty	L					empty	D	E	F	K
empty	L					empty	empty	C	(H/_)	(_/H)	empty	D	E	F	K

(From condition 1) A and B are consecutive thus they lie in same group. They cannot be cookies are there is only 1 space left thus it will be in biscuit. (Biscuit will be A, B, I, J, L) and then G will be a cookies.
We know that AB are consecutive and I and J after them

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/G)	(G/H)	empty	L	A	B	(I/J)	(J/I)	empty	D	E	F	K
empty	L	A	B	(I/J)	(J/I)	empty	empty	C	(H/G)	(G/H)	empty	D	E	F	K

1, 2, 6, 12

16. Correct Answer – A

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

We have to arrange 3 types of item (B, C and S) (total 12 items) in 16 shelves space. We can have 1 or 2 empty selves (E) between 2 items.
It is known that K is on 16th shelves so we put that on 16th (from condition 4)
(From condition 4) It is given that D, E, F will be placed after biscuits and cookies so they will be in last item group. So we will put D, E, F in last shelves in same order and K will be last in that group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
												D	E	F	K
												D	E	F	K

(from condition 6) there should be 2 empty shelve before C. We also know that C is candy and there are 3 candies
We can arrange them in 2 different ways.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty				empty						empty	D	E	F	K
empty						empty	empty	C			empty	D	E	F	K

(from condition 7) There should be 1 empty shelve before L

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C			empty	L					empty	D	E	F	K
empty	L					empty	empty	C			empty	D	E	F	K

Now (from condition 2), I and J will be placed after A and B. (A….B….I/J….)
(From condition 5) L and J are items of the same type
Mixing above both conditions, we get that I, J, L are of same type and they must be biscuits as they cannot be candies (C is already a candy and they can be only 3 candies in total).
(From Condition 5) H is an item of a different type than L, J. Thus H will be in cookies group.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/_)	(_/H)	empty	L					empty	D	E	F	K
empty	L					empty	empty	C	(H/_)	(_/H)	empty	D	E	F	K

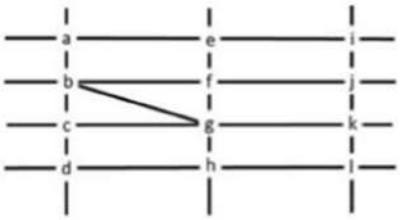
(From condition 1) A and B are consecutive thus they lie in same group. They cannot be cookies are there is only 1 space left thus it will be in biscuit.
(Biscuit will be A, B, I, J, L) and then G will be a cookies.
We know that AB are consecutive and I and J after them

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
empty	empty	C	(H/G)	(G/H)	empty	L	A	B	(I/J)	(J/I)	empty	D	E	F	K
empty	L	A	B	(I/J)	(J/I)	empty	empty	C	(H/G)	(G/H)	empty	D	E	F	K

There are at least four shelves between items B and C

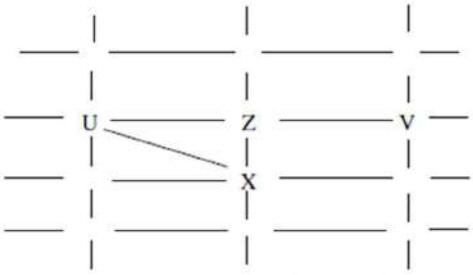
17. Correct Answer- A

Point 1, Only 2 triangles are possible, BCG and BFG. X, U and Z are standing at these points.
Point 2, there is no one else in straight line of X.
Point 3, Y is on the straight line of U and W.
Point 4, Z and V are standing next to each other while U is also in the same row.
Point 5, W is in different row/column then of V and Z.
Point 6, d is empty.



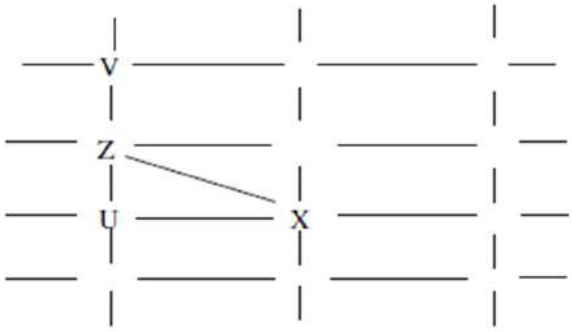
Following are the possible cases:

Case 1:



W cannot see V or Z. So W can only be at the intersection a. Since Y can see only U and W, Y can only be at c where X can see him. Hence this case is rejected.

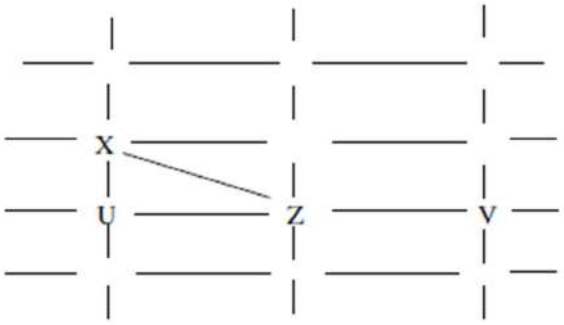
Case 2:



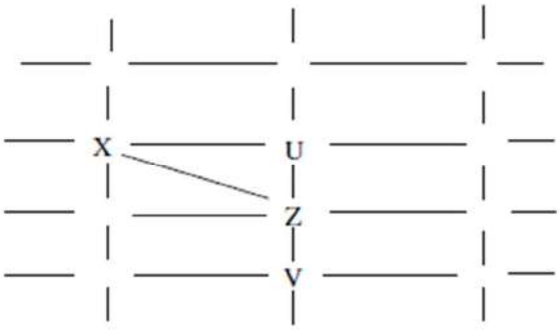
Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

Case 3:

Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.



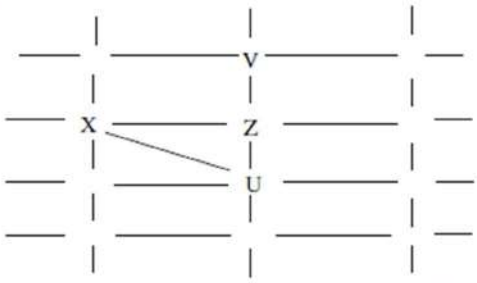
Case 4:



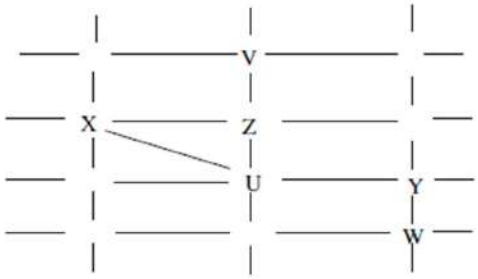
Here W cannot see V or Z and X cannot see W so W can only be placed at i. Y can see only U and W. Y can only be placed at j or e, where he can see more people than U and W. Hence this case is also rejected.

Here W cannot see V or Z and X cannot see W so W can only be placed at i. Y can see only U and W. Y can only be placed at j or e, where he can see more people than U and W. Hence this case is also rejected.

Case 5:



W cannot see V or Z. Y can only see U and W. Hence W and Y can only be placed as shown:

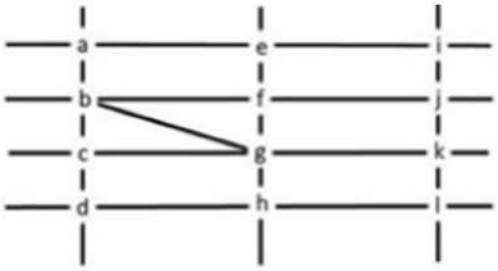


The above mentioned case is the only case possible.

No one is standing at a.

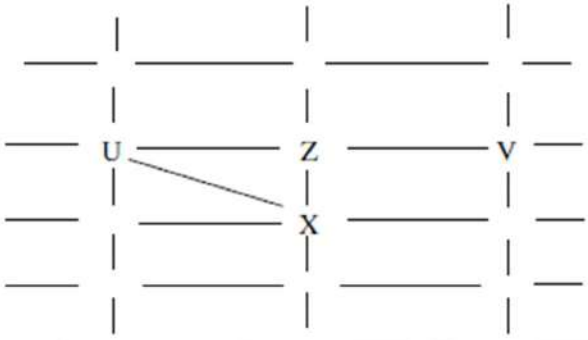
18. Correct Answer – C

Point 1, Only 2 triangles are possible, BCG and BFG. X, U and Z are standing at these points.
Point 2, there is no one else in straight line of X.
Point 3, Y is on the straight line of U and W.
Point 4, Z and V are standing next to each other while U is also in the same row.
Point 5, W is in different row/column then of V and Z.
Point 6, d is empty.



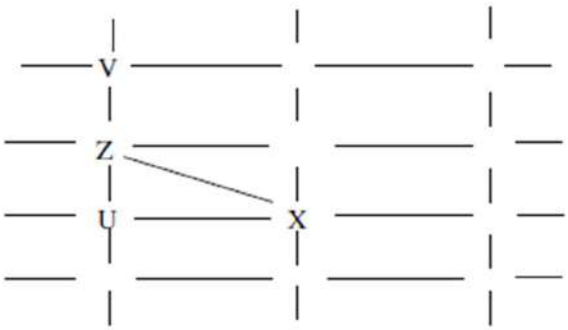
Following are the possible cases:

Case 1:



W cannot see V or Z. So W can only be at the intersection a. Since Y can see only U and W, Y can only be at c where X can see him. Hence this case is rejected.

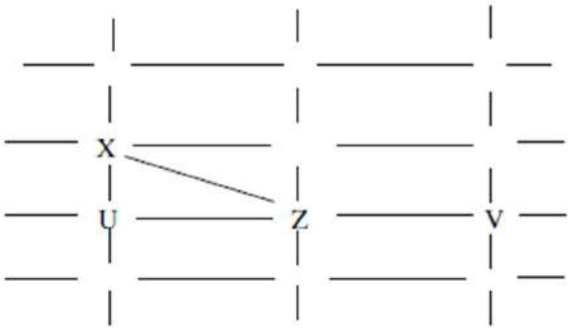
Case 2:



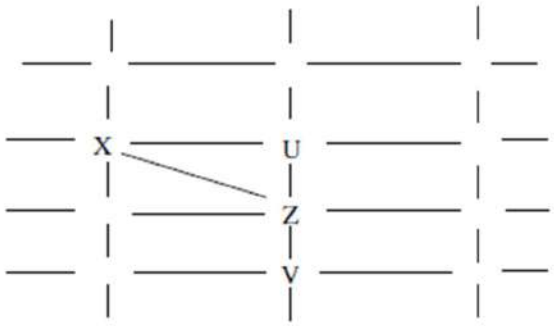
Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

Case 3:

Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

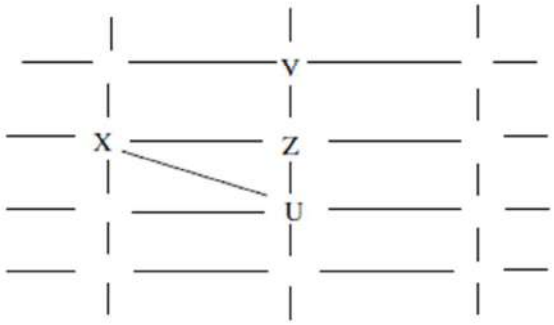


Case 4:

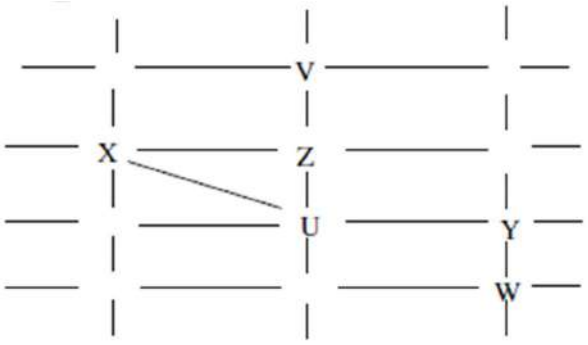


Here W cannot see V or Z and X cannot see W so W can only be placed at i. Y can see only U and W. Y can only be placed at j or e, where he can see more people than U and W. Hence this case is also rejected.

Case 5:



W cannot see V or Z. Y can only see U and W. Hence W and Y can only be placed as shown:

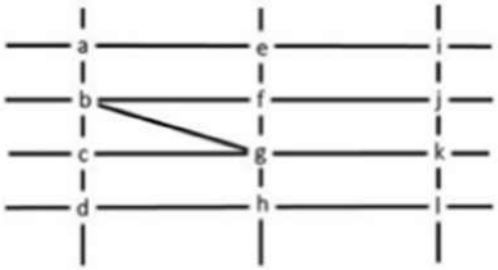


The above mentioned case is the only case possible.

V can see U and Z only.

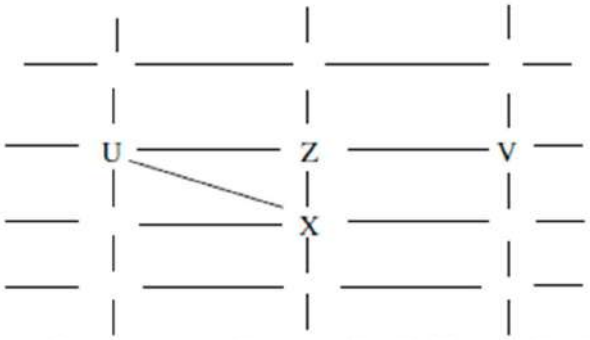
19. Correct Answer- D

Point 1, Only 2 triangles are possible, BCG and BFG. X, U and Z are standing at these points.
Point 2, there is no one else in straight line of X.
Point 3, Y is on the straight line of U and W.
Point 4, Z and V are standing next to each other while U is also in the same row.
Point 5, W is in different row/column then of V and Z.
Point 6, d is empty.



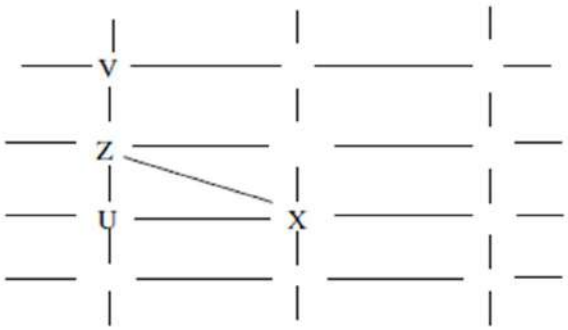
Following are the possible cases:

Case 1:



W cannot see V or Z. So W can only be at the intersection a. Since Y can see only U and W, Y can only be at c where X can see him. Hence this case is rejected.

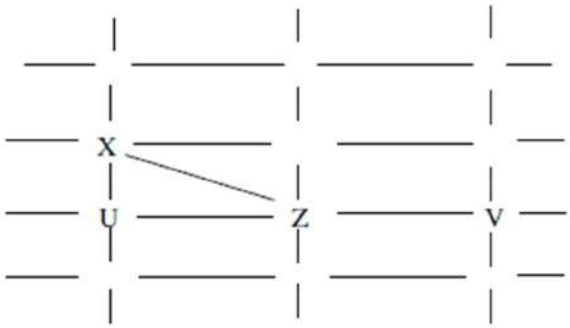
Case 2:



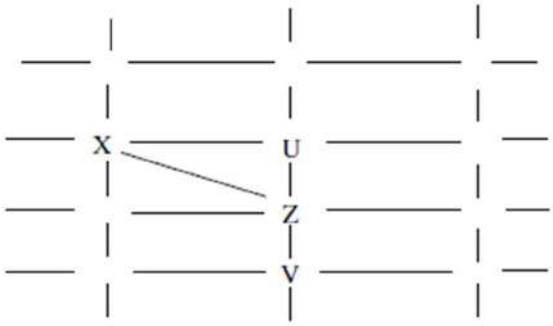
Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

Case 3:

Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

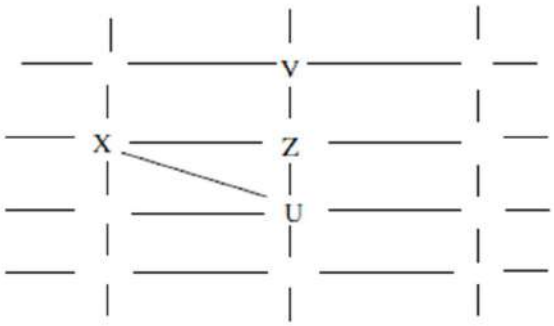


Case 4:

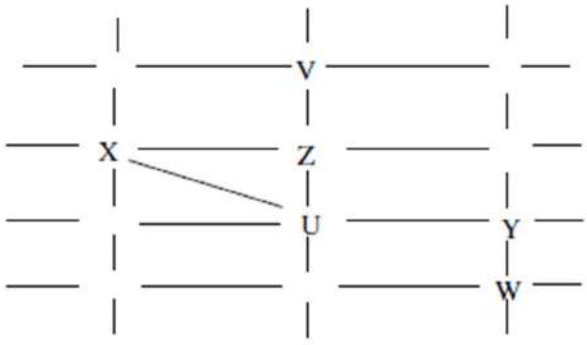


Here W cannot see V or Z and X cannot see W so W can only be placed at i. Y can see only U and W. Y can only be placed at j or e, where he can see more people than U and W. Hence this case is also rejected.

Case 5:



W cannot see V or Z. Y can only see U and W. Hence W and Y can only be placed as shown:

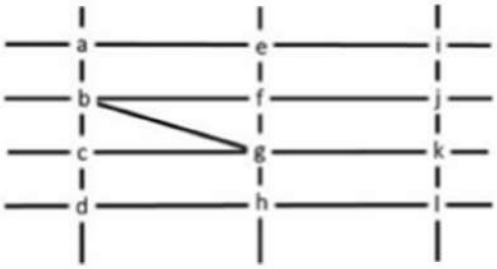


The above mentioned case is the only case possible.

X can reach Y through b-g, g-k.
So minimum 2 street segments need to be crossed

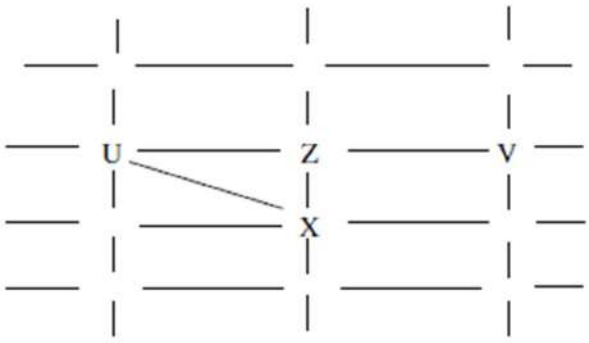
20. Correct Answer – C

Point 1, Only 2 triangles are possible, BCG and BFG. X, U and Z are standing at these points.
Point 2, there is no one else in straight line of X.
Point 3, Y is on the straight line of U and W.
Point 4, Z and V are standing next to each other while U is also in the same row.
Point 5, W is in different row/column then of V and Z.
Point 6, d is empty.



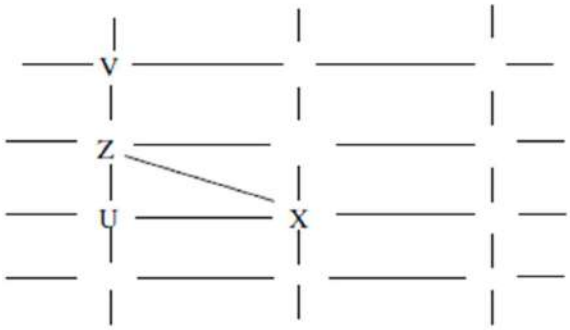
Following are the possible cases:

Case 1:



W cannot see V or Z. So W can only be at the intersection a. Since Y can see only U and W, Y can only be at c where X can see him. Hence this case is rejected.

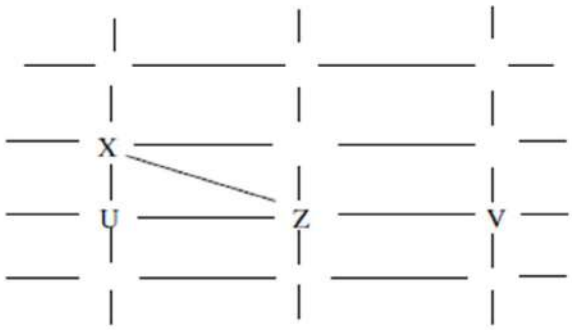
Case 2:



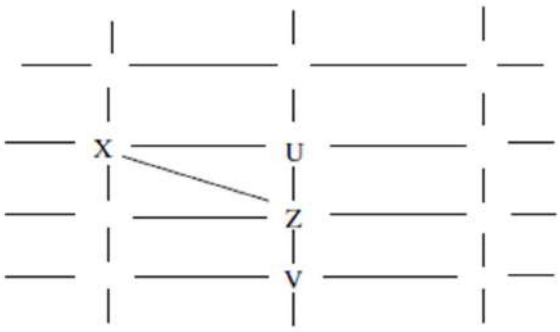
Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

Case 3:

Y can only see U and W. Y cannot be placed anywhere. Hence this case is also rejected.

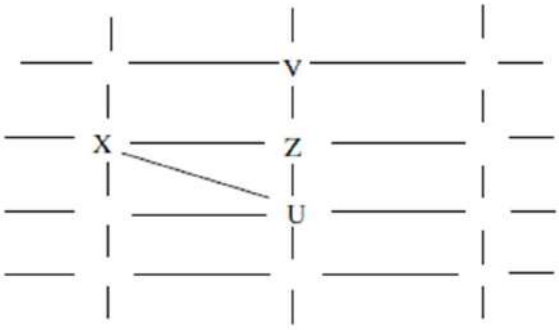


Case 4:

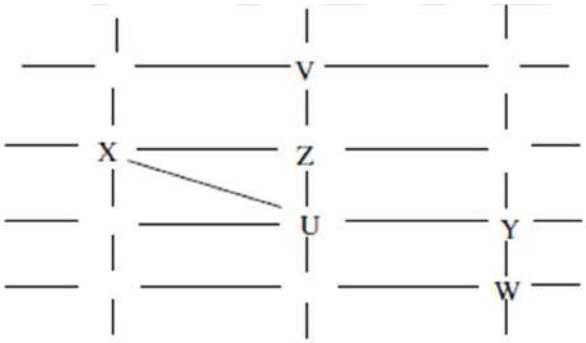


Here W cannot see V or Z and X cannot see W so W can only be placed at i. Y can see only U and W. Y can only be placed at j or e, where he can see more people than U and W. Hence this case is also rejected.

Case 5:



W cannot see V or Z. Y can only see U and W. Hence W and Y can only be placed as shown:



The above mentioned case is the only case possible.

The person standing at d can see X and W only.

21. Correct Answer – A

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
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	

In this, First thing that we can conclude is that those who played 1 round out of round 4, 5 and 6 must have scored one 5 in their first 3 shots. Similarly 2 and 3 can be concluded.
By this, Xyla must have scored 5 in each round. Tanzi scored a 5 in either round 1 or 3. Umeza must have scored 2 5's in 3 rounds. And so on. Accordingly, we can also put a bracket of possible scores for each of them.
For example, Tanzi scored a 4 in round 2 and 5 in round 5 and also a 5 in either round 1 or 3. Hence Tanzi's total score out of these 3 round can be 14. In the remaining round, Tanzi could have scored 1-4 (not 5 because then round 5 would also be there).

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15-18
Umeza	-	-	-	1	2	NP	14-17
Wangdu	-	4	-	NP	NP	NP	6-12
Xyla	5	5	5	1	5	-	22-26
Yonita	-	-	3	5	NP	NP	14-17
Zeneca	-	-	-	5	5	NP	21-24

By point 1, Tanzi, Umeza and Yonita had same score. So possible scores for these 3 would be 15-17.
By point 2, only 1 player had scored a non 3x score. Combining this with point 1, we see that possible scores for the can only be 15 or else there will be 3 people with non 3x score.
By point 3, Highest is one more than double of lowest. As we see that highest possible score is 22-26, lowest can only be 11-12. If 11, highest would be 23 and if 12, highest would be 25.
As only one of these could have had a non 3x score, we can eliminate 11 and 23.
So Possible scores now are

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	-	4	-	NP	NP	NP	12
Xyla	5	5	5	1	5	-	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

We can fill some of the scores as per total, in each round.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

Tanzi: 5/1, Umeza: 5/5/2, Yonita: 5/2 and Zeneca: 5/5/(1/4)
By point 4, 5 in round 1 are double than round 3.
Now if there is only 1 bullseye in round 3. Umeza and Zeneca doesn't score 5 in round 3, then they must score 5 in round 2. This will make 5's in round 2 more than 2. So the case is invalid.

That means there must be 4 bullseyes in round 2.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	5	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	-	5	-	5	5	NP	21/24

By point 5, Tanzi and Zeneca had same score in round 1 but different in round 3.

So one of them must have scored a 5 in either round 1 or 3. This means there are 2 bullseye in round 3 and Umeza must have only.

Concluding from this,

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

22. Correct Answer – D

Of its nostalgic association with a pre-industrial past

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
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	

In this, First thing that we can conclude is that those who played 1 round out of round 4, 5 and 6 must have scored one 5 in their first 3 shots. Similarly 2 and 3 can be concluded.
By this, Xyla must have scored 5 in each round. Tanzi scored a 5 in either round 1 or 3. Umeza must have scored 2 5's in 3 rounds. And so on. Accordingly, we can also put a bracket of possible scores for each of them.
For example, Tanzi scored a 4 in round 2 and 5 in round 5 and also a 5 in either round 1 or 3. Hence Tanzi's total score out of these 3 round can be 14. In the remaining round, Tanzi could have scored 1-4 (not 5 because then round 5 would also be there).

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15-18
Umeza	-	-	-	1	2	NP	14-17
Wangdu	-	4	-	NP	NP	NP	6-12
Xyla	5	5	5	1	5	-	22-26
Yonita	-	-	3	5	NP	NP	14-17
Zeneca	-	-	-	5	5	NP	21-24

By point 1, Tanzi, Umeza and Yonita had same score. So possible scores for these 3 would be 15-17.
By point 2, only 1 player had scored a non 3x score. Combining this with point 1, we see that possible scores for the can only be 15 or else there will be 3 people with non 3x score.
By point 3, Highest is one more than double of lowest. As we see that highest possible score is 22-26, lowest can only be 11-12. If 11, highest would be 23 and if 12, highest would be 25.
As only one of these could have had a non 3x score, we can eliminate 11 and 23.

So Possible scores now are

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	-	4	-	NP	NP	NP	12
Xyla	5	5	5	1	5	-	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

We can fill some of the scores as per total, in each round.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

Tanzi: 5/1, Umeza: 5/5/2, Yonita: 5/2 and Zeneca: 5/5/(1/4)
By point 4, 5 in round 1 are double than round 3.
Now if there is only 1 bullseye in round 3. Umeza and Zeneca doesn't score 5 in round 3, then they must score 5 in round 2. This will make 5's in round 2 more than 2. So the case is invalid.

That means there must be 4 bullseyes in round 2.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	5	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	-	5	-	5	5	NP	21/24

By point 5, Tanzi and Zeneca had same score in round 1 but different in round 3.

So one of them must have scored a 5 in either round 1 or 3. This means there are 2 bullseye in round 3 and Umeza must have scored it in round 3 only.

Concluding from this,

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

23. Correct Answer – B

Of its nostalgic association with a pre-industrial past

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
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	

In this, First thing that we can conclude is that those who played 1 round out of round 4, 5 and 6 must have scored one 5 in their first 3 shots. Similarly 2 and 3 can be concluded.
By this, Xyla must have scored 5 in each round. Tanzi scored a 5 in either round 1 or 3. Umeza must have scored 2 5's in 3 rounds. And so on. Accordingly, we can also put a bracket of possible scores for each of them.
For example, Tanzi scored a 4 in round 2 and 5 in round 5 and also a 5 in either round 1 or 3. Hence Tanzi's total score out of these 3 round can be 14. In the remaining round, Tanzi could have scored 1-4 (not 5 because then round 5 would also be there).

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15-18
Umeza	-	-	-	1	2	NP	14-17
Wangdu	-	4	-	NP	NP	NP	6-12
Xyla	5	5	5	1	5	-	22-26
Yonita	-	-	3	5	NP	NP	14-17
Zeneca	-	-	-	5	5	NP	21-24

By point 1, Tanzi, Umeza and Yonita had same score. So possible scores for these 3 would be 15-17.
By point 2, only 1 player had scored a non 3x score. Combining this with point 1, we see that possible scores for the can only be 15 or else there will be 3 people with non 3x score.
By point 3, Highest is one more than double of lowest. As we see that highest possible score is 22-26, lowest can only be 11-12. If 11, highest would be 23 and if 12, highest would be 25.
As only one of these could have had a non 3x score, we can eliminate 11 and 23.
So Possible scores now are

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	-	4	-	NP	NP	NP	12
Xyla	5	5	5	1	5	-	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

We can fill some of the scores as per total, in each round.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

Tanzi: 5/1, Umeza: 5/5/2, Yonita: 5/2 and Zeneca: 5/5/(1/4)
By point 4, 5 in round 1 are double than round 3.
Now if there is only 1 bullseye in round 3. Umeza and Zeneca doesn't score 5 in round 3, then they must score 5 in round 2. This will make 5's in round 2 more than 2. So the case is invalid.

That means there must be 4 bullseyes in round 2.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
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Umeza	-	5	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	-	5	-	5	5	NP	21/24

By point 5, Tanzi and Zeneca had same score in round 1 but different in round 3.

So one of them must have scored a 5 in either round 1 or 3. This means there are 2 bullseye in round 3 and Umeza must have scored it in round 3 only.

Concluding from this,

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

Xyla was the highest scorer

24. Correct Answer – C

Of its nostalgic association with a pre-industrial past

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
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	

In this, First thing that we can conclude is that those who played 1 round out of round 4, 5 and 6 must have scored one 5 in their first 3 shots. Similarly 2 and 3 can be concluded.
By this, Xyla must have scored 5 in each round. Tanzi scored a 5 in either round 1 or 3. Umeza must have scored 2 5's in 3 rounds. And so on. Accordingly, we can also put a bracket of possible scores for each of them.
For example, Tanzi scored a 4 in round 2 and 5 in round 5 and also a 5 in either round 1 or 3. Hence Tanzi's total score out of these 3 round can be 14. In the remaining round, Tanzi could have scored 1-4 (not 5 because then round 5 would also be there).

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15-18
Umeza	-	-	-	1	2	NP	14-17
Wangdu	-	4	-	NP	NP	NP	6-12
Xyla	5	5	5	1	5	-	22-26
Yonita	-	-	3	5	NP	NP	14-17
Zeneca	-	-	-	5	5	NP	21-24

By point 1, Tanzi, Umeza and Yonita had same score. So possible scores for these 3 would be 15-17.
By point 2, only 1 player had scored a non 3x score. Combining this with point 1, we see that possible scores for the can only be 15 or else there will be 3 people with non 3x score.
By point 3, Highest is one more than double of lowest. As we see that highest possible score is 22-26, lowest can only be 11-12. If 11, highest would be 23 and if 12, highest would be 25.
As only one of these could have had a non 3x score, we can eliminate 11 and 23.

So Possible scores now are

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	-	4	-	NP	NP	NP	12
Xyla	5	5	5	1	5	-	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

We can fill some of the scores as per total, in each round.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	-	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	-	-	3	5	NP	NP	15
Zeneca	-	-	-	5	5	NP	21/24

Tanzi: 5/1, Umeza: 5/5/2, Yonita: 5/2 and Zeneca: 5/5/(1/4)
By point 4, 5 in round 1 are double than round 3.
Now if there is only 1 bullseye in round 3. Umeza and Zeneca doesn't score 5 in round 3, then they must score 5 in round 2. This will make 5's in round 2 more than 2. So the case is invalid.

That means there must be 4 bullseyes in round 2.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Total
Tanzi	-	4	-	5	NP	NP	15
Umeza	-	5	-	1	2	NP	15
Wangdu	4	4	4	NP	NP	NP	12
Xyla	5	5	5	1	5	4	25
Yonita	2	5	3	5	NP	NP	15
Zeneca	-	5	-	5	5	NP	21/24

By point 5, Tanzi and Zeneca had same score in round 1 but different in round 3.

So one of them must have scored a 5 in either round 1 or 3. This means there are 2 bullseye in round 3 and Umeza must have scored it in round 3 only.

Concluding from this,

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

1

25. Correct Answer – 5

	IPC	SLL	Others	Total
Telengana	4	15	6	25
Puducherry	1		30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	15	35	6	56
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	49	26	91
Delhi	64	36	45	145
West Bengal	0	520	0	520

So that is the rank of Kerala in the 'IPC crimes' category is 5.

26. Correct Answer – C

	IPC	SLL	Others	Total
Telengana	4	15	6	25
Puducherry	1		30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	15	35	6	56
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	49	26	91
Delhi	64	36	45	145
West Bengal	0	520	0	520

The ratio of the total number of cases in IPC crimes to the total number in SLL crimes is in the two states where the highest total number of cases are registered =64:520+36=64:556=1:9

27. Correct Answer – A

	IPC	SLL	Others	Total
Telengana	4	15	6	25
Puducherry	1		30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	15	35	6	56
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	49	26	91
Delhi	64	36	45	145
West Bengal	0	520	0	520

28. Correct Answer – B

	IPC	SLL	Others	Total
Telengana	4	15	6	25
Puducherry	1		30	31
Kerala	8	15	12	35
Haryana	3	28	7	38
Maharashtra	15	35	6	56
Tamil Nadu	2	25	36	63
Goa	27	34	19	80
Karnataka	16	49	26	91
Delhi	64	36	45	145
West Bengal	0	520	0	520

Delhi's rank in IPC is 1
Delhi's Rank in SLL is 3 (consider West Bengal also as West Bengalis at rank 1)
Delhi's rank in OTHERS is 1
Sum of ranks = 5

29. Correct Answer – C

Median scores will be the third score in ascending or descending order for any of the 6 aspects. Checking for above 4 aspects, we get median scores as
Quality =62
Reliability=54
Cost=78
Customer Service=50
Least score is for Customer service.

30. Correct Answer – D

	Cost	Customer Service	Features	Reach	Quality	Reliability	Total
Vender 1	77	55	40	80	72	52	376
Vender 2	82	42	45	58	69	40	336
Vender 3	90	50	55	62	62	75	394
Vender 4	72	70	90	45	40	26	343

Vender 3 has highest final score.

31. Correct Answer- B

If we see the top 2 venders for each of the 6 aspects we will find our answer

	Top 2 Vendors
Cost	2,3
Customer Service	4,1
Features	4,5
Reach	1,5
Quality	1,2
Reliability	3,5

Vendor 1 and 5 comes for 3 times. Thus Vendor 1 and vendor 5 is our answer.

32. Correct Answer – C

We will look for top 3 vendors in all aspects

	Top 3 Vendors
Cost	2,3,1
Customer Service	4,1,3
Features	4,5,3
Reach	1,5,3
Quality	1,2,3
Reliability	3,5,1

Vendor 3 comes for maximum number of time. Thus vendor 3 will be our answer.

33. Correct Answer: C

We will look for top 3 vendors in all aspects

	Top 3 Vendors
Cost	2,3,1
Customer Service	4,1,3
Features	4,5,3
Reach	1,5,3
Quality	1,2,3
Reliability	3,5,1

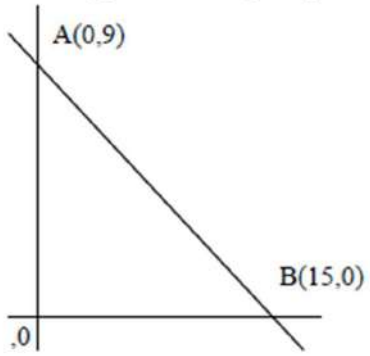
Vendor 3 comes for maximum number of time. Thus vendor 3 will be our answer.

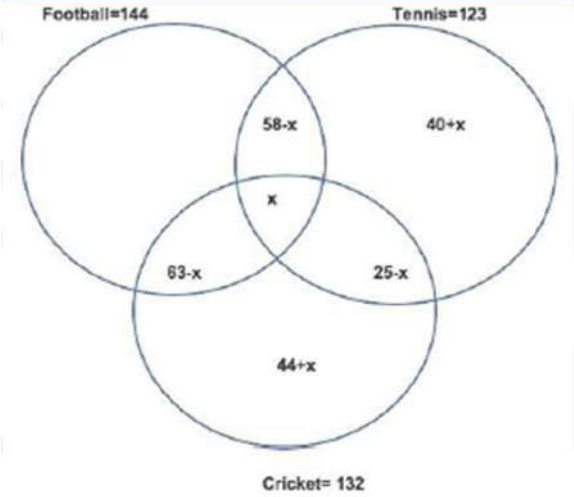
QUANT

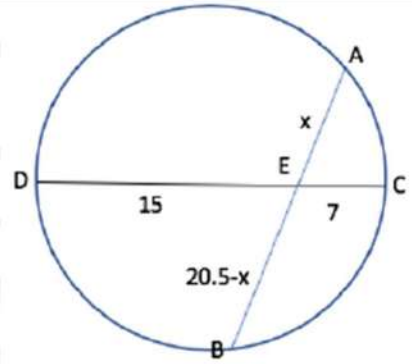
Sr.No	Correct Answer	Explanation
1	9	Total = 15 lakh Let the amount invested in fixed deposit be = x at 6% SI Remaining amount = 15-x… which was invested in 2:1 at rates 4% and 3% per annum So amount invested at 4% pa = 2/3 (15-x) Amount invested at 3% pa = 1/3 (15-x) Total interest after 1 year = 76000 = 0.76 lakh So, (x×6×1)/100 + [2/3(15-x)×4×1]/100 + [1/3(15-x)×3×1]/100 = 0.76 x = 9 lakh So 9 lakh will be the answer.
2	880	A beat B by 11 and A beat C by 90m. That means B is already 79 m ahead of C. Now B will beat C by 80m and B is already 79m ahead so B will gain 1m lead in next 11m. So lead of 80m will be in the span of 80 × 11 = 880m
3	D	$5.55^x = 1000$ $5.55 = 1000^{1/x}$ … eq1 $0.555^y = 1000$ $0.555 = 1000^{1/y}$… eq2 Dividing eq 1 and 2 $10 = 1000^{(1/x-1/y)}$ So $1/x - 1/y = 1/3$
4	C	Let the income of Bimala is Rs. 100. So income of Amala is Rs. 120 and that of Kamala is Rs. 150. In second case, the income of Bimala beco Rs. 110 and that of Kamala, it becomes Rs. 144. Required %age = $\frac{144-110}{110}\times 100 = \frac{34}{110}\times 100 = 30.9 \approx 31\%$
5	3	As f(x+y) = f(x) f(y) Now f(1) = 2, f(2) = f(1 + 1) = f(1) f(1) = 2 × 2 = 4 f(3) = f(2 + 1) = f(2) f(1) = 4 × 2 = 8 $\Rightarrow f(x) = b^x$ Given that $f(a+1) + f(a+2) + f(a+3) + \ldots\ldots + f(a+n) = 16(2^n - 1)$ $\Rightarrow 2^{a+1} + 2^{a+2} + 2a^{+3} + \ldots\ldots + 2^{a+n} = 16(2^n - 1)$ $\Rightarrow \frac{2^{a+1}(2^n - 1)}{2-1} = 16(2^n - 1)$ $\Rightarrow 2^{a+1} = 16 = 2^4 \Rightarrow a + 1 = 4 \Rightarrow a = 3$

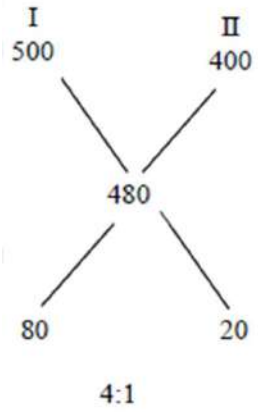
6	10	$We\ have\ f(n)=\begin{cases} n(n+1), if\ n is\ even. \\ n+3,\ if\ n is\ odd. \end{cases}$ Case I: If 'm' is odd :- m + 1 is even $\therefore$ 8 f(m+1) - f(m) = 2 $\Rightarrow$ 8 (m+1) (m+2) - (m + 3) = 2 $\Rightarrow 8(m^2 + 3m + 2) - m - 5 = 0$ $\Rightarrow 8m^2 + 24m + 16 - m - 5 = 0$ $\Rightarrow 8m^2 + 23m + 11 = 0$ Its discriminant = $(23)^2 - 4 \times 8 \times 11 = 529 - 352 = 177$ As the discriminant is not a perfect square, so we will not get integral val Case II: If 'm' is even :- m +1 is odd $\therefore$ 8 f(m+1) - f(m) = 2 $\Rightarrow$ 8(m+4) - m(m+1) = 2 $\Rightarrow 8m + 32 - m^2 - m = 2$ $\Rightarrow m^2 - 7m - 30 = 0$ $\Rightarrow$ (m -10) (m+3) = 0 $\Rightarrow$ m = 10, -3 A 'm' is +ve integer $\Rightarrow$ m = 10
7	B	Let the boys are x. So girls are x + 30 Total students = 2x + 30 Given that $(2x + 30) \times 0.6 = x + 30$ $\Rightarrow 1.2x + 18 = x + 30$ $\Rightarrow 0.2x = 12 \Rightarrow x = 60$ $\therefore$ Boys = 60 and girls = 90 $\therefore$ Total students = 150 Students who passed the exam = 68% of 150 = 102 $\therefore$ Girls passed the exam = 102 - 30 = 72 $\therefore$ Girls who failed = 90 - 72 = 18 $\therefore$ Required percentage = $\frac{18}{90} \times 100 = 20\%$

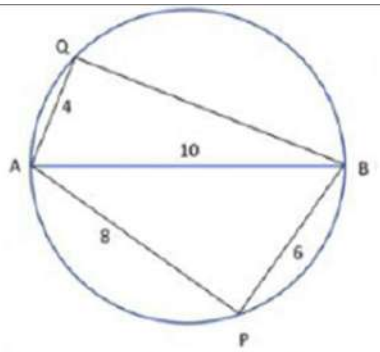
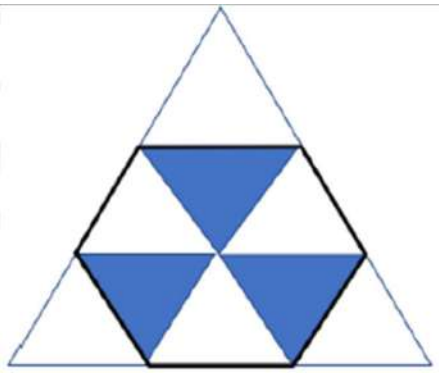
8	A	$a_1 = 6$ $a_1 + a_2 = 18$ $a_2 = 12$ $a_1 + a_2 + a_3 = 42$ $a_3 = 24$ $a_1 + a_2 + a_3 + a_4 = 90$ $a_4 = 48$ So $a_1, a_2, a_3, a_4 \ldots a_n$ are in GP with ratio 2. So $a_{11} = 6\,(2^{10}) = 6(1024) = 6144$
9	A	Suppose first car starts 10:00 and it travelled for 6 hour. Assume speed of car 1 is 10km/h. S Now car B will travel same distance in 5 hour so speeed of car B = 60/5 = 12 km/hr Percentage change = 2/10 × 100 = 20% Now if we take 7 hours instead of 6 hours, then the distance travelled by first car = 70 km This is the distance travelled by the second car in 6 hours. Speed of second car = 70/6 = 11.67 km/hr Percentage change = 1.67×100/10 = 16.7% So percentage change is less than 20%. So at max it can be 20%
10	5	Case I: If $x \geq 0 \Rightarrow |x| = x$. $\therefore |x|\,(6x^2 + 1) = 5x^2$ $\Rightarrow x(6x^2 + 1) = 5x^2$ $\Rightarrow x(6x^2 - 5x + 1) = 0$ $\Rightarrow x(3x-1)\,(2x-1) = 0$ $\Rightarrow x = 0, \frac{1}{3}, \frac{1}{2}$ Case II: if $x < 0 \Rightarrow |x| = -x$ $\therefore |x|\,(6x^2 + 1) = 5x^2$ $\Rightarrow -x(6x^2 + 1) = 5x^2$ $\Rightarrow x(6x^2 + 5x + 1) = 0$ $\Rightarrow (6x^2 + 5x + 1) = 0$ [$\because x < 0$] $\Rightarrow (3x + 1)\,(2x + 1) = 0$ $x = \frac{-1}{3}, \frac{-1}{2}$ $\therefore$ total 5 solution are possible

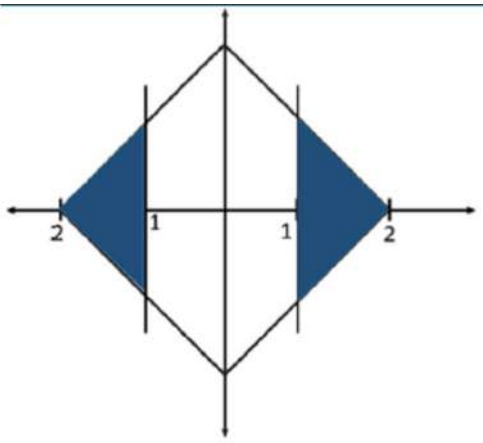
11	9	Plotting the equation of given line, $3x + 5y - 45 = 0$ At $x = 0$, $y = 9$ and at $y = 0$, $x = 15$  => A (0, 9) and B (15, 0) are points lying on coordinate axes where the line Length of the hypotenuse AB = $\sqrt{(15^2 + 9^2)} \approx 17.5$ Hence, Circumradius = $1/2 \times$ hypotenuse (AB) $= 1/2 \times 17.5 = 8.75 \approx 9$
12	A	Let a, b and c be the three sides. So, $a^2 + b^2 = 9$ ..... (1) $b^2 + c^2 = 12$ ..... (2) $c^2 + a^2 = 15$ .....(3) adding above three equations we have, $2a^2 + 2b^2 + 2c^2 = 36$ $a^2 + b^2 + c^2 = 18$ ..... (4) from (1) and (4) So, $c^2 = 9$, $c = 3$ from (2) and (4) $a = \sqrt{6}$ from (3) and (4) $b = \sqrt{3}$ So, ratio of shortest to longest = $1 : \sqrt{3}$

13	B	Given $\log_5 (x + y) + \log_5 (x - y) = 3$ and $\log_2 y - \log_2 x = 1 - \log_2 3$. $\text{Log}_5 (x + y) + \log_5 (x - y) = \log_5 (x^2-y^2) = 3$ $\Rightarrow x^2-y^2 = 5^3$ .....(1) $\log_2 y - \log_2 x = 1 - \log_2 3$ $\log_2 (y/x) = \log_2 2 - \log_2 3$ $\log_2 (y/x) = \log_2 2/3$ $y/x = 2/3$ $x = 3y/2$ ..... putting this in eq (1) $9y^2/4-y^2 = 125$ $y^2=100$ $y = 10$ $x = 15$ $xy = 150$
14	B	 Total $144 + 109 + x = 256$ $x = 3$ So, only tennis = $40 + x = 43$

15	A	Here $xy = 616$ Also, $(x^3 - y^3)/(x-y)^3 = 157/3$ Now, $x^3 - y^3 = (x-y)(x^2 + y^2 + xy)$ So, $(x^2 + y^2 + xy)/(x^2 + y^2 - 2xy) = 157/3$ Let, $x^2 + y^2 = t$ So, $(t + 616)/(t-1232) = 157/3$ $t = 1268$ $x^2 + y^2 = 1268$ $(x + y)^2 - 2xy = 1268$ $(x + y)^2 - 2 \times 616 = 1268$ $(x + y)^2 = 2500$ $x + y = 50$
16	D	 When two chords intersect inside a circle then AE×BE = CE × DE So x (20.5-x) = 15 × 7 So x = 10.5 So AE = 10.5 BE = 10 Difference in lengths = 0.5
17	13	It is given that $(3M + 8M_C) \times x = (8M + 3M_C) \times 2x$ $\Rightarrow 3M + 8M_C = 16M + 6M_C$ $\Rightarrow 13M = 2M_C$ $\Rightarrow 1\ M_C = \frac{13}{2}$ Men 2 Machines can do the work in 13 days ⇒ 1 Machine can do it in 26 days So 13/2 Men can do the work in 26 days ⇒ 13 Men can do it in 13 days
18	A	Let money invested be in ratio 300x:400x:500x Bina's interest income = 400x× 5 × 1/100 Amala's interest income = 300x × 6 × 1/100

		Difference = 2x = 250 => x = 125 Total interest income = 20x + 18x + 20x = 58x = 58 × 125 = 7250
19	D	We have $\|x^2 - x - 6\| = x + 2 \Rightarrow x^2 - x - 6 = \pm (x + 2)$ Case I: If $x^2 - x - 6 = x + 2 \Rightarrow x^2 - 2x - 8 = 0$ $\Rightarrow (x - 4)(x + 2) = 0 \Rightarrow x = 4, -2$ Case II: If $x^2 - x - 6 = -(x+2)$ $\Rightarrow x^2 - x - 6 = -x-2$ $\Rightarrow x^2 = 4 \Rightarrow x = 2, -2$ $\therefore$ Product of distinct roots $= 4 \times 2 \times (-2) = -16$
20	D	Since in LHS we have cosθ whose value lies from −1 to 1 So LHS can have value from −2 to 2 RHS will always be ≥ 2 Since $2^x + 2^{-x} = (2^x) + (1/2^x)$ and we know that sum of a number and its reciprocal is always greater than or equal to 2 if is real using A So they intersect only once at x = 0 when value of LHS and RHS is 2
21	A	One litre of liquid 1 weight 1 kg. ⇒ Half litre of liquid 1 weighs 500 gm Similarly half litre of liquid 2 weighs 400 gm Using the rule of alligation  4:1 $\therefore$ Ratio of liquid 1 and liquid 2 is 4:1 $\therefore$ liquid 1 is 4/5× 100 = 80% of the mixture

22	C	 Here ∠AQB = ∠APB= 90° Since angle is a semicircle is 90° now as AB = 10 and PB = 6 so AP = 8 therefore AQ = 4 (as the length of A So $AQ^2 + QB^2 = AB^2$ $100 = 16 + QB^2$ $QB = (84)^{1/2} = 9.1$ approx.
23	B	 We can see that the equilateral triangle is made up of 9 equal triangles Hexagon is made up of 6 equal triangles of same size So ratio of areas = 6/9 = 2/3

24	A	 Here we have required area shaded in blue where we have 4 triangle having So total area = $4 \times (1/2 \times 1 \times 1) = 2$ units
25	D	Let the score of Gautam = x $\therefore$ Total score = $21 \times 62 + x = 1302 + x$ …… (1) Let the average of 21 students other than Ramesh is y $\therefore 21y + 82.5 = 22(y+1)$ $\Rightarrow 21y + 82.5 = 22y + 22$ $\Rightarrow y = 60.5$ $\therefore$ Total score = $22 \times 61.5 = 1353$ …….. (2) (1) & (2) $\Rightarrow 1302 + x = 1353 \Rightarrow x = 51$
26	D	Taking n = 3 and assuming $a_1 = 1$, $a_2 = 2$, $a_3 = 3$, $a_4 = 4$ $\frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}}$ Rationalizing the denominator of all term, we got $\frac{1}{\sqrt{2}+\sqrt{1}} \times \frac{\sqrt{2}-\sqrt{1}}{\sqrt{2}-\sqrt{1}} + \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} + \frac{1}{\sqrt{4}+\sqrt{3}} \times \frac{\sqrt{4}-\sqrt{3}}{\sqrt{4}-\sqrt{3}}$ $\Rightarrow \frac{\sqrt{2}-\sqrt{1}}{1} + \frac{\sqrt{3}-\sqrt{2}}{1} + \frac{\sqrt{4}-\sqrt{3}}{1} \Rightarrow \sqrt{2}-\sqrt{1}+\sqrt{3}-\sqrt{2}+\sqrt{4}-\sqrt{3}$ $\Rightarrow \sqrt{4}-\sqrt{1} = 2-1 = 1$ Now, using option In option (4) $\frac{3}{\sqrt{1}+\sqrt{4}} \Rightarrow \frac{3}{3} = 1$ So only option (4) satisfies
27	C	Let A can do 2x units per day and B can do y units per day As per the question $12(2x+y) = 9(x + 3y)$ $\Rightarrow 24x + 12y = 9x + 27y$ $\Rightarrow 15x = 15y \Rightarrow x = y$ Let x= y = 1, so A will do 2 units/day and B will don 1 units/day $\therefore$ Total work = 12 (2+1) = 36 units

		∴ A alone will do it in 36/2 = 18 days
28	A	Let total distance = 60km So, Bimal will travel 1/3rd of total distance for each given speed That means with the speed of 10 he will travel for 20 km = 2 hour And with the speed of 20 km/h he will travel for 20 km = 1 hour And with the speed of 30 km he will travel for 20 km = 2/3 hour So, total time = 3hour 40 min = 220 min Now, for Amal 1/3rd of total travel time means with the speed 20 it will travel for 1 hour, with the speed of 10 he will travel for 1 hour and speed of 30 it will travel of 1 hour. So, total 3 hour = 180 min So, $\frac{40}{180} \times 100 = 22.22\% = 22\%$
29	D	Let total marks be x Meena score 0.4x After review marks are increased by 50% So new marks = 0.4x × 1.5 = 0.6x But she still fails by 35 marks So passing mark = 0.6x + 35 Now if this post review score is increased by 20% So it becomes 1.2 × 0.6x, she gets 7 marks more than passing marks That means passing marks = 1.2 × 0.6x – 7 = 0.72x – 7 Equating passing marks in both the cases 0.6x + 35 = 0.72x – 7 0.12x = 42 X = 350 So passing marks = 350 × 0.6 + 35 = 245 So percentage marks required to pass = 245/350 × 100 = 70%
30	B	Let CP of Pen = x and CP of book =y ATQ 0.95x + 1.15y = x + y + 7 -0.05x + 0.15y = 7 ------(1) and 1.05x + 1.10y = x + y + 13 0.05x + 0.1y = 13 ------(2) Adding (1) and (2) We get 0.25y = 20 So, y = 80

31	A	A travel $2\pi r = 60\pi$ B travel $2\pi r = 80\pi$ So LCM = 240π That means A travel for 4 revolution and B travel for 3 revolution. We need gap of 5000 revolution So B will travel $5000 \times 240\pi$ cm distance in 45 min So speed = $5000 \times 240\pi$ / 45cm / min To convert cm into km 1 km = 1000m and 1 m = 100cm So, 1 km = 100000cm, So 1cm = 10^{-5}km And 60 min = 1 hour $\text{So, speed} = 5000\times 240\pi\frac{60}{45}\times\frac{1}{100000} = 16\pi$
32	3920	We want to go to (1, 1) to (8, 10) through (4, 6) So, first we will go to (1, 1) to (4, 6) and then (4, 6) to (8, 10) So from (1, 1) to (4, 6) we have 5 + 3 = 8 ways = $\frac{8!}{5!3!} = 56$ And from (4, 6) to (8, 10) we have 4 + 4 = 8 ways So, $\frac{8!}{4!4!} = 70$ So, total $56 \times 70 = 3920$ ways
33	D	$2^{(19/2+4+3n)}\times 3^{(4+2m)} = 2^{(3/2+4m)}\times 3^{(n)}$ Comparing powers of 2 and 3 in LHS and RHS 3n + 12 = 4m 4m – 3n = 12 And 4+2m = n 2m – n= - 4 Solving both n = - 20 and m = - 12
34	A	Population in 2019 = 1000 Population in 2020 = 1000× 2 +3 = 2003 = (1003) × 2-3 Population in 2021 = 2 × 2003 + 3 = 4009 = 4 × (1003) - 3 = 2^2 (1003) - Population in 2022 = 2(4009) + 3 = 8021 = 8(1003) - 3 = 2^3 (1003) -3 ∴ we can see that population in 2034 is 2^{15} (1003) - 3