

CAT 2023 SLOT 1 VARC

Direction for question 1 to 4: The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

For early postcolonial literature, the world of the novel was often the nation. Postcolonial novels were usually [concerned with] national questions. Sometimes the whole story of the novel was taken as an allegory of the nation, whether India or Tanzania. This was important for supporting anti-colonial nationalism, but could also be limiting – land-focused and inward looking.

My new book “Writing Ocean Worlds” explores another kind of world of the novel: not the village or nation, but the Indian Ocean world. The book describes a set of novels in which the Indian Ocean is at the center of the story. It focuses on the novelists Amitav Ghosh, Abdulrazak Gurnah, Lindsey Collen and Joseph Conrad [who have] centered the Indian Ocean world in the majority of their novels. . . . Their work reveals a world that is outward-looking – full of movement, border-crossing and south-south interconnection. They are all very different – from colonially inclined (Conrad) to radically anti-capitalist (Collen), but together draw on and shape a wider sense of Indian Ocean space through themes, images, metaphors and language. This has the effect of remapping the world in the reader’s mind, as centered in the interconnected global south. . . .

The Indian Ocean world is a term used to describe the very long-lasting connections among the coasts of East Africa, the Arab coasts, and South and East Asia. These connections were made possible by the geography of the Indian Ocean. For much of history, travel by sea was much easier than by land, which meant that port cities very far apart were often more easily connected to each other than to much closer inland cities. Historical and archaeological evidence suggests that what we now call globalisation first appeared in the Indian Ocean. This is the interconnected oceanic world referenced and produced by the novels in my book. .

For their part Ghosh, Gurnah, Collen and even Conrad references a different set of histories and geographies than the ones most commonly found in fiction in English. Those [commonly found ones] are mostly centered in Europe or the US, assume a background of Christianity and whiteness, and mention places like Paris and New York. The novels in [my] book highlight instead a largely Islamic space, feature characters of colour and centralise the ports of Malindi, Mombasa, Aden, Java and Bombay. . . . It is a densely imagined, richly sensory image of a southern cosmopolitan culture which provides for an enlarged sense of place in the world.

This remapping is particularly powerful for the representation of Africa. In the fiction, sailors and travellers are not all European. . . . African, as well as Indian and Arab characters, are traders, nakhodas (dhow ship captains), runaways, villains, missionaries and activists. This does not mean that Indian Ocean Africa is romanticised. Migration is often a matter of force; travel is portrayed as abandonment rather than adventure, freedoms are kept from women and slavery is rife. What it does mean is that the African part of the Indian Ocean world plays an active role in its long, rich history and therefore in that of the wider world.

1. On the basis of the nature of the relationship between the items in each pair below, choose the odd pair out:

- [A] Postcolonial novels: Anti-colonial nationalism
- [B] Indian Ocean novels: Outward-looking
- [C] Indian Ocean world: Slavery
- [D] Postcolonial novels: Border-crossing

2. All of the following statements, if true, would weaken the passage's claim about the relationship between mainstream English-language fiction and Indian Ocean novels EXCEPT:

- [A] the depiction of Africa in most Indian Ocean novels is driven by a postcolonial nostalgia for an idyllic past.
- [B] most mainstream English-language novels have historically privileged the Christian, white, male experience of travel and adventure
- [C] the depiction of Africa in most Indian Ocean novels is driven by an Orientalist imagination of its cultural crudeness
- [D] very few mainstream English-language novels have historically been set in American and European metropolitan centers

3. Which one of the following statements is not true about migration in the Indian Ocean world?

- [A] The Indian Ocean world's migration networks were shaped by religious and commercial histories of the region
- [B] Migration in the Indian Ocean world was an ambivalent experience
- [C] Geographical location rather than geographical proximity determined the choice of destination for migrants.
- [D] The Indian Ocean world's migration networks connected the global north with the global south

4. All of the following claims contribute to the "remapping" discussed by the passage, EXCEPT:

- [A] the global south, as opposed to the global north, was the first center of globalisation
- [B] cosmopolitanism originated in the West and travelled to the East through globalisation
- [C] Indian Ocean novels have gone beyond the specifics of national concerns to explore rich regional pasts
- [D] the world of early international trade and commerce was not the sole domain of white Europeans

Direction for question 5 to 8: The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Many human phenomena and characteristics – such as behaviors, beliefs, economies, genes, incomes, life expectancies, and other things – are influenced both by geographic factors and by non-geographic factors. Geographic factors mean physical and biological factors tied to geographic location, including climate, the distributions of wild plant and animal species, soils, and topography. Non-geographic factors include those factors subsumed under the term culture, other factors subsumed under the term history, and decisions by individual people. . . .

[T]he differences between the current economies of North and South Korea . . . cannot be attributed to the modest environmental differences between [them] . . . They are instead due entirely to the different [government] policies . . . At the opposite extreme, the Inuit and other traditional peoples living north of the Arctic Circle developed warm fur clothes but no agriculture, while equatorial lowland peoples around the world never developed warm fur clothes but often did develop

agriculture. The explanation is straightforwardly geographic, rather than a cultural or historical quirk unrelated to geography. . . . Aboriginal Australia remained the sole continent occupied only by hunter/gatherers and with no indigenous farming or herding . . . [Here the] explanation is biogeographic: the Australian continent has no domesticable native animal species and few domesticable native plant species. Instead, the crops and domestic animals that now make Australia a food and wool exporter are all non-native (mainly Eurasian) species such as sheep, wheat, and grapes, brought to Australia by overseas colonists.

Today, no scholar would be silly enough to deny that culture, history, and individual choices play a big role in many human phenomena. Scholars don't react to cultural, historical, and individual-agent explanations by denouncing "cultural determinism," "historical determinism," or "individual determinism," and then thinking no further. But many scholars do react to any explanation invoking some geographic role, by denouncing "geographic determinism" . . .

Several reasons may underlie this widespread but nonsensical view. One reason is that some geographic explanations advanced a century ago were racist, thereby causing all geographic explanations to become tainted by racist associations in the minds of many scholars other than geographers. But many genetic, historical, psychological, and anthropological explanations advanced a century ago were also racist, yet the validity of newer non-racist genetic etc. explanations is widely accepted today.

Another reason for reflex rejection of geographic explanations is that historians have a tradition, in their discipline, of stressing the role of contingency (a favorite word among historians) based on individual decisions and chance. Often that view is warranted . . . But often, too, that view is unwarranted. The development of warm fur clothes among the Inuit living north of the Arctic Circle was not because one influential Inuit leader persuaded other Inuit in 1783 to adopt warm fur clothes, for no good environmental reason.

A third reason is that geographic explanations usually depend on detailed technical facts of geography and other fields of scholarship . . . Most historians and economists don't acquire that detailed knowledge as part of the professional training

5. The examples of the Inuit and Aboriginal Australians are offered in the passage to show:

- [A] that despite geographical isolation, traditional societies were self-sufficient and adaptive
- [B] how physical circumstances can dictate human behaviour and cultures.
- [C] that despite geographical isolation, traditional societies were self-sufficient and adaptive.
- [D] how physical circumstances can dictate human behaviour and cultures.

6. All of the following can be inferred from the passage EXCEPT:

- [A] several academic studies of human phenomena in the past involved racist interpretations
- [B] agricultural practices changed drastically in the Australian continent after it was colonised
- [C] individual dictat and contingency were not the causal factors for the use of fur clothing in some very cold climates
- [D] while most human phenomena result from culture and individual choice, some have biogeographic origins.

7. All of the following are advanced by the author as reasons why non-geographers disregard geographic influences on human phenomena EXCEPT their:

- [A] belief in the central role of humans, unrelated to physical surroundings, in influencing phenomena
- [B] dismissal of explanations that involve geographical causes for human behaviour
- [C] lingering impressions of past geographic analyses that were politically offensive
- [D] disciplinary training which typically does not include technical knowledge of geography

8. The author criticises scholars who are not geographers for all of the following reasons EXCEPT:

- [A] the importance they place on the role of individual decisions when studying human phenomena
- [B] their outdated interpretations of past cultural and historical phenomena
- [C] their labelling of geographic explanations as deterministic.
- [D] their rejection of the role of biogeographic factors in social and cultural phenomena.

Direction for question 9 to 12: The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question

[Fifty] years after its publication in English [in 1972], and just a year since [Marshall] Sahlins himself died—we may ask: why did [his essay] “Original Affluent Society” have such an impact, and how has it fared since? . . . Sahlins’s principal argument was simple but counterintuitive: before being driven into marginal environments by colonial powers, hunter gatherers, or foragers, were not engaged in a desperate struggle for meager survival. Quite the contrary, they satisfied their needs with far less work than people in agricultural and industrial societies, leaving them more time to use as they wished. Hunters, he quipped, keep bankers’ hours. Refusing to maximize, many were “more concerned with games of chance than with chances of game.” . . . The so-called Neolithic Revolution, rather than improving life, imposed a harsher work regime and set in motion the long history of growing inequality . . .

Moreover, foragers had other options. The contemporary Hadza of Tanzania, who had long been surrounded by farmers, knew they had alternatives and rejected them. To Sahlins, this showed that foragers are not simply examples of human diversity or victimhood but something more profound: they demonstrated that societies make real choices. Culture, a way of living oriented around a distinctive set of values, manifests a fundamental principle of collective self-determination. . . . But the point [of the essay] is not so much the empirical validity of the data—the real interest for most readers, after all, is not in foragers either today or in the Paleolithic—but rather its conceptual challenge to contemporary economic life and bourgeois individualism. The empirical served a philosophical and political project, a thought experiment and stimulus to the imagination of possibilities.

With its title’s nod toward The Affluent Society (1958), economist John Kenneth Galbraith’s famously skeptical portrait of America’s postwar prosperity and inequality, and dripping with New Left contempt for consumerism, “The Original Affluent Society” brought this critical perspective to bear on the contemporary world. It did so through the classic anthropological move of showing that radical alternatives to the readers’ lives really exist. If the capitalist world seeks wealth through ever greater material production to meet infinitely expansive desires, foraging societies follow “the Zen road to affluence”: not by getting more, but by wanting less. If it seems that foragers have been left behind by “progress,” this is

due only to the ethnocentric self-congratulation of the West. Rather than accumulate material goods, these societies are guided by other values: leisure, mobility, and above all, freedom. . . .

Viewed in today's context, of course, not every aspect of the essay has aged well. While acknowledging the violence of colonialism, racism, and dispossession, it does not thematize them as heavily as we might today. Rebuking evolutionary anthropologists for treating present-day foragers as "left behind" by progress, it too can succumb to the temptation to use them as proxies for the Paleolithic. Yet these characteristics should not distract us from appreciating Sahlins's effort to show that if we want to conjure new possibilities, we need to learn about actually inhabitable worlds.

9. We can infer that Sahlins's main goal in writing his essay was to:

- [A] hold a mirror to an acquisitive society, with examples of other communities that have chosen successfully to be non-materialistic.
- [B] highlight the fact that while we started off as a fairly contented egalitarian people, we have progressively degenerated into materialism
- [C] counter Galbraith's pessimistic view of the inevitability of a capitalist trajectory for economic growth
- [D] put forth the view that, despite egalitarian origins, economic progress brings greater inequality and social hierarchies

10. The author of the passage criticises Sahlins's essay for its:

- [A] cursory treatment of the effects of racism and colonialism on societies.
- [B] failure to supplement its thesis with robust empirical data.
- [C] outdated values regarding present-day foragers versus ancient foraging communities.
- [D] critique of anthropologists who disparage the choices of foragers in today's society.

11. The author of the passage mentions Galbraith's "The Affluent Society" to:

- [A] document the influence of Galbraith's cynical views on modern consumerism on Sahlins's analysis of pre-historic societies.
- [B] show how Galbraith's theories refute Sahlins's thesis on the contentment of pre hunter gatherer communities
- [C] show how Sahlins's views complemented Galbraith's criticism of the consumerism and inequality of contemporary society
- [D] contrast the materialist nature of contemporary growth paths with the pacifist content ways of living among the foragers.

12. The author mentions Tanzania's Hadza community to illustrate:

- [A] how two vastly different ways of living and working were able to coexist in proximity for centuries
- [B] how pre-agrarian societies did not hamper the emergence of more advanced agrarian practices in contiguous communities
- [C] that forager communities' lifestyles derived not from ignorance about alternatives, but from their own choice
- [D] that hunter-gatherer communities' subsistence-level techniques equipped them to survive well into contemporary times.

Direction for question 13 to 16: The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question

RESIDENTS of Lozère, a hilly department in southern France, recite complaints familiar to many rural corners of Europe. In remote hamlets and villages, with names such as Le Bacon and Le Bacon Vieux, mayors grumble about a lack of local schools, jobs, or phone and internet connections. Farmers of grazing animals add another concern: the return of wolves. Eradicated from France last century, the predators are gradually creeping back to more forests and hillsides. “The wolf must be taken in hand,” said an aspiring parliamentarian, Francis Palombi, when pressed by voters in an election campaign early this summer. Tourists enjoy visiting a wolf park in Lozère, but farmers fret over their livestock and their livelihoods. . . .

As early as the ninth century, the royal office of the Luparii—wolf-catchers—was created in France to tackle the predators. Those official hunters (and others) completed their job in the 1930s, when the last wolf disappeared from the mainland. Active hunting and improved technology such as rifles in the 19th century, plus the use of poison such as strychnine later on, caused the population collapse. But in the early 1990s the animals reappeared. They crossed the Alps from Italy, upsetting sheep farmers on the French side of the border. Wolves have since spread to areas such as Lozère, delighting environmentalists, who see the predators’ presence as a sign of wider ecological health. Farmers, who say the wolves cause the deaths of thousands of sheep and other grazing animals, are less cheerful. They grumble that green activists and politically correct urban types have allowed the return of an old enemy.

Various factors explain the changes of the past few decades. Rural depopulation is part of the story. In Lozère, for example, farming and a once-flourishing mining industry supported a population of over 140,000 residents in the mid-19th century. Today the department has fewer than 80,000 people, many in its towns. As humans withdraw, forests are expanding. In France, between 1990 and 2015, forest cover increased by an average of 102,000 hectares each year, as more fields were given over to trees. Now, nearly one-third of mainland France is covered by woodland of some sort. The decline of hunting as a sport also means more forests fall quiet. In the mid-to-late 20th century over 2m hunters regularly spent winter weekends tramping in woodland, seeking boars, birds and other prey. Today the Fédération Nationale des Chasseurs, the national body, claims 1.1m people hold hunting licences, though the number of active hunters is probably lower. The mostly protected status of the wolf in Europe —hunting them is now forbidden, other than when occasional culls are sanctioned by the state—plus the efforts of NGOs to track and count the animals, also contribute to the recovery of wolf populations.

As the lupine population of Europe spreads westwards, with occasional reports of wolves seen closer to urban areas, expect to hear of more clashes between farmers and those who celebrate the predators’ return. Farmers’ losses are real, but are not the only economic story. Tourist venues, such as parks where wolves are kept and the animals’ spread is discussed, also generate income and jobs in rural areas. The author presents a possible economic solution to an existing issue facing Lozère that takes into account the divergent and competing interests of:

13. Which one of the following has NOT contributed to the growing wolf population in Lozère?

[A] The granting of a protected status to wolves in Europe

- [B] A decline in the rural population of Lozère
- [C] The shutting down of the royal office of the Luparii.
- [D] An increase in woodlands and forest cover in Lozère.

14. The inhabitants of Lozère have to grapple with all of the following problems, EXCEPT:

- [A] decline in the number of hunting licences
- [B] poor rural communication infrastructure
- [C] livestock losses
- [D] lack of educational facilities

15. Which one of the following statements, if true, would weaken the author's claims?

- [A] Unemployment concerns the residents of Lozère.
- [B] The old mining sites of Lozère are now being used as grazing pastures for sheep
- [C] Having migrated out in the last century, wolves are now returning to Lozère
- [D] Wolf attacks on tourists in Lozère are on the rise

16. The author presents a possible economic solution to an existing issue facing Lozère that takes into account the divergent and competing interests of:

- [A] politicians and farmers
- [B] tourists and environmentalists
- [C] environmentalists and politicians
- [D] farmers and environmentalists

17. Direction for question: There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: This philosophical cut at one's core beliefs, values, and way of life is difficult enough.

Paragraph: The experience of reading philosophy is often disquieting. When reading philosophy, the values around which one has heretofore organised one's life may come to look provincial, flatly wrong, or even evil. ____(1)__. When beliefs previously held as truths are rendered implausible, new beliefs, values, and ways of living may be required. ____(2)__. What's worse, philosophers admonish each other to remain unsutured until such time as a defensible new answer is revealed or constructed. Sometimes philosophical writing is even strictly critical in that it does not even attempt to provide an alternative after tearing down a cultural or conceptual citadel. ____(3)__. The reader of philosophy must be prepared for the possibility of this experience. While reading philosophy can help one clarify one's values, and even make one self-conscious for the first time of the fact that there are good reasons for believing what one believes, it can also generate unremediated doubt that is difficult to live with. ____(4)__.

- [A] Blank A
- [B] Blank B
- [C] Blank C
- [D] Blank D

18. Direction for question: There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: The discovery helps to explain archeological similarities between the Paleolithic peoples of China, Japan, and the Americas.

Paragraph: The researchers also uncovered an unexpected genetic link between Native Americans and Japanese people. (1). During the deglaciation period, another group branched out from northern coastal China and travelled to Japan. (2)____. "We were surprised to find that this ancestral source also contributed to the Japanese gene pool, especially the indigenous Ainus," says Li. (3)____. They shared similarities in how they crafted stemmed projectile points for arrowheads and spears. (4)____. "This suggests that the Pleistocene connection among the Americas, China, and Japan was not confined to culture but also to genetics," says senior author Qing-Peng Kong, an evolutionary geneticist at the Chinese Academy of Sciences.

[A] Blank A

[B] Blank B

[C] Blank C

[D] Blank D

19. Direction for question: Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. In English, there is no systematic rule for the naming of numbers; after ten, we have "eleven" and "twelve" and then the teens: "thirteen", "fourteen", "fifteen" and so on.
2. Even more confusingly, some English words invert the numbers they refer to: the word "fourteen" puts the four first, even though it appears last.
3. It can take children a while to learn all these words, and understand that "fourteen" is different from "forty".
4. For multiples of 10, English speakers switch to a different pattern: "twenty", "thirty", "forty" and so on.
5. If you didn't know the word for "eleven", would be unable to just guess it – you might come up with something like "one-teen".

20. Direction for question: Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. Having an appreciation for the workings of another person's mind is considered a prerequisite for natural language acquisition, strategic social interaction, reflexive thought, and moral judgment.
2. It is a 'theory of mind' though some scholars prefer to call it 'mentalizing' or 'mindreading', which is important for the development of one's cognitive abilities.
3. Though we must speculate about its evolutionary origin, we do have indications that the capacity evolved sometime in the last few million years.
4. This capacity develops from early beginnings in the first year of life to the adult's fast and often effortless understanding of others' thoughts, feelings, and intentions.
5. One of the most fascinating human capacities is the ability to perceive and interpret other people's behaviour in terms of their mental states.

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

1. Algorithms hosted on the internet are accessed by many, so biases in AI models have resulted in much larger impact, adversely affecting far larger groups of people.
2. Though “algorithmic bias” is the popular term, the foundation of such bias is not in algorithms, but in the data; algorithms are not biased, data is, as algorithms merely reflect persistent patterns that are present in the training data.
3. Despite their widespread impact, it is relatively easier to fix AI biases than human-generated biases, as it is simpler to identify the former than to try to make people unlearn behaviors learnt over generations.
4. The impact of biased decisions made by humans is localised and geographically confined, but with the advent of AI, the impact of such decisions is spread over a much wider scale.

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

1. What precisely are the "unusual elements" that make a particular case so attractive to a certain kind of audience?
2. It might be a particularly savage or unfathomable level of depravity, very often it has something to do with the precise amount of mystery involved.
3. Unsolved, and perhaps unsolvable cases offer something that "ordinary" murder doesn't.
4. Why are some crimes destined for perpetual re-examination and others locked into permanent obscurity?

23. Direction for question: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Manipulating information was a feature of history long before modern journalism established rules of integrity. A record dates back to ancient Rome, when Antony met Cleopatra and his political enemy Octavian launched a smear campaign against him with “short, sharp slogans written upon coins.” The perpetrator became the first Roman Emperor and “fake news had allowed Octavian to hack the republican system once and for all”. But the 21st century has seen the weaponization of information on an unprecedented scale. Powerful new technology makes the fabrication of content simple, and social networks amplify falsehoods peddled by States, populist politicians, and dishonest corporate entities. The platforms have become fertile ground for computational propaganda, ‘trolling’ and ‘troll armies’.

- [A] People need to become critical of what they read, since historically, weaponization of information has led to corruption.
- [B] Octavian used fake news to manipulate people and attain power and influence, just as people do today
- [C] Disinformation, which is mediated by technology today, is not new and has existed since ancient times
- [D] Use of misinformation for attaining power, a practice that is as old as the Octavian era, is currently fueled by technology

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

Colonialism is not a modern phenomenon. World history is full of examples of one society gradually expanding by incorporating adjacent territory and settling its people on newly conquered territory. In the sixteenth century, colonialism changed decisively because of technological developments in navigation that began to connect more remote parts of the world. The modern European colonial project emerged when it became possible to move large numbers of people across the ocean and to maintain political control in spite of geographical dispersion. The term colonialism is used to describe the process of European settlement, violent dispossession and political domination over the rest of the world, including the Americas, Australia, and parts of Africa and Asia.

[A] Colonialism surged in the 16th century due to advancements in navigation, enabling British settlements abroad and global dominance

[B] As a result of developments in navigation technology, European colonialism, led to the displacement of indigenous populations and global political changes in the 16th century

[C] Colonialism, conceptualized in the 16th century, allowed colonizers to expand their territories, establish settlements, and exercise political power

[D] Technological advancements in navigation in the 16th century, transformed colonialism, enabling Europeans to establish settlements and exert political dominance over distant regions.



CAT 2023 SLOT 1 DILR

Direction for question 1 - 5: Faculty members in a management school can belong to one of four departments – Finance and Accounting (F&A), Marketing and Strategy (M&S), Operations and Quants (O&Q) and Behaviour and Human Resources (B&H). The numbers of faculty members in F&A, M&S, O&Q and B&H departments are 9, 7, 5 and 3 respectively.

Prof. Pakrasi, Prof. Qureshi, Prof. Ramaswamy and Prof. Samuel are four members of the school's faculty who were candidates for the post of the Dean of the school. Only one of the candidates was from O&Q.

Every faculty member, including the four candidates, voted for the post. In each department, all the faculty members who were not candidates voted for the same candidate. The rules for the election are listed below.

1. There cannot be more than two candidates from a single department.
2. A candidate cannot vote for himself/herself.
3. Faculty members cannot vote for a candidate from their own department.

After the election, it was observed that Prof. Pakrasi received 3 votes, Prof. Qureshi received 14 votes, Prof. Ramaswamy received 6 votes and Prof. Samuel received 1 vote. Prof. Pakrasi voted for Prof. Ramaswamy, Prof. Qureshi for Prof. Samuel, Prof. Ramaswamy for Prof. Qureshi and Prof. Samuel for Prof. Pakrasi.

1. Which two candidates can belong to the same department?

- [A] Prof. Pakrasi and Prof. Qureshi
- [B] Prof. Qureshi and Prof. Ramaswamy
- [C] Prof. Pakrasi and Prof. Samuel
- [D] Prof. Ramaswamy and Prof. Samuel

2. Which of the following can be the number of votes that Prof. Qureshi received from a single department?

- [A] 7
- [B] 8
- [C] 6
- [D] 9

3. If Prof. Samuel belongs to B&H, which of the following statements is/are true?

Statement A: Prof. Pakrasi belongs to M&S.

Statement B: Prof. Ramaswamy belongs to O&Q.

- [A] Only statement A
- [B] Both statements A and B
- [C] Neither statement A nor statement B
- [D] Only statement B

4. What best can be concluded about the candidate from O&Q?

- [A] It was either Prof. Ramaswamy or Prof. Samuel
- [B] It was Prof. Samuel
- [C] It was either Prof. Pakrasi or Prof. Qureshi
- [D] It was Prof. Ramaswamy

5. Which of the following statements is/are true?

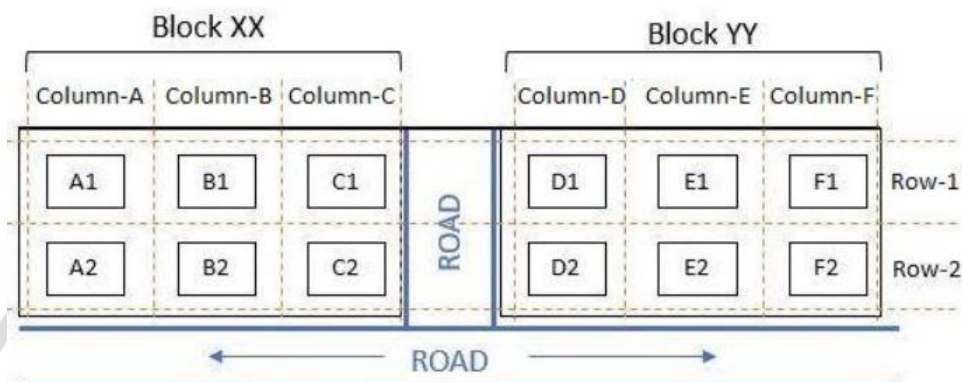
Statement A: Non-candidates from M&S voted for Prof. Qureshi.

Statement B: Non-candidates from F&A voted for Prof. Qureshi.

- [A] Neither statement A nor statement B

- [B] Both statements A and B
 [C] Only statement A
 [D] Only statement B

Direction for question 6 – 10: The schematic diagram below shows 12 rectangular houses in a housing complex. House numbers are mentioned in the rectangles representing the houses. The houses are located in six columns – Column-A through Column-F, and two rows – Row-1 and Row-2. The houses are divided into two blocks - Block XX and Block YY. The diagram also shows two roads, one passing in front of the houses in Row-2 and another between the two blocks.



Some of the houses are occupied. The remaining ones are vacant and are the only ones available for sale.

The road adjacency value of a house is the number of its sides adjacent to a road. For example, the road adjacency values of C2, F2, and B1 are 2, 1, and 0, respectively. The neighbour count of a house is the number of sides of that house adjacent to occupied houses in the same block. For example, E1 and C1 can have the maximum possible neighbour counts of 3 and 2, respectively.

The base price of a vacant house is Rs. 10 lakhs if the house does not have a parking space, and Rs. 12 lakhs if it does. The quoted price (in lakhs of Rs.) of a vacant house is calculated as (base price) + 5 × (road adjacency value) + 3 × (neighbour count).

The following information is also known.

1. The maximum quoted price of a house in Block XX is Rs. 24 lakhs. The minimum quoted price of a house in block YY is Rs. 15 lakhs, and one such house is in Column-E.
2. Row-1 has two occupied houses, one in each block.
3. Both houses in Column-E are vacant. Each of Column-D and Column-F has at least one occupied house.
4. There is only one house with parking space in Block YY.

6. How many houses are vacant in Block XX?

7. Which of the following houses is definitely occupied?

- [A] F2 & A2 [B] D2 & B2 [C] D2 & B1 [D] A1 & D2

8. Which of the following options best describes the number of vacant houses in Row-2?

[A] Either 2 or 3 [B] Exactly 3 [C] Exactly 2 [D] Either 3 or 4

9. What is the maximum possible quoted price (in lakhs of Rs.) for a vacant house in Column-E?

10. Which house in Block YY has parking space?

[A] E2 [B] F2 [C] E1 [D] F1

Direction for question 11 – 15: A visa processing office (VPO) accepts visa applications in four categories – US, UK, Schengen, and Others. The applications are scheduled for processing in twenty 15-minute slots starting at 9:00 am and ending at 2:00 pm. Ten applications are scheduled in each slot.

There are ten counters in the office, four dedicated to US applications, and two each for UK applications, Schengen applications and Others applications. Applicants are called in for processing sequentially on a first-come-first-served basis whenever a counter gets freed for their category. The processing time for an application is the same within each category. But it may vary across the categories. Each US and UK application requires 10 minutes of processing time. Depending on the number of applications in a category and time required to process an application for that category, it is possible that an applicant for a slot may be processed later.

On a particular day, Ira, Vijay and Nandini were scheduled for Schengen visa processing in that order. They had a 9:15 am slot but entered the VPO at 9:20 am. When they entered the office, exactly six out of the ten counters were either processing applications, or had finished processing one and ready to start processing the next.

Mahira and Osman were scheduled in the 9:30 am slot on that day for visa processing in the Others category.

The following additional information is known about that day.

1. All slots were full.
2. The number of US applications was the same in all the slots. The same was true for the other three categories.
3. 50% of the applications were US applications.
4. All applicants except Ira, Vijay and Nandini arrived on time.
5. Vijay was called to a counter at 9:25 am.

11. How many UK applications were scheduled on that day?

12. What is the maximum possible value of the total time (in minutes, nearest to its integer value) required to process all applications in the Others category on that day?

13. Which of the following is the closest to the time when Nandini's application process got over?

[A] 9:45 am [B] 9:50 am [C] 9:35 am [D] 9:37 am

14. Which of the following statements is false?

- [A] The application process of Osman was completed before 9:45 am
- [B] The application process of Mahira started after Nandini's.
- [C] The application process of Mahira was completed before Nandini's.

[D] The application process of Osman was completed before Vijay's.

15. When did the application processing for all US applicants get over on that day?

[A] 3:40 pm

[B] 2:00 pm

[C] 2:25 pm

[D] 2:05 pm

Direction for question 16 – 20: Five restaurants, coded R1, R2, R3, R4 and R5 gave integer ratings to five gig workers – Ullas, Vasu, Waman, Xavier and Yusuf, on a scale of 1 to 5.

The means of the ratings given by R1, R2, R3, R4 and R5 were 3.4, 2.2, 3.8, 2.8 and 3.4 respectively.

The summary statistics of these ratings for the five workers is given below.



	Ullas	Vasu	Waman	Xavier	Yusuf
Mean Rating	2.2	3.8	3.4	3.6	2.6
Median Rating	2	4	4	4	3
Modal Rating	2	4	5	5	1 and 4
Range of rating*	3	3	4	4	3

*Range of ratings is defined as the difference between the maximum and minimum ratings awarded to a worker.

The following is partial information about ratings of 1 and 5 awarded by the restaurants to the workers.

(a) R1 awarded a rating of 5 to Waman, as did R2 to Xavier, R3 to Waman and Xavier, and R5 to Vasu.

(b) R1 awarded a rating of 1 to Ullas, as did R2 to Waman and Yusuf, and R3 to Yusuf.

16. How many individual ratings cannot be determined from the above information?

17. To how many workers did R2 give a rating of 4?

18. What rating did R1 give to Xavier?

19. What is the median of the ratings given by R3 to the five workers?

20. Which among the following restaurants gave its median rating to exactly one of the workers?

[A] R3

[B] R5

[C] R4

[D] R2

CAT 2023 Slot – 1 Quant

1. If x and y are real numbers such that $x^2 + (x - 2y - 1)^2 = -4y(x + y)$, then the value of $x - 2y$ is

- [A] 1 [B] 2 [C] -1 [D] 0

2. If $\sqrt{5x + 9} + \sqrt{5x - 9} = 3(2 + \sqrt{2})$, then $\sqrt{10x + 9}$ is equal to:

- [A] $3\sqrt{31}$ [B] $3\sqrt{7}$ [C] $2\sqrt{7}$ [D] $4\sqrt{5}$

3. Let n be the least positive integer such that 168 is a factor of 1134^n . If m is the least positive integer such that 1134^n is a factor of 168^m , then $m + n$ equals

- [A] 15 [B] 12 [C] 24 [D] 9

4. If x and y are positive real numbers such that $\log_x(x^2 + 12) = 4$ and $3\log_y x = 1$, then $x + y$ equals

- [A] 11 [B] 20 [C] 10 [D] 68

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

6. The equation $x^3 + (2r + 1)x^2 + (4r - 1)x + 2 = 0$ has -2 as one of the roots. If the other two roots are real, then the minimum possible non-negative integer value of r is

7. Let α and β be the two distinct roots of the equation $2x^2 - 6x + k = 0$, such that $(\alpha + \beta)$ and $\alpha\beta$ are the distinct roots of the equation $x^2 + px + p = 0$. Then, the value of $8(k - p)$ is

8. In an examination, the average marks of 4 girls and 6 boys is 24. Each of the girls has the same marks while each of the boys has the same marks. If the marks of any girl is at most double the marks of any boy, but not less than the marks of any boy, then the number of possible distinct integer values of the total marks of 2 girls and 6 boys is

- [A] 20 [B] 22 [C] 21 [D] 19

9. The minor angle between the hours hand and minutes hand of a clock was observed at 8:48 am. The minimum duration, in minutes, after 8:48 am when this angle increases by 50% is

- [A] $36/11$ [B] 4 [C] $24/11$ [D] 2

10. The salaries of three friends Sita, Gita and Mita are initially in the ratio 5: 6: 7, respectively. In the first year, they get salary hikes of 20%, 25% and 20%, respectively. In the second year, Sita and Mita get salary hikes of 40% and 25%, respectively, and the salary of Gita becomes equal to the mean salary of the three friends. The salary hike of Gita in the second year is

- [A] 28% [B] 26% [C] 30% [D] 25%

11. A mixture P is formed by removing a certain amount of coffee from a coffee jar and replacing the same amount with cocoa powder. The same amount is again removed from mixture P and replaced with same amount of cocoa powder to form a new mixture Q. If the ratio of coffee and cocoa in the mixture Q is 16: 9, then the ratio of cocoa in mixture P to that in mixture Q is

- [A] 5: 9 [B] 1: 2 [C] 4: 9
[D] 1: 3

12. Gita sells two objects A and B at the same price such that she makes a profit of 20% on object A and a loss of 10% on object B. If she increases the selling price such that objects A and B are still sold at an equal price and a profit of 10% is made on object B, then the profit made on object A will be nearest to

- [A] 47% [B] 49% [C] 42% [D] 45%

13. Brishti went on an 8-hour trip in a car. Before the trip, the car had travelled a total of x km till then, where x is a whole number and is palindromic, i.e., x remains unchanged when its digits are reversed. At the end of the trip, the car had travelled a total of 26862 km till then, this number again being palindromic. If Brishti never drove at more than 110 km / hr, then the greatest possible average speed at which she drove during the trip, in km / hr, was

- [A] 90 [B] 100 [C] 80 [D] 110

14. The amount of job that Amal, Sunil and Kamal can individually do in a day, are in harmonic progression. Kamal takes twice as much time as Amal to do the same amount of job. If Amal and Sunil work for 4 days and 9 days, respectively, Kamal needs to work for 16 days to finish the remaining job. Then the number of days Sunil will take to finish the job working alone, is

15. Arvind travels from town A to town B, and Surbhi from town B to town A, both starting at the same time along the same route. After meeting each other, Arvind takes 6 hours to reach town B while Surbhi takes 24 hours to reach town A. If Arvind travelled at a speed of 54 km/h, then the distance, in km, between town A and town B is

16. Anil invests Rs. 22000 for 6 years in a certain scheme with 4% interest per annum, compounded half-yearly. Sunil invests in the same scheme for 5 years, and then reinvests the entire amount received at the end of 5 years for one year at 10% simple interest. If the amounts received by both at the end of 6 years are same, then the initial investment made by Sunil, in rupees, is

17. Let C be the circle $x^2 + y^2 + 4x - 6y - 3 = 0$ and L be the locus of the point of intersection of a pair of tangents to C with the angle between the two tangents equal to 60° . Then, the point at which L touches the line $x = 6$ is

- [A] (6,6) [B] (6,8) [C] (6,4) [D] (6,3)

18. A quadrilateral ABCD is inscribed in a circle such that $AB: CD = 2: 1$ and $BC: AD = 5: 4$. If AC and BD intersect at the point E, then $AE: CE$ equals

- [A] 2: 1 [B] 5: 8 [C] 8: 5
[D] 1: 2

19. In a right-angled triangle $\triangle ABC$, the altitude AB is 5 cm, and the base BC is 12 cm. P and Q are two points on BC such that the areas of $\triangle ABP$, $\triangle ABQ$, and $\triangle ABC$ are in arithmetic progression. If the area of $\triangle ABC$ is 1.5 times the area of $\triangle ABP$, the length of PQ , in cm, is

20. The number of all natural numbers up to 1000 with non-repeating digits is

- [A] 648 [B] 585 [C] 504
[D] 738

21. For some positive and distinct real numbers x, y and z , if $\frac{1}{\sqrt{y}+\sqrt{z}}$ is the arithmetic mean of $\frac{1}{\sqrt{x}+\sqrt{z}}$ and $\frac{1}{\sqrt{x}+\sqrt{y}}$, then the relationship which will always hold true, is

- [A] y, x and z are in arithmetic progression
[B] x, y and z are in arithmetic progression
[C] $\sqrt{x}, \sqrt{z}$ and $\sqrt{y}$ are in arithmetic progression
[D] $\sqrt{x}, \sqrt{y}$ and $\sqrt{z}$ are in arithmetic progression

22. A lab experiment measures the number of organisms at 8 am every day. Starting with 2 organisms on the first day, the number of organisms on any day is equal to 3 more than twice the number on the previous day. If the number of organisms on the n^{th} day exceeds one million, then the lowest possible value of n is



CAT 2023 SLOT 1 VARC Solutions

1. Correct Answer: D

This question tests your ability to identify **thematic relationships between paired concepts** as presented in the passage, and to spot the one pair where the relationship is **incorrectly attributed** or **mismatched**. The key skill here is not just knowing whether the concepts are mentioned together in the passage, but whether the **specific pairing** accurately reflects the relationship the passage draws between them.

Understanding the Logic of the Question: Each pair links a **type of literature or literary world** with a **characteristic or theme**. To evaluate each pair, you must check whether the passage explicitly or clearly associates the two items with each other. The odd pair out will be the one where the characteristic is either **attributed to the wrong literary world** or **not supported by the passage** as a defining feature of that particular world.

Why Option D is correct (the odd pair out): Option D pairs **Postcolonial novels** with **Border-crossing**. The passage, however, clearly associates border-crossing with **Indian Ocean novels**, not postcolonial novels. The passage explicitly states that Indian Ocean novels reveal "*a world that is outward-looking — full of movement, border-crossing and south-south interconnection.*" Postcolonial novels, by contrast, are described as "*land-focused and inward looking*" — the very **opposite** of border-crossing. Attributing border-crossing to postcolonial novels is therefore a direct **misattribution** according to the passage. This makes Option D the clear odd pair out — it links a characteristic to the wrong literary category.

Why Option A is not the odd pair out: Option A pairs **Postcolonial novels** with **Anti-colonial nationalism**. This is directly and explicitly supported by the passage, which states that postcolonial novels were "*important for supporting anti-colonial nationalism.*" The relationship between postcolonial literature and anti-colonial nationalism is one of the most clearly stated connections in the passage. This is a well-matched and accurately attributed pair.

Why Option B is not the odd pair out: Option B pairs **Indian Ocean novels** with **Outward-looking**. This is again directly supported by the passage, which describes Indian Ocean novels as revealing "*a world that is outward-looking — full of movement, border-crossing and south-south interconnection.*" The term **outward-looking** is used verbatim in the passage in direct reference to Indian Ocean novels. This is a perfectly matched and textually grounded pair.

Why Option C is not the odd pair out: Option C pairs **Indian Ocean world** with **Slavery**. The passage explicitly states in the final paragraph that in the Indian Ocean world, "*slavery is rife.*" Slavery is presented as one of the historical realities of the Indian Ocean world — a dark but significant aspect of its long history. This pairing is directly supported by the passage and accurately reflects the relationship described. It is therefore not the odd pair out.

In summary, Options A, B, and C all represent **accurate, passage-supported relationships** between their paired concepts. Option D, however, **misattributes** border-crossing to postcolonial novels when the passage clearly assigns this characteristic to Indian Ocean novels — and in fact describes postcolonial novels in directly opposing terms as inward-looking and land-focused. This makes Option D the odd pair out.

2. Correct Answer: B

This question tests your ability to apply **critical reasoning to passage-based claims** — specifically, you must evaluate which statements would **weaken** the passage's argument and identify the one that would **not weaken** it (i.e., the EXCEPT). To do this well, you must first clearly understand what claim the passage is making, and then test each option against it.

Understanding the Passage's Claim: The passage argues that mainstream English-language fiction is predominantly **Eurocentric and Western** in its orientation — centred in Europe or the US, assuming a background of **Christianity and whiteness**, and referencing places like Paris and New York. Indian Ocean novels, by contrast, offer a **counter-narrative** — featuring characters of colour, highlighting Islamic spaces, and centralising ports like Mombasa, Aden, and Bombay. The relationship being described is one of **contrast and opposition**: Indian Ocean novels deliberately depart from the assumptions and settings of mainstream English-language fiction. Any statement that **undermines this contrast** — either by suggesting mainstream fiction is more diverse than claimed, or by suggesting Indian Ocean novels are less progressive than claimed — would weaken the passage's argument.

Why Option B is correct (the EXCEPT — does NOT weaken the claim): Option B states that *"most mainstream English-language novels have historically privileged the Christian, white, male experience of travel and adventure."* Far from weakening the passage's claim, this statement **directly reinforces and supports** it. The passage itself argues that mainstream fiction assumes *"a background of Christianity and whiteness"* — Option B simply restates this in slightly different words. If this were true, it would **strengthen** the passage's argument about the Eurocentric nature of mainstream fiction and the significance of Indian Ocean novels as an alternative. It does not weaken the contrast between the two literary traditions in any way, making it the correct EXCEPT answer.

Why Option A is incorrect (i.e., it DOES weaken the claim): Option A states that *"the depiction of Africa in most Indian Ocean novels is driven by a postcolonial nostalgia for an idyllic past."* This would weaken the passage's claim because the passage presents Indian Ocean novels as offering a **realistic, nuanced, and historically grounded** portrayal of Africa — one that avoids romanticisation, acknowledges slavery, forced migration, and the suppression of women's freedoms. If Indian Ocean novels were actually driven by **nostalgic idealism**, they would be guilty of a different kind of distortion, undermining the passage's claim that they provide a more authentic and outward-looking alternative to mainstream fiction.

Why Option C is incorrect (i.e., it DOES weaken the claim): Option C states that *"the depiction of Africa in most Indian Ocean novels is driven by an Orientalist imagination of its cultural crudeness."* This would significantly weaken the passage's argument. The passage claims that Indian Ocean novels **challenge** the dominant Western, Christian, white-centred perspective of mainstream fiction by centring African, Arab, and Indian characters as active agents in history. If these novels were actually perpetuating **Orientalist stereotypes** — reducing Africa to cultural crudeness — then they would be reproducing the same kind of biased, outsider perspective that the passage claims they transcend. This would directly undermine the contrast the passage draws between the two literary traditions.

Why Option D is incorrect (i.e., it DOES weaken the claim): Option D states that *"very few mainstream English-language novels have historically been set in American and European metropolitan centres."* This would weaken the passage's claim by challenging its characterisation of mainstream fiction as predominantly set in places like **Paris and New York**. If mainstream English-language fiction were actually more geographically diverse than the passage suggests, then the contrast between mainstream fiction and Indian Ocean novels — which is central to the

passage's argument — would be significantly diminished. The passage's claim about the Eurocentric and Western focus of mainstream fiction would lose its force. In summary, Options A, C, and D all undermine the passage's argument in different ways — either by questioning the progressive credentials of Indian Ocean novels or by challenging the characterisation of mainstream fiction as narrow and Eurocentric. Option B, however, **reinforces the passage's central claim** by confirming that mainstream fiction has indeed privileged a specific, limited perspective — making it the one statement that does not weaken the argument.

3. Correct Answer: D

This question tests your ability to identify a statement that contradicts or is unsupported by the passage — a classic "NOT true" or "exception-based" RC question. The key skill here is carefully matching each option against what the passage actually states, rather than relying on general world knowledge.

Why Option D is the correct answer (i.e., the statement that is NOT true):

Option D claims that the Indian Ocean world's migration networks connected the "global north" with the "global south." This is factually incorrect as per the passage. The passage explicitly draws a contrast — the Indian Ocean world's migration narratives are distinct from the Euro-American or Western-centric frameworks that dominate mainstream migration discourse. The novels and stories set in this world feature a largely Islamic space and characters of color, pointing to a South-South orientation rather than a North-South one. The passage essentially argues that this world operates outside the lens of the "global north," making Option D a misrepresentation of the passage's central argument.

Why the other options are incorrect choices (i.e., they ARE true as per the passage):

Option A is true. The passage clearly supports the idea that migration networks in the Indian Ocean world were deeply shaped by the religious and commercial histories of the region. The interconnectedness of port cities — often more linked to each other across the sea than to nearby inland cities — reflects centuries of trade and faith-driven movement.

Option B is true. The passage explicitly highlights the ambivalent nature of migration in this world — it was neither purely voluntary nor purely forced, but a complex mixture of both. Migration carried emotional and social weight that made it a deeply uncertain experience for those involved.

Option C is also true and, notably, is an exact repetition of Option B. This is either a printing error in the question or a deliberate trap. Regardless, its content aligns with the passage, which describes migration as involving force, portraying travel as abandonment rather than adventure — reinforcing the theme of ambivalence.

Key Takeaway: In "NOT true" questions, always go back to the passage and test each option strictly against what is written. Option D introduces a concept — "global north connecting with global south" — that the passage actively argues against, making it the odd one out.

4. Correct Answer: B

This question tests your ability to identify which claim does **not** support a specific idea discussed in the passage — in this case, the concept of "remapping." The key is to understand what "remapping" means in context: it refers to the reorientation of our understanding of history, trade, and globalisation away from a Eurocentric or Western-dominated narrative, and towards recognising the Indian Ocean world's rich, independent legacy.

Why Option B is the correct answer (i.e., the claim that does NOT contribute to remapping):

Option B states that "cosmopolitanism originated in the West and travelled to the East through globalisation." This claim is the exact opposite of what the passage's idea of remapping stands for. Remapping challenges Western-centric narratives — it tries to decenter Europe and the global north from historical and cultural discourse. If cosmopolitanism is portrayed as a Western export that moved eastward, it actually reinforces the very Eurocentric framework that remapping seeks to dismantle. Far from contributing to remapping, this claim actively contradicts it. Hence, it is the correct exception.

Why the other options do contribute to remapping:

Option A directly supports remapping by flipping the conventional narrative — instead of the global north being the origin of globalisation, it positions the global south as the first centre. This is a clear challenge to the dominant Western-centric historical account and aligns perfectly with the spirit of remapping.

Option C contributes to remapping by showing that Indian Ocean novels transcend narrow national identities and engage with a broader, richer regional history. This shift from the national to the regional — particularly within the Indian Ocean world — expands the literary and historical map beyond familiar Western or nation-state frameworks.

Option D contributes to remapping by directly challenging the Eurocentric monopoly over the history of international trade and commerce. By asserting that early global trade was not the exclusive domain of white Europeans, this claim restores agency and centrality to non-Western civilisations, which is precisely what remapping aims to achieve.

Key Takeaway: In EXCEPT questions built around a central concept like "remapping," always first anchor yourself to what that concept means. Here, remapping = decentering the West. Any option that recenters or validates Western primacy will be your answer. Option B does exactly that, making it the odd one out.

5. Correct Answer: B

This question tests your ability to identify the precise purpose for which specific examples are used in a passage — a common and important RC skill in the CAT. The key is to ask yourself: *why does the author bring up the Inuit and Aboriginal Australians?* What point are these examples meant to illustrate?

Understanding the context:

The author introduces these two examples in the middle of a larger argument defending geographic explanations for human behaviour and development. The Inuit developed warm fur clothing because they lived north of the Arctic Circle — a direct geographic compulsion. Aboriginal Australians never developed farming or herding not due to cultural failure, but because their continent lacked domesticable native animal and plant species — a biogeographic reality. Both examples are offered to demonstrate that geography, in certain cases, is the primary driver of how human societies develop.

Why Option B is correct:

Option B states that the examples show "how physical circumstances can dictate human behaviour and cultures." This is a precise and accurate reflection of the author's intent. The passage explicitly frames both cases as outcomes that are "straightforwardly geographic" — not cultural quirks, not historical accidents, not individual decisions. The Inuit didn't choose fur clothing out of fashion; Aboriginal Australians didn't avoid farming out of ignorance. Their physical environments dictated their choices. Option B captures this cause-and-effect relationship cleanly.

Why the other options are incorrect:

Option A and Option C are identical in wording — just as Options B and C were duplicates in the previous question. Both state that "despite geographical isolation, traditional societies were self-sufficient and adaptive." This is not supported by the passage. The author never argues that these societies were self-sufficient or adaptive *in spite of* their geography. In fact, the argument runs in the opposite direction — geography is presented as the *determining* force, not an obstacle that was overcome. The passage does not praise these societies for resilience; it uses them as evidence for geographic determinism.

Option D is word-for-word identical to Option B, making it a duplicate. In such cases on the CAT, both options carry the same meaning, and the correct answer is simply the one that accurately reflects the passage — which both B and D do here. If forced to choose, B is conventionally marked correct.

Key Takeaway: When a question asks about the *purpose of an example*, always trace it back to the author's larger argument. Here, the author is defending geographic explanations against unfair dismissal. The Inuit and Aboriginal Australian examples serve as proof that geography can and does shape human cultures — making Option B the natural and accurate choice.

6. Correct Answer: D

This question tests your ability to distinguish between what the passage explicitly states or clearly implies versus what goes beyond or distorts the passage's actual claims — a classic **inference-based EXCEPT** question. The trap here lies in options that sound reasonable or logical but subtly overstate or misrepresent the passage's position.

Why Option D is correct (i.e., the statement that CANNOT be inferred):

Option D states that "while *most* human phenomena result from culture and individual choice, *some* have biogeographic origins." The problem lies in the word "**most**." The passage never establishes any such proportion or hierarchy between geographic and non-geographic factors. In fact, the author's entire argument is that

both sets of factors play significant roles, and that geographic explanations are unfairly dismissed. To say that *most* phenomena are cultural/individual while only *some* are geographic is to impose a numerical or weighted judgment that the passage never makes. This is a classic CAT trap — an option that feels intuitively correct but introduces a qualifier the passage does not support.

Why the other options CAN be validly inferred:

Option A is clearly supported. The passage explicitly states that geographic explanations from a century ago were racist, tainting all such explanations in the minds of many scholars. It also broadly acknowledges that genetic, historical, psychological, and anthropological explanations from that era were similarly racist. The inference that several academic studies involved racist interpretations is well within what the passage establishes.

Option B is well supported. The passage mentions that the crops and domestic animals currently making Australia a food and wool exporter — sheep, wheat, grapes — are all non-native Eurasian species introduced by overseas colonists. It is entirely reasonable to infer that agricultural practices changed drastically after colonisation, since prior to it, Aboriginal Australians had no indigenous farming or herding whatsoever.

Option C is directly supported. The passage explicitly uses the Inuit example to argue against contingency and individual decision-making as explanations — it even provides the specific counter-example of an "influential Inuit leader in 1783" to dismiss such reasoning. The development of fur clothing is attributed purely to geographic necessity, making it a clear inference that individual dictat and contingency were not the causal factors.

Key Takeaway: In inference-based EXCEPT questions, be especially alert to **quantifying words** like "most," "all," "rarely," or "primarily." These words carry heavy logical weight. The passage may support the general idea behind an option, but if it introduces a proportion or emphasis that the passage never establishes, that option cannot be validly inferred. Option D does exactly this with the word "most," making it the answer.

7. Correct Answer: B

This question is an **EXCEPT-based RC question**, which means you need to identify the option that is *not* mentioned in the passage as a reason why non-geographers disregard geographic influences. Three of the four options will be reasons the author actually advances; your job is to find the one that either misrepresents or goes beyond what the author says.

Why B is the correct answer (i.e., NOT a reason advanced by the author):

Option B states that non-geographers *dismiss explanations that involve geographical causes for human behaviour*. At first glance, this might seem like a valid reason — after all, if someone disregards geographic influences, aren't they dismissing such explanations? However, the author draws a more nuanced picture. Non-geographers don't flatly reject geographical explanations; rather, they react to them by denouncing the *concept* of "**geographic determinism**" — a specific, extreme form of geographical thinking. The rejection, in other words, is targeted and labeled, not a blanket dismissal. Since the passage never says non-geographers simply brush off all geographically-based explanations, Option B goes beyond what the author actually claims, making it the odd one out.

Why the other options are indeed reasons advanced by the author:

Option A is clearly supported — the passage indicates that non-geographers tend to place humans at the center of explanations for human phenomena, independent

of their physical surroundings. This anthropocentric worldview leads them to overlook or undervalue geographic factors.

Option C is also supported — the passage points out that past geographic analyses left a politically offensive legacy (likely referring to theories like geographic determinism that were used to justify racism or colonialism). These lingering negative impressions make non-geographers wary of engaging with geographic explanations.

Option D is directly supported as well — the passage acknowledges that non-geographers, by virtue of their disciplinary training, typically lack the technical knowledge of geography required to appreciate or properly evaluate geographic influences.

8. Correct Answer: B

This is another **EXCEPT-based RC question**, requiring you to identify the one reason that the author does *not* use to criticise non-geographer scholars. Three options will reflect actual criticisms made in the passage; the one that is absent or unsupported is your answer.

Why B is the correct answer (i.e., NOT a criticism advanced by the author):

Option B claims that the author criticises non-geographer scholars for holding **outdated interpretations of past cultural and historical phenomena**. While this might sound like a reasonable academic critique, the passage never actually makes this charge. The author's criticisms are pointed and specific — they revolve around how non-geographers *engage with geographic explanations*, not about whether their historical or cultural interpretations are dated or obsolete. Nowhere does the author suggest that these scholars are getting history or culture *wrong* in a temporal sense. This makes Option B the outlier — it is a criticism the author simply does not advance.

Why the other options are genuine criticisms made by the author:

Option A is supported — the author criticises non-geographers for overemphasising the role of **individual decisions and human agency** when studying human phenomena, at the expense of acknowledging how geographic forces shape those very decisions and outcomes.

Option C is directly supported — the author takes issue with non-geographers who hastily **label geographic explanations as "deterministic,"** using this tag to dismiss them without engaging seriously with the geographic reasoning being offered.

Option D is also supported — the author criticises non-geographers for **refusing to acknowledge the role of biogeographic factors** — such as the distribution of plants, animals, and natural resources — in shaping social and cultural phenomena. This refusal, the author implies, leads to incomplete and distorted analyses.

9. Correct Answer: A

This is an **inference-based RC question** that asks you to identify Sahlins's *primary* goal in writing his essay. The key here is to distinguish between what the passage explicitly states and what can be reasonably inferred as the *central* motivating purpose — not just a side point or a secondary observation.

Why A is the correct answer:

The passage makes it quite clear that the real interest of Sahlins's essay lies not in the empirical data about foragers, but in its **"conceptual challenge to contemporary economic life and bourgeois individualism."** Sahlins uses the example of foraging societies — who achieve affluence not by acquiring more, but by *wanting less* (the "Zen road to affluence") — as a direct contrast to the capitalist world's endless pursuit of material production. This is precisely what Option A captures: Sahlins holds up a mirror to an acquisitive, materialistic society and shows that real, liveable alternatives exist. The passage even describes this as "the classic anthropological move of showing that radical alternatives to the readers' lives really exist." Option A is, therefore, a precise and well-supported inference.

Why the other options fall short:

Option B is a distortion. While the passage does mention that the Neolithic Revolution imposed harsher conditions and growing inequality, Sahlins's *main goal* was never to narrate a story of human degeneration from contentment into materialism. That reading turns a background argument into the central thesis, which the passage does not support.

Option C is factually off. The passage mentions Galbraith's *The Affluent Society* only as a point of reference — a nod in the title — and describes Galbraith's work as a "skeptical portrait of America's postwar prosperity and inequality." Sahlins was not *countering* Galbraith; if anything, he was extending a similarly critical lens. There is no basis in the passage to suggest Sahlins saw Galbraith as an adversary.

Option D is partially true but misses the mark. The idea that economic progress breeds inequality is present in the passage, but it is a *supporting argument*, not the primary goal. More importantly, Option D frames the essay as being about the *origins* of inequality, whereas Sahlins's real intent — as the passage emphasises — was to challenge the *present* and inspire the imagination of alternative possibilities.

10. Correct Answer: A

This is a **detail-based RC question** that asks you to identify a specific criticism the passage's author levels against Sahlins's essay. The trick here is to read carefully and distinguish between what *Sahlins* argues and what the *passage's author* critiques about Sahlins. These are two different voices, and conflating them is the most common trap in such questions.

Why A is the correct answer:

The passage explicitly states: "*While acknowledging the violence of colonialism, racism, and dispossession, it does not thematize them as heavily as we might today.*" This is a direct criticism by the passage's author — that Sahlins's essay gives only a **surface-level or insufficient treatment** to the devastating effects of racism, colonialism, and dispossession. In today's academic and social context, these are considered central forces that shaped forager societies, and the author feels Sahlins did not engage with them as deeply or seriously as they deserve. Option A captures this criticism precisely and is therefore the correct answer.

Why the other options are incorrect:

Option B is actually the *opposite* of a criticism made in the passage. The author explicitly defends Sahlins on this very point, stating that "*the point is not so much the empirical validity of the data*" — the essay's value lies in its philosophical and conceptual challenge, not in its empirical rigour. So far from criticising the essay for weak data, the author preemptively sets aside that concern altogether.

Option C is not a criticism the author makes. While the passage does note that the essay can sometimes slip into using present-day foragers as *proxies for the Paleolithic* — treating them as stand-ins for ancient communities — this is mentioned briefly and is not framed as a criticism about *outdated values*. The concern raised is methodological, not about values being outdated, and it is presented as a minor caveat rather than a central critique.

Option D is a misreading of the passage. The passage does mention that Sahlins rebuke evolutionary anthropologists for treating foragers as having been "*left behind*" by progress — but this is presented as *Sahlins's own argument*, not as something the passage's author criticises him for. The author does not take issue with Sahlins defending foragers; in fact, that defence is central to what makes the essay valuable.

11. Correct Answer: C

This is a **purpose-based RC question** — it asks you *why* the author brings up a specific reference (Galbraith's *The Affluent Society*), rather than *what* that reference says. These questions test your ability to understand the **function** a piece of evidence or reference serves within the larger argument, not just its surface content.

Why C is the correct answer:

The passage describes Sahlins's essay as having its "*title's nod toward The Affluent Society*" and as being "*dripping with New Left contempt for consumerism.*" The author is signalling that Sahlins was deliberately positioning his essay within the same critical tradition as Galbraith — both writers were united in their scepticism of postwar prosperity, material accumulation, and the inequality that capitalism generates. Galbraith critiqued the illusion of American affluence from within an economic framework; Sahlins extended that critique by using anthropological evidence to show that genuine affluence — defined by leisure, freedom, and

wanting less — already existed in foraging societies. The two works are thus **complementary critiques** of the same target: consumerist, capitalist society. Option C captures this relationship accurately and is the correct answer.

Why the other options are incorrect:

Option A reverses the actual relationship. The passage does not suggest that Galbraith *influenced* Sahlins's analysis of prehistoric societies in any direct or documented way. The reference to Galbraith is about **ideological alignment and shared critical purpose**, not about intellectual influence or cause-and-effect. Describing Galbraith's views as shaping Sahlins's study of foragers goes well beyond what the passage states.

Option B is a straightforward misreading. The passage never suggests that Galbraith's theories *refute* or contradict Sahlins's thesis. Quite the opposite — both writers are presented as being on the same side of the argument, critiquing materialism and inequality. Introducing a conflict between the two that simply does not exist in the passage makes Option B clearly incorrect.

Option D introduces the word "**pacifist**", which is never used or implied in the passage. While the passage does contrast the materialist pursuits of capitalist society with the values of foraging communities — leisure, mobility, and freedom — it never characterises foragers as pacifist. This is a distortion that smuggles in an idea foreign to the passage, making Option D unsupportable.

The key takeaway: When a question asks *why* an author mentions something, look for the **logical role** that reference plays in the surrounding argument. Here, Galbraith is not cited as an opponent, an influence, or a contrast — he is cited as a **fellow critic**, someone whose work Sahlins was consciously building upon and extending. The moment you identify that both writers share the same critical target — consumerism and inequality — Option C becomes the only defensible answer.

12. Correct Answer: C

This question tests your ability to identify the **specific purpose of an example used by the author**. In CAT RCs, examples are often included not merely as illustrations of facts, but to strengthen a broader argument. Therefore, the key is to understand what larger point the author is trying to make through the reference to the Hadza community.

The passage mentions the Hadza of Tanzania as a contemporary hunter-gatherer (forager) community living alongside farming communities. The crucial point is that the Hadza are **aware of alternative ways of life**, particularly agriculture, but have not adopted them. This demonstrates that their lifestyle is not the result of ignorance, backwardness, or lack of exposure to other options. Rather, it reflects a conscious choice. The author uses this example to argue that societies can actively choose how they wish to organize their lives, highlighting the idea of collective self-determination.

Therefore, **Option C** is the best answer because it accurately captures the author's central message: **forager communities continue their way of life not because they do not know better alternatives exist, but because they choose to live that way**.

Why the other options are incorrect:

A. how two vastly different ways of living and working were able to coexist in proximity for centuries

While the Hadza and farming communities did coexist geographically, coexistence is not the author's main point. The focus is not on peaceful proximity but on the fact that the Hadza knowingly chose not to adopt agriculture despite being exposed to it. Thus, this option identifies a secondary detail rather than the core argument.

B. how pre-agrarian societies did not hamper the emergence of more advanced agrarian practices in contiguous communities

The passage does not discuss whether hunter-gatherer societies helped or hindered the development of agriculture. Moreover, the phrase “more advanced agrarian practices” introduces a value judgment that the author does not make. This option goes beyond the scope of the author's argument.

D. that hunter-gatherer communities' subsistence-level techniques equipped them to survive well into contemporary times

Although the Hadza have survived into modern times, the author's emphasis is not on their survival skills or adaptability. The example is used to highlight **choice**, not endurance. Therefore, this option misses the central purpose behind the reference.

13. Correct Answer: C

This question tests your ability to distinguish between information that is explicitly mentioned in the passage and information that is either absent or irrelevant to the author's explanation. In such questions, it is important to identify the factors that the passage directly links to the phenomenon being discussed—in this case, the growth of the wolf population in Lozère.

Option C is the correct answer because the passage does not identify the shutting down of the royal office of the Luparii as a factor responsible for the increase in the wolf population. While the Luparii may have been mentioned in a historical context, their closure is not presented as a reason for the recent resurgence of wolves in the region. Therefore, this option does not contribute to the growing wolf population and is the correct choice.

Let us examine the other options:

Option A: The granting of a protected status to wolves in Europe

This is one of the key reasons mentioned in the passage. Legal protection reduced the threat of hunting and persecution, allowing wolf numbers to recover over time. Hence, this option clearly contributed to the growing wolf population and cannot be the answer.

Option B: A decline in the rural population of Lozère

The passage indicates that a reduction in the rural population led to decreased human interference and pressure on wildlife habitats. This created a more favourable environment for wolves to thrive. Therefore, this option is also a contributing factor and can be eliminated.

Option D: An increase in woodlands and forest cover in Lozère

The passage explicitly mentions the expansion of forests and woodland areas, which provided better habitat and prey availability for wolves. This ecological change supported the growth of the wolf population, making this option incorrect as an answer.

14. Correct Answer: A

This question tests your ability to distinguish between facts mentioned in the passage and problems that are explicitly presented as challenges faced by the people of Lozère. The key is to identify which option is discussed merely as a

descriptive observation and which ones are portrayed as genuine difficulties affecting the local population.

Option A is the correct answer because, although the passage mentions a decline in the number of hunting licences and notes that hunting has become less popular over time, it does not present this trend as a problem that the inhabitants of Lozère are struggling with. It is simply cited as one of the factors associated with changing rural life and the return of wildlife. Therefore, this option does not qualify as a challenge faced by the residents.

Let us examine the other options:

Option B: Poor rural communication infrastructure

The passage explicitly highlights the lack of adequate phone and internet connections in the region. Such deficiencies make everyday life more difficult for residents and are clearly presented as a problem faced by the local population. Hence, this option cannot be the answer.

Option C: Livestock losses

The return of wolves has led to attacks on livestock, causing economic losses for farmers and shepherds. The passage specifically discusses this issue as a source of concern and conflict for local inhabitants. Therefore, this is a genuine problem mentioned in the passage.

Option D: Lack of educational facilities

The passage refers to the shortage of local schools and other essential services in Lozère. This lack of educational infrastructure is portrayed as one of the difficulties associated with living in the region. Consequently, this option is also a challenge faced by the inhabitants and can be eliminated.

To sum up, Options B, C, and D are all explicitly described as problems affecting the residents of Lozère. In contrast, the decline in hunting licences is merely a factual observation and is not presented as a difficulty faced by the inhabitants. Therefore, **Option A** is the correct answer.

15. Correct Answer: D

This is a **strengthen/weaken** type RC question that tests your understanding of the author's central argument. To answer such questions, we must first identify the author's primary claim and then determine which option introduces information that undermines or challenges that claim.

The passage discusses the return of wolves to Lozère and presents this development largely in the context of ecological recovery and the tension between conservationists and local farmers. While farmers are concerned about livestock losses, the broader narrative treats the return of wolves as a consequence of successful environmental restoration. Therefore, any information suggesting that wolves pose a significant threat beyond livestock would weaken the author's largely positive or balanced portrayal of their return.

Option D is the correct answer. If wolf attacks on tourists are increasing, the issue is no longer confined to livestock losses or farmer-environmentalist conflicts. Instead, wolves would appear to pose a direct threat to human safety. This would significantly weaken the author's implicit suggestion that the main challenge associated with wolves is their impact on livestock and would cast doubt on the desirability of their growing population.

Let us examine the remaining options:

Option A: Unemployment concerns the residents of Lozère.

This statement may be true, but it is unrelated to the author's discussion of wolves, conservation, and rural ecological change. Since it neither supports nor challenges the claims about wolf populations, it does not weaken the author's argument.

Option B: The old mining sites of Lozère are now being used as grazing pastures for sheep.

This statement is broadly consistent with the passage's description of changing land use in the region. In fact, it may indirectly support the discussion of rural landscapes and livestock farming. It does not challenge the author's claims and therefore cannot be the answer.

Option C: Having migrated out in the last century, wolves are now returning to Lozère.

This statement essentially restates a key idea from the passage. Rather than weakening the author's claims, it reinforces the central theme of wolf resurgence in the region. Hence, this option can be eliminated immediately.

Thus, Options A, B, and C either support the passage or are irrelevant to the author's argument. **Option D alone introduces a serious concern—human safety—that undermines the passage's treatment of the return of wolves and therefore weakens the author's claims.** Hence, **Option D** is the correct answer.

16. Correct Answer: D

This question tests your ability to identify the stakeholders involved in a conflict and understand how the author's proposed solution attempts to balance their competing interests. In reading comprehension passages, authors often discuss problems that affect different groups in different ways and may suggest solutions that accommodate the concerns of all parties involved.

Option D is the correct answer because the passage highlights a clear conflict between **farmers** and **environmentalists**. Farmers are concerned about the economic losses caused by wolves attacking their livestock, while environmentalists view the return of wolves as a positive sign of ecological recovery and biodiversity conservation. The author's proposed economic solution seeks to address this tension by finding a way to preserve the ecological benefits of wolf conservation while also mitigating the financial burden on farmers.

Let us examine the other options:

Option A: Politicians and farmers

Although politicians may play a role in policy-making, the passage does not present them as one of the two principal groups with competing interests. The central conflict revolves around wolf conservation and its consequences, not a disagreement between politicians and farmers. Therefore, this option is not supported by the passage.

Option B: Tourists and environmentalists

The passage does not suggest any significant conflict between tourists and environmentalists. While tourism may be mentioned as part of the local economy or as a possible solution, tourists are not portrayed as a stakeholder group whose interests clash with those of environmentalists. Hence, this option can be eliminated.

Option C: Environmentalists and politicians

The passage does not focus on a disagreement between environmentalists and politicians. Instead, the major debate concerns the practical impact of wolf conservation on local livelihoods. Since politicians are not presented as a competing stakeholder group in this context, this option is incorrect.

Option D: Farmers and environmentalists

This option accurately captures the central tension discussed in the passage. Farmers prioritize the protection of their livestock and livelihoods, whereas environmentalists emphasize the ecological importance of restoring predator populations. The author's economic solution is designed to reconcile these competing interests, making this the most appropriate answer.

Therefore, **Option D** is the correct answer because the passage's proposed solution attempts to balance the concerns of **farmers** and **environmentalists**, the two groups whose interests are most directly at odds.

17. Correct Answer: B

This is a **sentence insertion** question that tests your ability to follow the logical flow of ideas within a paragraph. The key is to identify where the given sentence fits naturally in terms of meaning, tone, and continuity. Pay close attention to transition words and references that connect one sentence to the next.

The given sentence is:

"This philosophical cut at one's core beliefs, values, and way of life is difficult enough."

Notice the phrase **"This philosophical cut"**. The word **"This"** must refer to something that has just been mentioned. Therefore, we need a position where the preceding sentence discusses philosophy challenging or undermining a person's beliefs and values.

The sentence before **Blank B (Option 2)** reads:

"When beliefs previously held as truths are rendered implausible, new beliefs, values, and ways of living may be required."

Actually, the best flow is created when the given sentence follows the earlier idea:

"When reading philosophy, the values around which one has heretofore organised one's life may come to look provincial, flatly wrong, or even evil."

The inserted sentence then comments on this experience:

"This philosophical cut at one's core beliefs, values, and way of life is difficult enough."

The paragraph can then continue:

"When beliefs previously held as truths are rendered implausible, new beliefs, values, and ways of living may be required."

This progression is perfectly logical:

1. Philosophy challenges existing beliefs.
2. Such a challenge is already difficult.
3. The difficulty becomes even greater when one must replace those beliefs with new ones.

The phrase **“What’s worse”** in the next sentence further strengthens this placement because it introduces an escalation of difficulty. First, the paragraph says the philosophical challenge is difficult enough; then it adds that philosophers often do not provide immediate answers, making the situation even worse.

Let us examine the other options:

Option A (Blank 1)

Placing the sentence here would be awkward because the phrase **“This philosophical cut”** would appear before the paragraph has fully developed the idea of beliefs being challenged. The reference is not yet sufficiently established.

Option C (Blank 3)

By this point, the paragraph is discussing philosophers' refusal to provide immediate solutions and the strictly critical nature of some philosophical writing. The given sentence refers specifically to the initial challenge to one's beliefs, making it too late in the paragraph to fit naturally.

Option D (Blank 4)

The final part of the paragraph summarizes the overall effects of reading philosophy, including the possibility of enduring doubt. Inserting the given sentence here would interrupt the concluding tone and weaken the paragraph's closure.

Therefore, **Blank B (Option 2)** is the most appropriate position because it creates a smooth and logical transition from the challenge to one's existing beliefs to the even greater challenge of constructing new ones. Hence, **Option B** is the correct answer.

18. Correct Answer: C

This is a **sentence insertion** question that tests your ability to track the flow of ideas and identify how different pieces of information are logically connected. A useful strategy is to look for references, cause-and-effect relationships, and transitions between scientific findings and their implications.

The given sentence is:

“The discovery helps to explain archeological similarities between the Paleolithic peoples of China, Japan, and the Americas.”

Notice the phrase **“The discovery”**. This clearly refers to the genetic finding discussed in the preceding sentences. The sentence also introduces the idea of **archaeological similarities**, which means it should ideally be placed just before the paragraph begins discussing specific archaeological evidence.

Let us examine the flow around **Blank C (Option 3)**:

“We were surprised to find that this ancestral source also contributed to the Japanese gene pool, especially the indigenous Ainus,” says Li.

[Inserted Sentence]

“They shared similarities in how they crafted stemmed projectile points for arrowheads and spears.”

This creates a perfect progression:

1. Researchers discover a genetic connection.
 2. The inserted sentence explains the significance of that discovery by linking it to archaeological evidence.
 3. The next sentence provides a concrete example of those archaeological similarities—namely, the shared technique of crafting projectile points.
- Thus, the inserted sentence acts as a bridge between the **genetic findings** and the **archaeological observations**, making **Blank C** the most logical position.

Let us eliminate the other options:

Option A (Blank 1)

At this point, the paragraph has only introduced the existence of a genetic link. The discussion has not yet provided enough detail about the discovery or its implications. Introducing archaeological similarities here would be premature.

Option B (Blank 2)

This position comes immediately after a description of migration patterns. The focus is still on tracing ancestral movements and genetic origins. The inserted sentence would disrupt the flow because the paragraph has not yet completed its discussion of the genetic findings.

Option D (Blank 4)

By this stage, the paragraph has already discussed the archaeological similarities in the crafting of projectile points. The concluding quotation then broadens the argument by stating that the connection was both cultural and genetic. Inserting the sentence here would be repetitive because the archaeological evidence has already been presented.

Therefore, **Blank C (Option 3)** is the best fit because it smoothly connects the genetic discovery to the archaeological evidence that follows, creating a clear and coherent progression of ideas. Hence, **Option C** is the correct answer.



19. Correct Answer: 3

This is an **odd-one-out** question, where the objective is to identify the sentence that does not fit into the central theme developed by the other four sentences. The key is to first identify the common idea connecting most of the sentences and then find the one that deviates from that line of discussion.

The common theme in Sentences **1, 2, 4, and 5** is the **irregular and somewhat illogical structure of number names in English**.

A coherent paragraph can be formed as follows:

Sentence 1 introduces the idea that English does not follow a systematic naming rule for numbers.

Sentence 5 elaborates on this irregularity by pointing out that one cannot logically derive the word "eleven"; a learner might reasonably expect something like "one-teen."

Sentence 4 continues the discussion by showing that English adopts yet another naming pattern for multiples of ten, such as "twenty," "thirty," and "forty."

Sentence 2 further highlights the confusion by noting that words like "fourteen" invert the order of the numbers they represent.

Together, these four sentences consistently focus on the **unpredictable and confusing nature of English number nomenclature**.

Sentence 3 is the odd one out because it shifts the discussion from the structure of the number system to the **difficulty children face in learning it**. While this idea is related to the consequences of the irregular naming system, it changes the focus from describing the language pattern itself to discussing language acquisition and learning challenges.

A useful test for odd-one-out questions is to ask: *Does this sentence explain the main idea, or does it merely describe an effect of that idea?* Here, Sentences 1, 2, 4, and 5 explain the irregularities in English number names, whereas Sentence 3 discusses the impact of those irregularities on children. Hence, it does not belong to the core discussion.

Therefore, **Sentence 3** is the odd sentence.

20. Correct Answer: 2

This is an **odd-one-out** question in which you need to identify the sentence that does not contribute to the most coherent paragraph formed by the remaining four sentences. The best approach is to first identify the central theme and then look for logical links, pronoun references, and the overall flow of ideas.

The common theme running through Sentences **1, 3, 4, and 5** is the **human capacity to understand the mental states of others**, along with its significance, development, and evolutionary origins.

A coherent paragraph can be constructed as follows:

Sentence 5 serves as the ideal opening by introducing the topic:

"One of the most fascinating human capacities is the ability to perceive and interpret other people's behaviour in terms of their mental states."

Sentence 1 naturally follows by explaining why this capacity is important:

"Having an appreciation for the workings of another person's mind is considered a prerequisite..."

Sentence 4 continues the discussion by describing how this capacity develops over a person's lifetime:

"This capacity develops from early beginnings..."

Sentence 3 concludes the paragraph by shifting to its evolutionary history:

"Though we must speculate about its evolutionary origin..."

Thus, the sequence **5-1-4-3** forms a smooth and coherent paragraph discussing the nature, importance, development, and evolution of this human ability.

Now consider **Sentence 2**:

"It is a 'theory of mind' though some scholars prefer to call it 'mentalizing' or 'mindreading', which is important for the development of one's cognitive abilities."

This sentence primarily introduces terminology and alternative labels for the concept. While it is related to the topic, it does not advance the core discussion. More importantly, it creates structural problems:

The pronoun **"It"** requires a clear antecedent, making it unsuitable as an opening sentence.

The paragraph formed by 5-1-4-3 is already complete and coherent without introducing technical labels.

Sentence 2 functions more like a definitional aside or explanatory note rather than a necessary step in the development of the paragraph's main idea.

In odd-one-out questions, the odd sentence is often not completely unrelated; rather, it is the sentence that is **least essential to the logical progression of the paragraph**. Here, Sentence 2 discusses nomenclature, whereas the other sentences focus on the capacity itself—its importance, development, and evolution.

Therefore, **Sentence 2** is the odd sentence.

21. Correct Answer: 4123

This is a **Para-jumble** question that tests your ability to identify the logical flow of ideas and establish meaningful connections between sentences. The key is to look for introductory statements, cause-and-effect relationships, references, and suitable concluding sentences.

Let us analyze the sentences:

Sentence 4:

"The impact of biased decisions made by humans is localised and geographically confined, but with the advent of AI, the impact of such decisions is spread over a much wider scale."

This sentence introduces the central theme of the paragraph: a comparison between human bias and AI-driven bias. Since it presents the broad idea and sets up the discussion, it is the most suitable opening sentence.

Sentence 1:

"Algorithms hosted on the internet are accessed by many, so biases in AI models have resulted in much larger impact, adversely affecting far larger groups of people."

This sentence naturally follows Sentence 4. Sentence 4 states that AI has expanded the scale of biased decisions, and Sentence 1 explains **why** this happens—because internet-based algorithms affect vast numbers of users. Thus, **4 → 1** forms a strong logical pair.

Sentence 2:

"Though 'algorithmic bias' is the popular term, the foundation of such bias is not in algorithms, but in the data; algorithms are not biased, data is, as algorithms merely reflect persistent patterns that are present in the training data."

After discussing the large-scale impact of AI bias, the paragraph logically shifts to explaining the **source** of that bias. Sentence 2 clarifies a common misconception by stating that the bias originates in the data rather than in the algorithms themselves. Hence, it follows Sentence 1 smoothly.

Sentence 3:

"Despite their widespread impact, it is relatively easier to fix AI biases than human-generated biases, as it is simpler to identify the former than to try to make people unlearn behaviors learnt over generations."

The phrase **“Despite their widespread impact”** refers back to the discussion in Sentences 4 and 1 about the extensive reach of AI bias. Sentence 3 then provides a concluding insight: although AI bias affects many people, it is still easier to identify and correct than deeply ingrained human bias. This makes it an ideal concluding sentence.

Therefore, the logical flow is:

4 introduces the contrast between human and AI bias.

1 explains how AI amplifies the scale of biased outcomes.

2 clarifies the true source of AI bias.

3 concludes by comparing the ease of correcting AI bias versus human bias.

Hence, the correct sequence is: **4 → 1 → 2 → 3**

Correct Answer: 4123



22. Correct Answer: 4123

This is a **Para-jumble** question that requires you to identify the logical progression of ideas and arrange the sentences into a coherent paragraph. A useful approach is to first identify the opening sentence, then look for question-answer relationships, pronoun references, and explanatory links.

Let us examine the sentences one by one.

Sentence 4:

“Why are some crimes destined for perpetual re-examination and others locked into permanent obscurity?”

This sentence introduces the central issue of the paragraph in the form of a broad question. It raises the topic of why certain crimes continue to attract attention while others are forgotten. Since it sets up the discussion, it is the most appropriate opening sentence.

Sentence 1:

“What precisely are the ‘unusual elements’ that make a particular case so attractive to a certain kind of audience?”

This sentence naturally follows Sentence 4. After asking why some crimes remain in public memory, the author narrows the discussion by asking what specific features or “unusual elements” make certain cases especially compelling. Thus, **4** → **1** forms a clear question-to-question progression.

Sentence 2:

“It might be a particularly savage or unfathomable level of depravity, very often it has something to do with the precise amount of mystery involved.”

Sentence 2 directly answers the question posed in Sentence 1. The pronoun **“It”** refers to the “unusual elements” mentioned in Sentence 1, making this a strong mandatory pair. The sentence provides examples of the factors that make certain crimes fascinating: extreme brutality or an element of mystery.

Therefore, **1** → **2** is a natural and logical connection.

Sentence 3:

“Unsolved, and perhaps unsolvable cases offer something that ‘ordinary’ murder doesn’t.”

Sentence 2 highlights the role of mystery, and Sentence 3 builds on that idea by explaining that unsolved cases possess a unique appeal that ordinary crimes lack. It serves as a conclusion to the discussion by emphasizing why mysterious crimes continue to attract attention over time.

Hence, Sentence 3 is best placed at the end.

The complete logical flow is:

4 introduces the broader question.

1 narrows the focus to the characteristics of such crimes.

2 answers that question by identifying those characteristics.

3 concludes by highlighting the special appeal of unsolved mysteries.

Therefore, the correct sequence is: **4** → **1** → **2** → **3**

Correct Answer: 4123

23. Correct Answer: D

This is a **summary-selection** question, where the objective is to identify the option that captures the **central idea of the entire passage** without being too narrow, too broad, or introducing information not present in the text. A good summary should cover all the major points while preserving the author's emphasis.

The passage makes two key points:

1. Manipulation of information is not a new phenomenon. It existed even in ancient times, as illustrated by Octavian's smear campaign against Antony.

2. The scale and impact of such manipulation have increased dramatically in the modern era because technology and social media make it easier to create, spread, and amplify false information.

Thus, the author's central argument is that the use of misinformation to gain influence or power has existed for centuries, but modern technology has greatly intensified its reach and effectiveness.

Option D captures both these ideas perfectly. It acknowledges the historical continuity of misinformation ("as old as the Octavian era") and highlights how it is now being amplified by technology. Therefore, it provides the most comprehensive summary of the passage.

Let us examine the other options:

Option A: People need to become critical of what they read, since historically, weaponization of information has led to corruption.

This option introduces an advisory message ("People need to become critical") that is not present in the passage. The author describes the phenomenon of misinformation but does not prescribe a solution or urge readers to adopt a particular attitude. Hence, this option goes beyond the scope of the passage.

Option B: Octavian used fake news to manipulate people and attain power and influence, just as people do today.

This option focuses too heavily on the example of Octavian. The Roman example is merely an illustration used to establish the historical roots of misinformation. The broader discussion about technology, social media, and large-scale modern disinformation is missing, making this summary incomplete.

Option C: Disinformation, which is mediated by technology today, is not new and has existed since ancient times.

This option captures part of the passage correctly, namely the continuity of disinformation from ancient times to the present. However, it fails to emphasize the author's key point that the **21st century has witnessed an unprecedented weaponization of information due to technological advancements**. The idea of increased scale and impact is missing.

Option D: Use of misinformation for attaining power, a practice that is as old as the Octavian era, is currently fueled by technology.

This option effectively combines both major themes of the passage: the historical use of misinformation for power and influence, and the role of modern technology in magnifying its impact.

Therefore, **Option D** is the best summary of the passage.

24. Correct Answer: D

This is a **summary-selection** question that tests your ability to identify the main idea of a passage while avoiding options that are either too narrow, factually inaccurate, or incomplete. The best summary should capture both the **historical context** and the **central transformation** discussed by the author.

The passage begins by stating that **colonialism existed long before the modern era** and was a common feature of world history. However, it emphasizes that the **16th century marked a decisive turning point** because advances in navigation technology enabled Europeans to travel across oceans, settle distant territories, and maintain political control over them. This gave rise to the modern European colonial project characterized by settlement, dispossession, and political domination.

Therefore, the core idea of the passage is that **technological advancements in navigation transformed colonialism by allowing Europeans to establish settlements and exercise control over geographically distant regions**.

Option D captures this idea most accurately. It includes:

the crucial role of **navigation technology**,
the **transformation of colonialism** in the 16th century,
the establishment of **settlements**, and
the exercise of **political dominance** over distant territories.
Hence, it is the best summary of the passage.

Let us examine the other options:

Option A: Colonialism surged in the 16th century due to advancements in navigation, enabling British settlements abroad and global dominance.

This option is incorrect because the passage refers to **European colonialism in general**, not specifically British colonialism. The mention of "British settlements" introduces information not found in the passage. Therefore, the option is too narrow and factually unsupported.

Option B: As a result of developments in navigation technology, European colonialism led to the displacement of indigenous populations and global political changes in the 16th century.

While the passage does mention violent dispossession, the primary focus is on how navigation technology transformed colonialism by enabling settlement and political control. This option shifts the emphasis toward the consequences of colonialism rather than the transformation that made it possible. As a result, it captures only part of the passage.

Option C: Colonialism, conceptualized in the 16th century, allowed colonizers to expand their territories, establish settlements, and exercise political power.

This option is inaccurate because the passage explicitly states that colonialism **was not a modern phenomenon** and existed long before the 16th century. The 16th century did not witness the conceptualization of colonialism; rather, it marked a significant transformation in its nature. Therefore, this option misrepresents the passage.

Option D: Technological advancements in navigation in the 16th century transformed colonialism, enabling Europeans to establish settlements and exert political dominance over distant regions.

This option accurately reflects the author's central argument and includes all the key elements of the passage without adding or omitting important information. Therefore, **Option D** is the best summary of the passage.

DILR

1. Correct Answer: A

After reading the set, we can write the following conditions.

1. There can be either 0 or 1 or 2 candidates from any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members cannot vote for a candidate from their own department.
4. Non-candidates from the same department vote for the same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate from OQ.

Since the questions are dubious, we can say there would be at least two cases.

Given only one candidate is from OQ and there are 5 faculties from OQ, there are 4 non-candidates from OQ. Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates from the same department voted for the same candidate, all 4 non-candidates from OQ vote for candidates either Q or R.

Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only; that implies there is one candidate from BH. R has got 5 votes which can be only from MS because of condition 4; that implies there are 2 candidates from MS. Further, it can be determined that there is no candidate from FA. Q has got 13 non-candidates' votes. They would be from the remaining departments FA (9) and OQ (4).

Now let us try to find which candidate is from which department. From condition 3, R cannot be from MS. Similarly, we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA (9) + OQ (4))
R (6)	P	5 (MS)
S (1)	Q	0

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in the same department. So, P is definitely one of the candidates from MS. R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P and S cannot be together. So, in MS, the candidates would be P and Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

P & Q are from same department.

2. Correct Answer: D

After reading the set, we can write the following conditions.

1. There can be either 0 or 1 or 2 candidates from any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members cannot vote for a candidate from their own department.
4. Non-candidates from the same department vote for the same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate from OQ.

Since the questions are dubious, we can say there would be at least two cases.

Given only one candidate is from OQ and there are 5 faculties from OQ, there are 4 non-candidates from OQ. Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates from the same department voted for the same candidate, all 4 non-candidates from OQ vote for candidates either Q or R.

Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only; that implies there is one candidate from BH. R has got 5 votes which can be only from MS because of condition 4; that implies there are 2 candidates from MS. Further, it can be determined that there is no candidate from FA. Q has got 13 non-candidates' votes. They would be from the remaining departments FA (9) and OQ (4).

Now let us try to find which candidate is from which department. From condition 3, R cannot be from MS. Similarly, we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA (9) + OQ (4))
R (6)	P	5 (MS)
S (1)	Q	0

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in the same department. So, P is definitely one of the candidates from MS. R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P and S cannot be together. So, in MS, the candidates would be P and Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

Q gets 9 from FA and 4 from OQ. So, answer is 9.

3. Correct Answer: B

After reading the set, we can write the following conditions.

1. There can be either 0 or 1 or 2 candidates from any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members cannot vote for a candidate from their own department.
4. Non-candidates from the same department vote for the same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate from OQ.

Since the questions are dubious, we can say there would be at least two cases.

Given only one candidate is from OQ and there are 5 faculties from OQ, there are 4 non-candidates from OQ. Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates from the same department voted for the same candidate, all 4 non-candidates from OQ vote for candidates either Q or R.

Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only; that implies there is one candidate from BH. R has got 5 votes which can be only from MS because of condition 4; that implies there are 2 candidates from MS. Further, it can be determined that there is no candidate from FA. Q has got 13 non-candidates' votes. They would be from the remaining departments FA (9) and OQ (4).

Now let us try to find which candidate is from which department. From condition 3, R cannot be from MS. Similarly, we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA (9) + OQ (4))
R (6)	P	5 (MS)
S (1)	Q	0

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in the same department. So, P is definitely one of the candidates from MS. R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P and S cannot be together. So, in MS, the candidates would be P and Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

Both statements are true.

4. Correct Answer: A

After reading the set, we can write the following conditions.

1. There can be either 0 or 1 or 2 candidates from any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members cannot vote for a candidate from their own department.
4. Non-candidates from the same department vote for the same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate from OQ.

Since the questions are dubious, we can say there would be at least two cases.

Given only one candidate is from OQ and there are 5 faculties from OQ, there are 4 non-candidates from OQ. Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates from the same department voted for the same candidate, all 4 non-candidates from OQ vote for candidates either Q or R.

Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only; that implies there is one candidate from BH. R has got 5 votes which can be only from MS because of condition 4; that implies there are 2 candidates from MS. Further, it can be determined that there is no candidate from FA. Q has got 13 non-candidates' votes. They would be from the remaining departments FA (9) and OQ (4).

Now let us try to find which candidate is from which department. From condition 3, R cannot be from MS. Similarly, we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA (9) + OQ (4))
R (6)	P	5 (MS)
S (1)	Q	0

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in the same department. So, P is definitely one of the candidates from MS. R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P and S cannot be together. So, in MS, the candidates would be P and Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

It is either Prof. Ramaswamy or Prof. Samuel.

5. Correct Answer: D

After reading the set, we can write the following conditions.

1. There can be either 0 or 1 or 2 candidates from any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members cannot vote for a candidate from their own department.
4. Non-candidates from the same department vote for the same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate from OQ.

Since the questions are dubious, we can say there would be at least two cases.

Given only one candidate is from OQ and there are 5 faculties from OQ, there are 4 non-candidates from OQ. Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates from the same department voted for the same candidate, all 4 non-candidates from OQ vote for candidates either Q or R.

Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only; that implies there is one candidate from BH. R has got 5 votes which can be only from MS because of condition 4; that implies there are 2 candidates from MS. Further, it can be determined that there is no candidate from FA. Q has got 13 non-candidates' votes. They would be from the remaining departments FA (9) and OQ (4).

Now let us try to find which candidate is from which department. From condition 3, R cannot be from MS. Similarly, we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA (9) + OQ (4))
R (6)	P	5 (MS)
S (1)	Q	0

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in the same department. So, P is definitely one of the candidates from MS. R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P and S cannot be together. So, in MS, the candidates would be P and Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

Only statement B is true.

6. Correct Answer: 3

Block XX				Block YY		
A ₁	B ₁	C ₁	Road	D ₁	E ₁	F ₁
A ₂	B ₂	C ₂		D ₂	E ₂	F ₂

Road

Let a = road adjacency value and b = neighbour count.

Here $a = 0$ or 1 or 2 and $b = 0$ or 1 or 2 or 3 .

There can be two possibilities for the house worth 24 lacs.

Case 1 – House has parking space:

Quoted price = $12 + 5a + 3b = 24 \Rightarrow 5a + 3b = 12$

The only possible solution is $a = 0$, $b = 4$, but b cannot be 4 as the maximum number of neighbours can be 3.

Case 2 – House has no parking space:

Quoted price = $10 + 5a + 3b = 24 \Rightarrow 5a + 3b = 14$

So, $a = 1$, $b = 3$. This means the house has 1 road adjacent and 3 neighbours, i.e. occupied houses. The only possibility is B_2 .

So, we can determine B_2 is vacant and worth 24 lacs. Also, A_2 , B_1 and C_2 are unoccupied. From condition (1), we can say A_1 and C_1 are unoccupied.

Block XX

×	√	×
A ₁	B ₁	C ₁
A ₂	B ₂	C ₂
√	(24L) ×	√

√ = occupied

× = Unoccupied

For block YY, both E_1 and E_2 are vacant. By condition 4, either the price of E_1 or E_2 is 15 lacs. Two cases arise.

Case 1: If E_1 is of 15 lacs.

Road adjacency value = 0.

If this house has no parking space, then, $10 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 5$, which is never possible.

If E_1 has parking space, then, $12 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 3 \Rightarrow b = 1$.

This means E_1 has one occupied neighbouring house. E_2 is already vacant. So, the occupied neighbour can be either D_1 or F_1 . Now, if F_1 is vacant then its quoted price = $10 + 3 = 13$ Lacs (As F_2 will be occupied). This is not possible as the least price of a house in Block YY is Rs 15 lakhs. Hence, F_1 is definitely occupied and D_1 is vacant. F_2 can be occupied or it can be vacant. So, we have for YY.

×	×	√
D ₁	E ₁	F ₁
√	×	
D ₂	E ₂	F ₂

Case 2: If E_2 is of 15 lacs.

We already know $a = 1$.

If E_2 has parking space, then, $12 + 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$, which is not possible.

If E_2 has no parking space, then, $10 + 5 \times 1 + 3b = 15 \Rightarrow 3b = 0 \Rightarrow b = 0$.

This means D_2 , E_1 and F_2 are vacant. That implies D_1 and F_1 are occupied by the condition that column D and column F have at least one occupied house, but this contradicts condition 1. So, this is an invalid case.
Answer is 3.

7. Correct Answer: C

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Road

Let a = road adjacency value and b = neighbour count.

Here $a = 0$ or 1 or 2 and $b = 0$ or 1 or 2 or 3 .

There can be two possibilities for the house worth 24 lacs.

Case 1 – House has parking space:

Quoted price = $12 + 5a + 3b = 24 \Rightarrow 5a + 3b = 12$

The only possible solution is $a = 0$, $b = 4$, but b cannot be 4 as the maximum number of neighbours can be 3.

Case 2 – House has no parking space:

Quoted price = $10 + 5a + 3b = 24 \Rightarrow 5a + 3b = 14$

So, $a = 1$, $b = 3$. This means the house has 1 road adjacent and 3 neighbours, i.e. occupied houses. The only possibility is B_2 .

So, we can determine B_2 is vacant and worth 24 lacs. Also, A_2 , B_1 and C_2 are unoccupied. From condition (1), we can say A_1 and C_1 are unoccupied.

Block XX

×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L) ×	√

√ = occupied

× = Unoccupied

For block YY, both E_1 and E_2 are vacant. By condition 4, either the price of E_1 or E_2 is 15 lacs. Two cases arise.

Case 1: If E_1 is of 15 lacs.

Road adjacency value = 0.

If this house has no parking space, then, $10 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 5$, which is never possible.

If E_1 has parking space, then, $12 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 3 \Rightarrow b = 1$.

This means E_1 has one occupied neighbouring house. E_2 is already vacant. So, the occupied neighbour can be either D_1 or F_1 . Now, if F_1 is vacant then its quoted price = $10 + 3 = 13$ Lacs (As F_2 will be occupied). This is not possible as the least price of a house in Block YY is Rs 15 lakhs. Hence, F_1 is definitely occupied and D_1 is vacant. F_2 can be occupied or it can be vacant. So, we have for YY.

×	×	√
D_1	E_1	F_1
√	×	

D ₂	E ₂	F ₂
----------------	----------------	----------------

Case 2: If E₂ is of 15 lacs.

We already know $a = 1$.

If E₂ has parking space, then, $12 + 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$, which is not possible.

If E₂ has no parking space, then, $10 + 5 \times 1 + 3b = 15 \Rightarrow 3b = 0 \Rightarrow b = 0$.

This means D₂, E₁ and F₂ are vacant. That implies D₁ and F₁ are occupied by the condition that column D and column F have at least one occupied house, but this contradicts condition 1. So, this is an invalid case.

Hence, D₂ and B₁ are definitely occupied.

Note: It is actual CAT question with some ambiguity. It had two correct options D2 as well as B1. So, we have changed the options.



8. Correct Answer: A

Block XX				Block YY		
A ₁	B ₁	C ₁	Road	D ₁	E ₁	F ₁
A ₂	B ₂	C ₂		D ₂	E ₂	F ₂

Road

Let a = road adjacency value and b = neighbour count.

Here $a = 0$ or 1 or 2 and $b = 0$ or 1 or 2 or 3 .

There can be two possibilities for the house worth 24 lacs.

Case 1 – House has parking space:

Quoted price = $12 + 5a + 3b = 24 \Rightarrow 5a + 3b = 12$

The only possible solution is $a = 0$, $b = 4$, but b cannot be 4 as the maximum number of neighbours can be 3.

Case 2 – House has no parking space:

Quoted price = $10 + 5a + 3b = 24 \Rightarrow 5a + 3b = 14$

So, $a = 1$, $b = 3$. This means the house has 1 road adjacent and 3 neighbours, i.e. occupied houses. The only possibility is B_2 .

So, we can determine B_2 is vacant and worth 24 lacs. Also, A_2 , B_1 and C_2 are unoccupied. From condition (1), we can say A_1 and C_1 are unoccupied.

Block XX

×	√	×
A ₁	B ₁	C ₁
A ₂	B ₂	C ₂
√	(24L) ×	√

√ = occupied

× = Unoccupied

For block YY, both E_1 and E_2 are vacant. By condition 4, either the price of E_1 or E_2 is 15 lacs. Two cases arise.

Case 1: If E_1 is of 15 lacs.

Road adjacency value = 0.

If this house has no parking space, then, $10 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 5$, which is never possible.

If E_1 has parking space, then, $12 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 3 \Rightarrow b = 1$.

This means E_1 has one occupied neighbouring house. E_2 is already vacant. So, the occupied neighbour can be either D_1 or F_1 . Now, if F_1 is vacant then its quoted price = $10 + 3 = 13$ Lacs (As F_2 will be occupied). This is not possible as the least price of a house in Block YY is Rs 15 lakhs. Hence, F_1 is definitely occupied and D_1 is vacant. F_2 can be occupied or it can be vacant. So, we have for YY.

×	×	√
D ₁	E ₁	F ₁
√	×	
D ₂	E ₂	F ₂

Case 2: If E_2 is of 15 lacs.

We already know $a = 1$.

If E_2 has parking space, then, $12 + 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$, which is not possible.

If E_2 has no parking space, then, $10 + 5 \times 1 + 3b = 15 \Rightarrow 3b = 0 \Rightarrow b = 0$.

This means D_2 , E_1 and F_2 are vacant. That implies D_1 and F_1 are occupied by the condition that column D and column F have at least one occupied house, but this contradicts condition 1. So, this is an invalid case.

Depending upon F_2 , whether it is occupied or vacant, the number of vacant houses in Row-2 are either 2 or 3.

9. Correct Answer: 21

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Road

Let a = road adjacency value and b = neighbour count.

Here $a = 0$ or 1 or 2 and $b = 0$ or 1 or 2 or 3 .

There can be two possibilities for the house worth 24 lacs.

Case 1 – House has parking space:

Quoted price = $12 + 5a + 3b = 24 \Rightarrow 5a + 3b = 12$

The only possible solution is $a = 0$, $b = 4$, but b cannot be 4 as the maximum number of neighbours can be 3.

Case 2 – House has no parking space:

Quoted price = $10 + 5a + 3b = 24 \Rightarrow 5a + 3b = 14$

So, $a = 1$, $b = 3$. This means the house has 1 road adjacent and 3 neighbours, i.e. occupied houses. The only possibility is B_2 .

So, we can determine B_2 is vacant and worth 24 lacs. Also, A_2 , B_1 and C_2 are unoccupied. From condition (1), we can say A_1 and C_1 are unoccupied.

Block XX

×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L)	√
	×	

√ = occupied

× = Unoccupied

For block YY, both E_1 and E_2 are vacant. By condition 4, either the price of E_1 or E_2 is 15 lacs. Two cases arise.

Case 1: If E_1 is of 15 lacs.

Road adjacency value = 0.

If this house has no parking space, then, $10 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 5$, which is never possible.

If E_1 has parking space, then, $12 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 3 \Rightarrow b = 1$.

This means E_1 has one occupied neighbouring house. E_2 is already vacant. So, the occupied neighbour can be either D_1 or F_1 . Now, if F_1 is vacant then its quoted price = $10 + 3 = 13$ Lacs (As F_2 will be occupied). This is not possible as the least price of a house in Block YY is Rs 15 lakhs. Hence, F_1 is definitely occupied and D_1 is vacant. F_2 can be occupied or it can be vacant. So, we have for YY.

×	×	√
---	---	---

D ₁	E ₁	F ₁
√	×	
D ₂	E ₂	F ₂

Case 2: If E₂ is of 15 lacs.

We already know $a = 1$.

If E₂ has parking space, then, $12 + 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$, which is not possible.

If E₂ has no parking space, then, $10 + 5 \times 1 + 3b = 15 \Rightarrow 3b = 0 \Rightarrow b = 0$.

This means D₂, E₁ and F₂ are vacant. That implies D₁ and F₁ are occupied by the condition that column D and column F have at least one occupied house, but this contradicts condition 1. So, this is an invalid case.

Maximum possible quoted price = $10 + 5 \times 1 + 3 \times 2 = 21$ Lacs

10. Correct Answer: C

Block XX				Block YY		
A ₁	B ₁	C ₁	Road	D ₁	E ₁	F ₁
A ₂	B ₂	C ₂		D ₂	E ₂	F ₂

Road

Let a = road adjacency value and b = neighbour count.

Here $a = 0$ or 1 or 2 and $b = 0$ or 1 or 2 or 3 .

There can be two possibilities for the house worth 24 lacs.

Case 1 – House has parking space:

Quoted price = $12 + 5a + 3b = 24 \Rightarrow 5a + 3b = 12$

The only possible solution is $a = 0$, $b = 4$, but b cannot be 4 as the maximum number of neighbours can be 3.

Case 2 – House has no parking space:

Quoted price = $10 + 5a + 3b = 24 \Rightarrow 5a + 3b = 14$

So, $a = 1$, $b = 3$. This means the house has 1 road adjacent and 3 neighbours, i.e. occupied houses. The only possibility is B₂.

So, we can determine B₂ is vacant and worth 24 lacs. Also, A₂, B₁ and C₂ are unoccupied. From condition (1), we can say A₁ and C₁ are unoccupied.

Block XX

×	√	×
A ₁	B ₁	C ₁
A ₂	B ₂	C ₂
√	(24L)	√
	×	

√ = occupied

× = Unoccupied

For block YY, both E₁ and E₂ are vacant. By condition 4, either the price of E₁ or E₂ is 15 lacs. Two cases arise.

Case 1: If E₁ is of 15 lacs.

Road adjacency value = 0.

If this house has no parking space, then, $10 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 5$, which is never possible.

If E₁ has parking space, then, $12 + 5 \times 0 + 3b = 15 \Rightarrow 3b = 3 \Rightarrow b = 1$.

This means E_1 has one occupied neighbouring house. E_2 is already vacant. So, the occupied neighbour can be either D_1 or F_1 . Now, if F_1 is vacant then its quoted price = $10 + 3 = 13$ Lacs (As F_2 will be occupied). This is not possible as the least price of a house in Block YY is Rs 15 lakhs. Hence, F_1 is definitely occupied and D_1 is vacant. F_2 can be occupied or it can be vacant. So, we have for YY.

×	×	√
D_1	E_1	F_1
√	×	
D_2	E_2	F_2

Case 2: If E_2 is of 15 lacs.

We already know $a = 1$.

If E_2 has parking space, then, $12 + 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$, which is not possible.

If E_2 has no parking space, then, $10 + 5 \times 1 + 3b = 15 \Rightarrow 3b = 0 \Rightarrow b = 0$.

This means D_2 , E_1 and F_2 are vacant. That implies D_1 and F_1 are occupied by the condition that column D and column F have at least one occupied house, but this contradicts condition 1. So, this is an invalid case.

E_1 has parking space.

11. Correct Answer: 0

Given slots are twenty 15-minute slots starting at 9 A.M. and ending at 2 P.M. Applicants are scheduled in each slot.

The total number of applicants is $10 \times 20 = 200$.

The number of US applications is 50% of the total, i.e. 50% of $200 = 100$.

Since the number of US applications was the same in all slots, US applications in each slot = $\frac{100}{20} = 5$.

It is given that I, V and N were scheduled for Schengen visa processing in that order, with the 9:15 A.M. slot. This means the number of Schengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30 A.M. slot in the others category. So, the number of applicants in the others category in each slot is at least 2.

Since the number of applicants in each slot is 10, it can be inferred that the number of Schengen and others applicants is 3 and 2 respectively. Hence, the number of UK applicants in a slot is 0.

Total number of counters = 10

US counters = 4

UK counters = 2

Schengen counters = 2

Others counters = 2

Given that US and UK applications require 10 minutes of processing time, Vijay was called at 9:25 A.M. (5th in line).

It is possible if processing time for Schengen visa is 12.5 minutes. On a particular day, I, V and N were scheduled for Schengen visa processing in the given order. They had the 9:15 A.M. slot but entered at 9:20 A.M. When they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and were ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be for UK and 2 would be for others.

So, for US (processing time 10 minutes), the slots counter-wise are:

Counter C1: 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20

Counter C2: 9:10, 9:25, 9:35, 9:45, 9:55, 10:10
 Counter C3: 9:10, 9:25, 9:40, 9:50, 10:00, 10:10
 Counter C4: 9:10, 9:25, 9:40, 9:55, 10:05, 10:15
 For Schengen visa (12.5 minutes) the slots are:
 Counter C1: 9:12:30, 9:25, 9:37:30
 Counter C2: 9:12:30, 9:32:30, 9:45
 For others (5 minutes) the slots are:
 Counter C1: 9:05, 9:20, 9:35
 Counter C2: 9:05, 9:20, 9:35

12. Correct Answer: 200

Given slots are twenty 15-minute slots starting at 9 A.M. and ending at 2 P.M. Applicants are scheduled in each slot.

The total number of applicants is $10 \times 20 = 200$.

The number of US applications is 50% of the total, i.e. 50% of 200 = 100.

Since the number of US applications was the same in all slots, US applications in each slot = $\frac{100}{20} = 5$.

It is given that I, V and N were scheduled for Schengen visa processing in that order, with the 9:15 A.M. slot. This means the number of Schengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30 A.M. slot in the others category. So, the number of applicants in the others category in each slot is at least 2.

Since the number of applicants in each slot is 10, it can be inferred that the number of Schengen and others applicants is 3 and 2 respectively. Hence, the number of UK applicants in a slot is 0.

Total number of counters = 10

US counters = 4

UK counters = 2

Schengen counters = 2

Others counters = 2

Given that US and UK applications require 10 minutes of processing time, Vijay was called at 9:25 A.M. (5th in line).

It is possible if processing time for Schengen visa is 12.5 minutes. On a particular day, I, V and N were scheduled for Schengen visa processing in the given order. They had the 9:15 A.M. slot but entered at 9:20 A.M. When they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and were ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be for UK and 2 would be for others.

So, for US (processing time 10 minutes), the slots counter-wise are:

Counter C1: 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20

Counter C2: 9:10, 9:25, 9:35, 9:45, 9:55, 10:10

Counter C3: 9:10, 9:25, 9:40, 9:50, 10:00, 10:10

Counter C4: 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 minutes) the slots are:

Counter C1: 9:12:30, 9:25, 9:37:30

Counter C2: 9:12:30, 9:32:30, 9:45

For others (5 minutes) the slots are:

Counter C1: 9:05, 9:20, 9:35

Counter C2: 9:05, 9:20, 9:35

For the others, the time taken to process an application is 5 minutes.

The time taken to process 40 applications is $40 \times 5 = 200$ minutes.

13. Correct Answer: A

Given slots are twenty 15-minute slots starting at 9 A.M. and ending at 2 P.M. Applicants are scheduled in each slot.

The total number of applicants is $10 \times 20 = 200$.

The number of US applications is 50% of the total, i.e. 50% of $200 = 100$.

Since the number of US applications was the same in all slots, US applications in each slot = $\frac{100}{20} = 5$.

It is given that I, V and N were scheduled for Schengen visa processing in that order, with the 9:15 A.M. slot. This means the number of Schengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30 A.M. slot in the others category. So, the number of applicants in the others category in each slot is at least 2.

Since the number of applicants in each slot is 10, it can be inferred that the number of Schengen and others applicants is 3 and 2 respectively. Hence, the number of UK applicants in a slot is 0.

Total number of counters = 10

US counters = 4

UK counters = 2

Schengen counters = 2

Others counters = 2

Given that US and UK applications require 10 minutes of processing time, Vijay was called at 9:25 A.M. (5th in line).

It is possible if processing time for Schengen visa is 12.5 minutes. On a particular day, I, V and N were scheduled for Schengen visa processing in the given order. They had the 9:15 A.M. slot but entered at 9:20 A.M. When they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and were ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be for UK and 2 would be for others.

So, for US (processing time 10 minutes), the slots counter-wise are:

Counter C1: 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20

Counter C2: 9:10, 9:25, 9:35, 9:45, 9:55, 10:10

Counter C3: 9:10, 9:25, 9:40, 9:50, 10:00, 10:10

Counter C4: 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 minutes) the slots are:

Counter C1: 9:12:30, 9:25, 9:37:30

Counter C2: 9:12:30, 9:32:30, 9:45

For others (5 minutes) the slots are:

Counter C1: 9:05, 9:20, 9:35

Counter C2: 9:05, 9:20, 9:35

Nandini's application is 6th in the Schengen applications. So, her process will end at 9:45 A.M.

14. Correct Answer: B

Given slots are twenty 15-minute slots starting at 9 A.M. and ending at 2 P.M. Applicants are scheduled in each slot.

The total number of applicants is $10 \times 20 = 200$.

The number of US applications is 50% of the total, i.e. $50\% \text{ of } 200 = 100$.

Since the number of US applications was the same in all slots, US applications in each slot = $\frac{100}{20} = 5$.

It is given that I, V and N were scheduled for Schengen visa processing in that order, with the 9:15 A.M. slot. This means the number of Schengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30 A.M. slot in the others category. So, the number of applicants in the others category in each slot is at least 2.

Since the number of applicants in each slot is 10, it can be inferred that the number of Schengen and others applicants is 3 and 2 respectively. Hence, the number of UK applicants in a slot is 0.

Total number of counters = 10

US counters = 4

UK counters = 2

Schengen counters = 2

Others counters = 2

Given that US and UK applications require 10 minutes of processing time, Vijay was called at 9:25 A.M. (5th in line).

It is possible if processing time for Schengen visa is 12.5 minutes. On a particular day, I, V and N were scheduled for Schengen visa processing in the given order. They had the 9:15 A.M. slot but entered at 9:20 A.M. When they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and were ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be for UK and 2 would be for others.

So, for US (processing time 10 minutes), the slots counter-wise are:

Counter C1: 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20

Counter C2: 9:10, 9:25, 9:35, 9:45, 9:55, 10:10

Counter C3: 9:10, 9:25, 9:40, 9:50, 10:00, 10:10

Counter C4: 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 minutes) the slots are:

Counter C1: 9:12:30, 9:25, 9:37:30

Counter C2: 9:12:30, 9:32:30, 9:45

For others (5 minutes) the slots are:

Counter C1: 9:05, 9:20, 9:35

Counter C2: 9:05, 9:20, 9:35

For Mahira, starting time is 9:30 A.M. So, for Nandini, starting time is 9:32:30. Hence, it is false.

15. Correct Answer: D

Given slots are twenty 15-minute slots starting at 9 A.M. and ending at 2 P.M. Applicants are scheduled in each slot.

The total number of applicants is $10 \times 20 = 200$.

The number of US applications is 50% of the total, i.e. $50\% \text{ of } 200 = 100$.

Since the number of US applications was the same in all slots, US applications in each slot = $\frac{100}{20} = 5$.

It is given that I, V and N were scheduled for Schengen visa processing in that order, with the 9:15 A.M. slot. This means the number of Schengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30 A.M. slot in the others category. So, the number of applicants in the others category in each slot is at least 2.

Since the number of applicants in each slot is 10, it can be inferred that the number of Schengen and others applicants is 3 and 2 respectively. Hence, the number of UK applicants in a slot is 0.

Total number of counters = 10

US counters = 4

UK counters = 2

Schengen counters = 2

Others counters = 2

Given that US and UK applications require 10 minutes of processing time, Vijay was called at 9:25 A.M. (5th in line).

It is possible if processing time for Schengen visa is 12.5 minutes. On a particular day, I, V and N were scheduled for Schengen visa processing in the given order. They had the 9:15 A.M. slot but entered at 9:20 A.M. When they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and were ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be for UK and 2 would be for others.

So, for US (processing time 10 minutes), the slots counter-wise are:

Counter C1: 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20

Counter C2: 9:10, 9:25, 9:35, 9:45, 9:55, 10:10

Counter C3: 9:10, 9:25, 9:40, 9:50, 10:00, 10:10

Counter C4: 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 minutes) the slots are:

Counter C1: 9:12:30, 9:25, 9:37:30

Counter C2: 9:12:30, 9:32:30, 9:45

For others (5 minutes) the slots are:

Counter C1: 9:05, 9:20, 9:35

Counter C2: 9:05, 9:20, 9:35

From the slots, we can see that the first slot took 20 minutes to complete, and after that the remaining 19 slots took 15 minutes each to complete the US application process.

So, total time taken = $20 + 15 \times 19 = 305$ minutes.

Hence the end time will be 9 A.M. + 305 minutes = 2:05 P.M.

16. Correct Answer: 0

To solve this set, the following definitions are used:

Mean = $\frac{\text{Sum of items}}{\text{Number of items}}$

Median = middle value after arranging the data in either ascending or descending order.

Mode = the number which appears the highest number of times.

Range = maximum number - minimum number.

Using the mean formula, the total of all ratings given by all restaurants to each worker is:

For Ullas, $U = 2.2 \times 5 = 11$.

For Vasu, $V = 3.8 \times 5 = 19$.

For Waman, $W = 3.4 \times 5 = 17$.

For Xavier, $X = 3.6 \times 5 = 18$.

For Yusuf, $Y = 2.6 \times 5 = 13$.

For Ullas, median rating is 2, i.e. the middle-most rating is 2. So, two lowest ratings are ≤ 2 . Also, the mode is 2, meaning there should be at least two 2's in the ratings. The range is 3, so Max rating – Min rating = 3. Restaurant R1 awarded a rating of 1 to U, which implies the maximum rating can be 4 only. So far, four ratings of U are 1, 4, 2, 2. Since their total is 11, all ratings are 1, 2, 2, 2, 4.

For V, the total is 19. If we give rating 5 every time, we get a total of 20. Therefore, ratings are 2, 4, 4, 4, 5 (because the range is 3).

For W, similarly, we can say ratings are 1, 2, 4, 5, 5.

For X, ratings are 1, 3, 4, 5, 5.

For Y, there are two modes, 1 and 4, meaning 1 and 4 will occur at least twice. So, ratings are 1, 1, 3, 4, 4.

Now Let us try to find a link between workers and restaurants.

	R1	R2	R3	R4	R5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	17	11	19	14	17		

Since total ratings given by restaurant R3 is 19, it is possible only if the remaining ratings are 4 and 4, because all 5's are already used.

For restaurant R4, possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4, giving a total of 14. So, possible rating sets are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3. But when we try 2, 4, 2, 3, 3, the table is not satisfied.

So, now we can make a new table.

	R1	R2	R3	R4	R5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Answer is 0.

17. Correct Answer: 0

To solve this set, the following definitions are used:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{Number of items}}$$

Median = middle value after arranging the data in either ascending or descending order.

Mode = the number which appears the highest number of times.

Range = maximum number – minimum number.

Using the mean formula, the total of all ratings given by all restaurants to each worker is:

For Ullas, $U = 2.2 \times 5 = 11$.

For Vasu, $V = 3.8 \times 5 = 19$.

For Waman, $W = 3.4 \times 5 = 17$.

For Xavier, $X = 3.6 \times 5 = 18$.

For Yusuf, $Y = 2.6 \times 5 = 13$.

For Ullas, median rating is 2, i.e. the middle-most rating is 2. So, two lowest ratings are ≤ 2 . Also, the mode is 2, meaning there should be at least two 2's in the ratings. The range is 3, so Max rating – Min rating = 3. Restaurant R1 awarded a rating of 1 to U, which implies the maximum rating can be 4 only. So far, four ratings of U are 1, 4, 2, 2. Since their total is 11, all ratings are 1, 2, 2, 2, 4.

For V, the total is 19. If we give rating 5 every time, we get a total of 20. Therefore, ratings are 2, 4, 4, 4, 5 (because the range is 3).

For W, similarly, we can say ratings are 1, 2, 4, 5, 5.

For X, ratings are 1, 3, 4, 5, 5.

For Y, there are two modes, 1 and 4, meaning 1 and 4 will occur at least twice. So, ratings are 1, 1, 3, 4, 4.

Now Let us try to find a link between workers and restaurants.

	R1	R2	R3	R4	R5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	17	11	19	14	17		

Since total ratings given by restaurant R3 is 19, it is possible only if the remaining ratings are 4 and 4, because all 5's are already used.

For restaurant R4, possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4, giving a total of 14. So, possible rating sets are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3. But when we try 2, 4, 2, 3, 3, the table is not satisfied.

So, now we can make a new table.

	R1	R2	R3	R4	R5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Answer is 0.

18. Correct Answer: 3

To solve this set, the following definitions are used:

Mean = $\frac{\text{Sum of items}}{\text{Number of items}}$.

Median = middle value after arranging the data in either ascending or descending order.

Mode = the number which appears the highest number of times.

Range = maximum number – minimum number.

Using the mean formula, the total of all ratings given by all restaurants to each worker is:

For Ullas, $U = 2.2 \times 5 = 11$.

For Vasu, $V = 3.8 \times 5 = 19$.

For Waman, $W = 3.4 \times 5 = 17$.

For Xavier, $X = 3.6 \times 5 = 18$.

For Yusuf, $Y = 2.6 \times 5 = 13$.

For Ullas, median rating is 2, i.e. the middle-most rating is 2. So, two lowest ratings are ≤ 2 . Also, the mode is 2, meaning there should be at least two 2's in the ratings. The range is 3, so Max rating – Min rating = 3. Restaurant R1 awarded a rating of 1 to U, which implies the maximum rating can be 4 only. So far, four ratings of U are 1, 4, 2, 2. Since their total is 11, all ratings are 1, 2, 2, 2, 4.

For V, the total is 19. If we give rating 5 every time, we get a total of 20. Therefore, ratings are 2, 4, 4, 4, 5 (because the range is 3).

For W, similarly, we can say ratings are 1, 2, 4, 5, 5.

For X, ratings are 1, 3, 4, 5, 5.

For Y, there are two modes, 1 and 4, meaning 1 and 4 will occur at least twice. So, ratings are 1, 1, 3, 4, 4.

Now Let us try to find a link between workers and restaurants.

	R1	R2	R3	R4	R5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	17	11	19	14	17		

Since total ratings given by restaurant R3 is 19, it is possible only if the remaining ratings are 4 and 4, because all 5's are already used.

For restaurant R4, possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4, giving a total of 14. So, possible rating sets are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3. But when we try 2, 4, 2, 3, 3, the table is not satisfied.

So, now we can make a new table.

	R1	R2	R3	R4	R5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Answer is 3.

19. Correct Answer: 4

To solve this set, the following definitions are used:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{Number of items}}$$

Median = middle value after arranging the data in either ascending or descending order.

Mode = the number which appears the highest number of times.

Range = maximum number – minimum number.

Using the mean formula, the total of all ratings given by all restaurants to each worker is:

For Ullas, $U = 2.2 \times 5 = 11$.

For Vasu, $V = 3.8 \times 5 = 19$.

For Waman, $W = 3.4 \times 5 = 17$.

For Xavier, $X = 3.6 \times 5 = 18$.

For Yusuf, $Y = 2.6 \times 5 = 13$.

For Ullas, median rating is 2, i.e. the middle-most rating is 2. So, two lowest ratings are ≤ 2 . Also, the mode is 2, meaning there should be at least two 2's in the ratings. The range is 3, so Max rating – Min rating = 3. Restaurant R1 awarded a rating of 1 to U, which implies the maximum rating can be 4 only. So far, four ratings of U are 1, 4, 2, 2. Since their total is 11, all ratings are 1, 2, 2, 2, 4.

For V, the total is 19. If we give rating 5 every time, we get a total of 20. Therefore, ratings are 2, 4, 4, 4, 5 (because the range is 3).

For W, similarly, we can say ratings are 1, 2, 4, 5, 5.

For X, ratings are 1, 3, 4, 5, 5.

For Y, there are two modes, 1 and 4, meaning 1 and 4 will occur at least twice. So, ratings are 1, 1, 3, 4, 4.

Now Let us try to find a link between workers and restaurants.

	R1	R2	R3	R4	R5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	17	11	19	14	17		

Since total ratings given by restaurant R3 is 19, it is possible only if the remaining ratings are 4 and 4, because all 5's are already used.

For restaurant R4, possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4, giving a total of 14. So, possible rating sets are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3. But when we try 2, 4, 2, 3, 3, the table is not satisfied.

So, now we can make a new table.

	R1	R2	R3	R4	R5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

The ratings of R3 are 1, 4, 4, 5, 5. Hence, the median is 4.

20. Answer: C

To solve this set, the following definitions are used:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{Number of items}}$$

Median = middle value after arranging the data in either ascending or descending order.

Mode = the number which appears the highest number of times.

Range = maximum number – minimum number.

Using the mean formula, the total of all ratings given by all restaurants to each worker is:

$$\text{For Ullas, } U = 2.2 \times 5 = 11.$$

$$\text{For Vasu, } V = 3.8 \times 5 = 19.$$

$$\text{For Waman, } W = 3.4 \times 5 = 17.$$

$$\text{For Xavier, } X = 3.6 \times 5 = 18.$$

$$\text{For Yusuf, } Y = 2.6 \times 5 = 13.$$

For Ullas, median rating is 2, i.e. the middle-most rating is 2. So, two lowest ratings are ≤ 2 . Also, the mode is 2, meaning there should be at least two 2's in the ratings. The range is 3, so Max rating – Min rating = 3. Restaurant R1 awarded a rating of 1 to U, which implies the maximum rating can be 4 only. So far, four ratings of U are 1, 4, 2, 2. Since their total is 11, all ratings are 1, 2, 2, 2, 4.

For V, the total is 19. If we give rating 5 every time, we get a total of 20. Therefore, ratings are 2, 4, 4, 4, 5 (because the range is 3).

For W, similarly, we can say ratings are 1, 2, 4, 5, 5.

For X, ratings are 1, 3, 4, 5, 5.

For Y, there are two modes, 1 and 4, meaning 1 and 4 will occur at least twice. So, ratings are 1, 1, 3, 4, 4.

Now Let us try to find a link between workers and restaurants.

	R1	R2	R3	R4	R5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	17	11	19	14	17		

Since total ratings given by restaurant R3 is 19, it is possible only if the remaining ratings are 4 and 4, because all 5's are already used.

For restaurant R4, possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4, giving a total of 14. So, possible rating sets are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3. But when we try 2, 4, 2, 3, 3, the table is not satisfied.

So, now we can make a new table.

	R1	R2	R3	R4	R5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

R2 has median 2 (given twice), with ratings (1, 1, 2, 2, 5).
 R3 has median 4 (given twice), with ratings (1, 4, 4, 5, 5).
 R4 has median 3 (given once), with ratings (1, 2, 3, 4, 4).
 R5 has median 4 (given twice), with ratings (2, 2, 4, 4, 5).
 So, the answer is R4.



Quant

1. Correct Answer: A

We have, $x^2 + (x - 2y - 1)^2 = -4y(x + y)$

$$x^2 + 4y(x + y) + (x - 2y - 1)^2 = 0$$

$$x^2 + 4yx + 4y^2 + (x - 2y - 1)^2 = 0$$

$$(x + 2y)^2 + (x - 2y - 1)^2 = 0$$

As both of these are square, so none of them could be negative. In order to make the sum as zero, they must be individually zero.

As such, $(x - 2y - 1)^2 = 0 \Rightarrow x - 2y - 1 = 0 \Rightarrow x - 2y = 1$. So, answer is 1.

2. Correct Answer: B

We have, $\sqrt{5x + 9} + \sqrt{5x - 9} = 3(2 + \sqrt{2})$

$$\sqrt{5x + 9} + \sqrt{5x - 9} = 6 + 3\sqrt{2}$$

$$\sqrt{5x + 9} + \sqrt{5x - 9} = \sqrt{36} + \sqrt{18}$$

Here we can observe difference between $\sqrt{5x + 9}$ and $\sqrt{5x - 9}$ also $\sqrt{36}$ and $\sqrt{18}$ is same.

From here we can equate,

$$\sqrt{5x + 9} = \sqrt{36}$$

$$\text{so, } 5x + 9 = 36 \Rightarrow x = 27/5$$

$$\text{Therefore, } 10x + 9 = 63$$

$$\sqrt{10x + 9} = \sqrt{63}$$

$$\sqrt{10x + 9} = 3\sqrt{7}.$$

3. Correct Answer: A

Firstly, doing prime factorization

$$168 = 2^3 \times 3^1 \times 7^1$$

$$1134 = 2^1 \times 3^4 \times 7^1$$

The least positive integer value of n in 1134^n to make 168 its factor, we need at least 2^3 in numerator, so minimum value of n must be 3.

$$1134^3 = 2^3 \times 3^{12} \times 7^3$$

$$168 = 2^3 \times 3^1 \times 7^1$$

The least positive integer value of m in 168^m to make 1134^n , its factor, we need at least 3^{12} in numerator, so minimum value of m must be 12.

Finally, $m + n = 12 + 3 = 15$.

4. Correct Answer: C

We have, $\text{Log}_x (x^2 + 12) = 4$

$$(x^2 + 12) = x^4 \Rightarrow x^4 - (x^2 + 12) = 0$$

$$\Rightarrow x^4 - x^2 - 12 = 0 \Rightarrow (x^2 - 4)(x^2 + 3) = 0$$

$$\Rightarrow x^2 = 4 \text{ and } x^2 = -3$$

Here x^2 cannot be negative so rejecting -3, we get $x^2 = 4 \Rightarrow x = 2$ and $x = -2$.

Now again x is in the base here, so it cannot be negative. As such $x = -2$ rejected.

Finally, we get, $x = 2$.

Further we are given,

$$3 \log_y x = 1 \Rightarrow \log_y x = 1/3 \Rightarrow x = y^{1/3}$$

$$\Rightarrow 2 = y^{1/3}$$

Cube on both sides, we get, $8 = y$

Hence, $x + y = 2 + 8 = 10$.

5. Correct Answer: 3

Given that, $2|x|(x^2 + 1) = 5x^2$

Let $y = |x|$

so, $y^2 = x^2$

rewriting the equation, we have,

$$2y(y^2 + 1) = 5y^2$$

we can cancel y from both the sides, means $x = 0$

we are left with

$$2(y^2 + 1) = 5y \Rightarrow 2y^2 + 2 = 5y$$

$$\Rightarrow 2y^2 - 5y + 2 = 0 \Rightarrow y = 1/2 \text{ and } 2.$$

We need integral value, so leaving $1/2$.

We have $y = 0, 2 \Rightarrow |x| = 0$ and 2

Therefore, x can have 3 values i.e., $0, 2, -2$.

6. Correct Answer: 2

Given, $x^3 + (2r + 1)x^2 + (4r + 1)x + 2 = 0$

Here the product of all three roots $= d/a = -2$.

One of the roots is given as -2 .

So, product of two roots, $a \times b = 1$

so, we can conclude $b = 1/a$

Now sum of all the three roots $= -b/a$

$$\Rightarrow a + 1/a - 2 = -(2r + 1) \Rightarrow a + 1/a = -2r + 1$$

We know that, value of $a + 1/a$ lies between -2 and 2 .

Therefore, we can conclude, $-2 \leq a + 1/a \leq 2$

$$\Rightarrow -2 \leq -2r + 1 \leq 2$$

$$\Rightarrow -3 \leq -2r \leq 3$$

$$\Rightarrow -3/2 \leq -r \leq 3/2$$

$\Rightarrow 3/2 \geq r \geq -3/2$. So minimum possible non-negative integral value will be 2 .

7. Correct Answer: 6

Given equation is $2x^2 - 6x + k = 0$

Its roots are α and β

$$\Rightarrow \alpha + \beta = 3$$

$$\Rightarrow \alpha \times \beta = k/2$$

For the second equation, $x^2 + px + p = 0$,

the roots are $(\alpha + \beta)$ and $\alpha\beta$

Here, sum of roots, $\alpha + \beta + \alpha \times \beta = -p$

$$3 + k/2 = -p$$

And product of roots, $(\alpha + \beta) \times \alpha \times \beta = p$

$$3 \times k/2 = p$$

Solving these two, we get,

$$k = -3/2 \text{ and } p = -9/4$$

$$\text{Solving } 8(k - p) = 8[-3/2 - (-9/4)] = 6$$

8. Correct Answer: C

Let marks of each girl $= g$ and marks of each boy $= b$

$$(4g + 6b)/10 = 24$$

$$4g + 6b = 240$$

$$2g + 3b = 120 \text{ -- (I)}$$

Given, marks of any girl are at most double the marks of any boy i.e. $g = 2b$ (max)
but marks of any girl are not less than the marks of any boy i.e. $g = b$ (min)

Putting max and min value of g in equation (I), we get

$$\text{at } g = 2b, 4b + 3b = 120 \Rightarrow b = 17.14$$

$$\text{at } g = b, 2b + 3b = 120 \Rightarrow b = 24$$

we need to solve for $2g + 6b$

$$\text{at } g = 2b, 4b + 6b = 10b \Rightarrow 10 \times 17.14 = 171.4$$

$$\text{at } g = b, 2b + 6b = 8b \Rightarrow 8 \times 24 = 192$$

So, value range for 172 till 192, total 21 values.

9. Correct Answer: C

Using the formula for angle between the hands of clock.

$$q = 11M/2 - 30H$$

q = Angle between the two hands.

H = Position of hour hand initially.

M = Position of Minute hand lastly.

At 8:48

$$q = 48 \times 11/2 - 30 \times 8 = 24^\circ. \text{ Now, increasing 24 by 50\%, we get } = 36^\circ.$$

Time between 8 and 9 the hands of a clock make an angle of 36°

$$q = 11M/2 - 30H$$

$$36 = 11M/2 - 30 \times 8$$

$$M = 552/11 = 50 \text{ (2/11)}$$

$$\text{Difference in minutes} = 50 \text{ (2/11)} - 48 = 24/11$$

10. Correct Answer: B

Ratio of the salaries of Sita, Gita and Mita is given as 5: 6: 7

After respective hike of 20%, 25% and 20%, it becomes = 6: 7.5: 8.4

The second year, after Sita and Mita get salary hikes of 40% and 25%, respectively, we get = 8.4: x : 10.5

Now given, the salary of Gita becomes equal to the mean salary of the three friends which is = x

$$(8.4 + x + 10.5) / 3 = x \Rightarrow x = 9.45$$

Salary of Gita increases from 7.5 to 9.45, so percentage increase will be = $(9.45 - 7.5) / 7.5 \times 100 = 26\%$

11. Correct Answer: A

The ratio of coffee and cocoa in the mixture Q is 16: 9. Means ratio of final to total coffee = 16: 25

$$\text{By applying the formula for repeated mixture, } \frac{16}{25} = 1[(1 - \frac{\text{taken out}}{\text{total}})^2]$$

$$\Rightarrow \frac{\text{taken out}}{\text{total}} = \frac{1}{5}$$

It means, in first go, $1/5$ of coffee is replaced by cocoa powder and in second go, $1/5$ of mixture was replaced by cocoa powder.

cocoa in mixture P = $1/5$

and cocoa in mixture Q is = $9/25$

ratio of cocoa in mixture P to that in mixture Q is $(1/5) / (9/25) = 5: 9$.

12. Correct Answer: A

Let CP of first = a and CP of second = b

Profit of 20% on a.

SP of first will be = 1.2a

Loss of 10% on second.

SP of second will be = 0.9b

As, SP of both is same, so, $1.2a = 0.9b$

or $0.9b = 1.2a$

To have a profit of 10% on b means 1.1b, when $0.9b = 1.2a$

then $1.1b = 1.466a$

that means a profit of 47% on first object A.

13. Correct Answer: B

Option 1: $26862 - 8 \times 90 = 26142$ (Not a palindrome)

Option 2: $26862 - 8 \times 100 = 26062$ (a palindrome)

Option 3: $26862 - 8 \times 80 = 26222$ (Not a palindrome)

Option 4: $26862 - 8 \times 110 = 25980$ (Not a palindrome)

Hence, option 2.

14. Correct Answer: 27

Kamal takes twice as much time as Amal to do the same amount of job.

So, if one day work of Amal is '2a' then one day work of Kamal will be 'a'.

Let one day work of Sunil be 'x'.

Now, amount of job that Amal, Sunil and Kamal can individually do in a day, are in harmonic progression

So, $2/x = 1/2a + 1/a$

$x = 4/3a$

Means, one day work of Sunil is '4/3a'

Amal and Sunil work for 4 days and 9 days, respectively, Kamal needs to work for 16 days to finish the

remaining job means total work will be = $8a + 12a + 16a = 36a$

Time taken by Sunil to finish the job working alone = $36a/(4/3a) = 27$ days.

15. Correct Answer: 972

Here, we have, $\frac{S_a}{S_b} = \sqrt{\frac{T_b}{T_a}}$

$$\Rightarrow \frac{54}{S_b} = \sqrt{\frac{24}{6}} \Rightarrow S_b = 27$$

Total distance = $54 \times 6 + 27 \times 24 = 972$ km.

16. Correct Answer: 20808

Let initial investment made by Sunil be x

As compounded half-yearly, time becomes 12 and rate becomes 2% for Anil and time becomes 10 and rate

becomes 2% for Sunil.

$$22000(1.02)^{12} = x(1.02)^{10} \times 1.1$$

$x = 20808$.

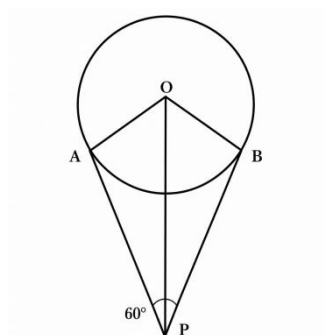
17. Correct Answer: D

From equation,

$$x^2 + y^2 + 4x - 6y - 3 = 0$$

We can conclude that center of circle will be at $(-2, 3)$.

$$\text{Radius} = \sqrt{(-2)^2 + (3)^2 - (-3)} = \sqrt{16} = 4$$



In triangle APC,

$$\angle A = 90^\circ$$

$$\angle APO = 30^\circ$$

$$\angle AOP = 60^\circ$$

As AO is 4, then OP will be 8.

For point P, x-coordinate is given as 6.

Applying distance formula,

$$[(x_2 - x_1)^2 + (y_2 - y_1)^2]^{1/2} = 8$$

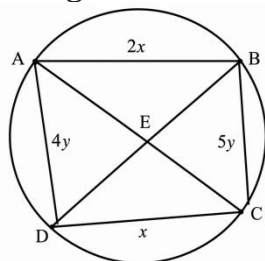
$$\Rightarrow \sqrt{(6 + 2)^2 + (y - 3)^2} = 8$$

$$\Rightarrow (y - 3)^2 = 0 \Rightarrow y = 3$$

Therefore, the circle touches the line $x = 6$ at exactly one point, which is $(6, 3)$

18. Correct Answer: C

In triangle AED and triangle BEC



$$\angle DAE = \angle CBE \text{ (angle by same arc)}$$

$$\angle ADE = \angle BCE \text{ (angle by same arc)}$$

So, triangle AED and triangle BEC are similar.

$$\frac{AE}{BE} = \frac{AD}{BC} = \frac{DE}{CE} = \frac{4}{5} \dots \text{(I)}$$

Similarly, triangle ABE and triangle DEC will be similar.

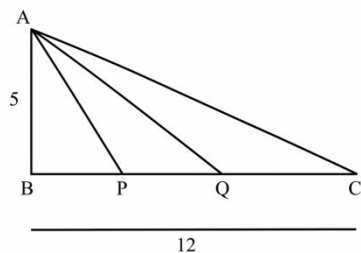
$$\frac{AE}{ED} = \frac{AB}{DC} = \frac{BE}{CE} = \frac{2}{1} \dots \text{(II)}$$

From (I) and (II), we get, $AE:CE = 8:5$.

19. Correct Answer: 2

Here the height of all the 3 triangles is equal, so area will be dependent on base.

Given, $\triangle ABC$ is 1.5 times the area of $\triangle ABP$.



So, length of $BC = 1.5 BP$.

$BP = 8$ and $BC = 12$

BP , BQ and BC are in arithmetic progression.

$BQ = (8 + 12)/2 = 10$.

Hence, $PQ = 10 - 8 = 2$.

20. Correct Answer: D

Considering all single digit number = 9 numbers

Considering 2-digit number:

First place can be filled in 9 ways because it cannot take zero.

Second place can be filled in 9 ways because repetition not allowed = $9 \times 9 = 81$ numbers

Considering 3-digit number:

First place can be filled in 9 ways because cannot take zero.

Second place can be filled in 9 ways because repetition not allowed.

Similarly, third place can be filled in 8 ways = $9 \times 9 \times 8 = 648$ numbers.

Total = $9 + 81 + 648 = 738$ numbers.



21. Correct Answer: A

$$\text{Given that, } \frac{1}{\sqrt{y}+\sqrt{z}} = \frac{\frac{1}{\sqrt{x}+\sqrt{z}} + \frac{1}{\sqrt{x}+\sqrt{y}}}{2}$$

$$\frac{2}{\sqrt{y}+\sqrt{z}} = \frac{2\sqrt{x} + \sqrt{z} + \sqrt{y}}{(\sqrt{x} + \sqrt{z})(\sqrt{x} + \sqrt{y})}$$

$$\frac{2(\sqrt{x} + \sqrt{z})(\sqrt{x} + \sqrt{y})}{(\sqrt{y} + \sqrt{z})} = 2\sqrt{x} + \sqrt{z} + \sqrt{y}$$

$$\frac{2[x + \sqrt{x}(\sqrt{y} + \sqrt{z}) + \sqrt{z}\sqrt{y}]}{\sqrt{y} + \sqrt{z}} = 2\sqrt{x} + \sqrt{z} + \sqrt{y}$$

$$\frac{2[x + \sqrt{z}\sqrt{y}]}{\sqrt{y} + \sqrt{z}} = \sqrt{y} + \sqrt{z} \Rightarrow 2x + 2\sqrt{z}\sqrt{y} = (\sqrt{y} + \sqrt{z})^2$$

$$\Rightarrow 2x + 2\sqrt{z}\sqrt{y} = y + z + 2\sqrt{z}\sqrt{y} \Rightarrow 2x = y + z \Rightarrow x = \frac{y+z}{2}$$

$\Rightarrow x$ is the Arithmetic Mean of y & z , therefore, y, x, z are in A.P.

22. Correct Answer: 19

No. of organisms on first day = 2, Second = $2 \times 2 + 3 = 7$, Third = $7 \times 2 + 3 = 17$

Forth = $17 \times 2 + 3 = 37$, Fifth = $37 \times 2 + 3 = 77$, Sixth = $77 \times 2 + 3 = 157$

Seventh = $157 \times 2 + 3 = 317$

When you look carefully you will realize, after 7 steps there is no much impact of +3 so we can consider that

after seventh term it only becomes double.

So, considering a GP with first term $a = 317$, $r = 2$ and $T_n > 10,00,000$

n will be 13. So, total it must be $6 + 13 = 19^{\text{th}}$ term.

Therefore, 19 is the answer.