Answer the following questions based on the information given below.

War, natural disasters and climate change are destroying some of the world's most precious cultural sites. Google is trying to help preserve these archaeological wonders by allowing users access to 3D images of these treasures through its site.

But the project is raising questions about Google's motivations and about who should own the digital copyrights. Some critics call it a form of "digital colonialism."

When it comes to archaeological treasures, the losses have been mounting. ISIS blew up parts of the ancient city of Palmyra in Syria and an earthquake hit Bagan, an ancient city in Myanmar, damaging dozens of temples, in 2016. In the past, all archaeologists and historians had for restoration and research were photos, drawings, remnants and intuition.

But that's changing. Before the earthquake at Bagan, many of the temples on the site were scanned. . . . [These] scans . . . are on Google's Arts & Culture site. The digital renditions allow viewers to virtually wander the halls of the temple, look up-close at paintings and turn the building over, to look up at its chambers   [Google Arts & Culture] works with museums and other nonprofits   to put high-quality images online.

The images of the temples in Bagan are part of a collaboration with CyArk, a nonprofit that creates the 3D scanning of historic sites. . . . Google   says [it] doesn't make money off this website, but it fits in with Google's mission to make the world's information available and useful.

Critics say the collaboration could be an attempt by a large corporation to wrap itself in the sheen of culture. Ethan Watrall, an archaeologist, professor at Michigan State University and a member of the Society for American Archaeology, says he's not comfortable with the arrangement between CyArk and Google   Watrall says this project is just a way for Google to promote Google. "They want to make this material accessible so people will browse it and be filled with wonder by it," he says. "But at its core, it's all about advertisements and driving traffic." Watrall says these images belong on the site of a museum or educational institution, where there is serious scholarship and a very different mission. . . .

[There's] another issue for some archaeologists and art historians. CyArk owns the copyrights of the scans — not the countries where these sites are located. That means the countries need CyArk's permission to use these images for commercial purposes.

Erin Thompson, a professor of art crime at John Jay College of Criminal Justice in New York City, says it's the latest example of a Western nation appropriating a foreign culture, a centuries-long battle ....CyArk says it copyrights the scans so no one can use them in an inappropriate way. The company says it works closely with authorities during the process, even training local people to help. But critics like Thompson are not persuaded..........She would prefer the scans to be owned by the countries and people where these sites are located.

1. By "digital colonialism", critics of the CyArk–Google project are referring to the fact that:
   (a) countries where the scanned sites are located do not own the scan copyrights.
   (b) CyArk and Google have not shared the details of digitisation with the host countries.
   (c) the scanning process can damage delicate frescos and statues at the sites.
   (d) CyArk and Google have been scanning images without copyright permission from host countries.

2. In Dr. Thompson's view, CyArk owning the copyright of its digital scans of archaeological sites is akin to:

   (a) the illegal downloading of content from the internet.
   (b) the seizing of ancient Egyptian artefacts by a Western museum.
   (c) digital platforms capturing users' data for market research.
   (d) tourists uploading photos of monuments onto social media.

3. Based on his views mentioned in the passage, one could best characterise Dr. Watrall as being:
   (a) dismissive of laypeople's access to specialist images of archaeological and cultural sites.

(b) uneasy about the marketing of archaeological images for commercial use by firms such as Google and CyArk.

(c) critical about the links between a non-profit and a commercial tech platform for distributing archaeological images.

(d) opposed to the use of digital technology in archaeological and cultural sites in developing countries.

4. Which of the following, if true, would most strongly invalidate Dr. Watrall's objections?

(a) CyArk uploads its scanned images of archaeological sites onto museum websites only.

(b) There is a ban on CyArk scanning archeological sites located in other countries.

(c) CyArk does not own the copyright on scanned images of archaeological sites.

(d) Google takes down advertisements on its website hosting CyArk's scanned images.

5. Of the following arguments, which one is LEAST likely to be used by the companies that digitally scan cultural sites?

(a) It enables people who cannot physically visit these sites to experience them.

(b) It provides images free of cost to all users.

(c) It allows a large corporation to project itself as a protector of culture.

(d) It helps preserve precious images in case the sites are damaged or destroyed.

Answer the following questions based on the information given below.

Around the world, capital cities are disgorging bureaucrats. In the post-colonial fervour of the 20th century, coastal capitals picked by trade-focused empires were spurned for "regionally neutral" new ones   But decamping wholesale is costly and unpopular; governments these days prefer piecemeal dispersal. The trend reflects how the world has changed. In past eras, when information travelled at a snail's pace, civil servants had to cluster together. But now desk-workers can ping emails and video-chat around the world. Travel for face-to-face meetings may be unavoidable, but transport links, too, have improved. . . .

Proponents of moving civil servants around promise countless benefits. It disperses the risk that a terrorist attack or natural disaster will cripple an entire government. Wonks in the sticks will be inspired by new ideas that walled-off capitals cannot conjure up. Autonomous regulators perform best far from the pressure and lobbying of the big city. Some even hail a cure for ascendant cynicism and populism. The unloved bureaucrats of faraway capitals will become as popular as firefighters once they mix with regular folk.

Beyond these sunny visions, dispersing central-government functions usually has three specific aims: to improve the lives of both civil servants and those living in clogged capitals; to save money; and to redress regional imbalances. The trouble is that these goals are not always realised.

The first aim—improving living conditions—has a long pedigree. After the second world war Britain moved thousands of civil servants to "agreeable English country towns" as London was rebuilt. But swapping the capital for somewhere smaller is not always agreeable. Attrition rates can exceed 80%.   The second reason to pack bureaucrats off is to save money. Office space costs far more in capitals   Agencies that are moved elsewhere can often recruit better workers on lower salaries than in capitals, where well-paying multinationals mop up talent.

The third reason to shift is to rebalance regional inequality.   Norway treats federal jobs as a resource every region deserves to enjoy, like profits from oil. Where government jobs go, private ones follow.   Sometimes the aim is to fulfil the potential of a country's second-tier cities. Unlike poor, remote places, bigger cities can make the most of relocated government agencies, linking them to local universities and businesses and supplying a better-educated workforce. The decision in 1946 to set up America's Centres for Disease Control in Atlanta rather than Washington, D.C., has transformed the city into a hub for health-sector research and business.

The dilemma is obvious. Pick small, poor towns, and areas of high unemployment get new jobs, but it is hard to attract the most qualified workers; opt for larger cities with infrastructure and better-qualified residents, and the country's most deprived areas see little benefit. . . .

Others contend that decentralisation begets corruption by making government agencies less accountable   A study in America found that state-government corruption is worse when the state capital is isolated—journalists, who tend to live in the bigger cities, become less watchful of those in power.

6. The "dilemma" mentioned in the passage refers to:
(a) relocating government agencies to boost growth in remote areas with poor amenities or to relatively larger cities with good amenities.
(b) concentrating on decongesting large cities or focusing on boosting employment in relatively larger cities.
(c) encouraging private enterprises to relocate to smaller towns or not incentivising them in order to keep government costs in those towns low.
(d) keeping government agencies in the largest city with good infrastructure or moving them to a remote area with few amenities.

7. The "long pedigree" of the aim to shift civil servants to improve their living standards implies that this move:
(a) is not a new idea and has been tried in the past.
(b) is supported by politicians and the ruling elites.
(c) takes a long time to achieve its intended outcomes.
(d) has become common practice in several countries worldwide.

8. According to the author, relocating government agencies has not always been a success for all of the following reasons EXCEPT:

(a) increased avenues of corruption away from the capital city.
(b) a rise in pollution levels and congestion in the new locations.
(c) the difficulty of attracting talented, well-skilled people in more remote areas.
(d) high staff losses, as people may not be prepared to move to smaller towns.

9. According to the passage, colonial powers located their capitals:
(a) to promote their trading interests.
(b) to showcase their power and prestige.
(c) where they had the densest populations.
(d) based on political expediency.

10. People who support decentralising central government functions are LEAST likely to cite which of the following reasons for their view?
(a) More independence could be enjoyed by regulatory bodies located away from political centres.
(b) It could weaken the nexus between bureaucrats and media in the capital.
(c) Policy makers may benefit from fresh thinking in a new environment.
(d) It reduces expenses as infrastructure costs and salaries are lower in smaller cities.

Answer the following question based on the information given below.

British colonial policy . . . went through two policy phases, or at least there were two strategies between which its policies actually oscillated, sometimes to its great advantage. At first, the new colonial apparatus exercised caution, and occupied India by a mix of military power and subtle diplomacy, the high ground in the middle of the circle of circles. This, however, pushed them into contradictions. For, whatever their sense of the strangeness of the country and the thinness of colonial presence, the British colonial state represented the great conquering discourse of Enlightenment rationalism, entering India precisely at the moment of its greatest unchecked arrogance. As inheritors and representatives of this discourse, which carried everything before it, this colonial state could hardly adopt for long such a self-denying attitude. It had restructured everything in Europe—the productive system, the political regimes, the moral and cognitive orders—and would do the same in India, particularly as some empirically inclined theorists of that generation considered the colonies a massive laboratory of utilitarian or other theoretical experiments. Consequently, the colonial state could not settle simply for eminence at the cost of its marginality; it began to take initiatives to introduce the logic of modernity into Indian society. But this modernity did not enter a passive society. Sometimes, its initiatives were resisted by pre-existing structural forms. At times, there was a more direct form of collective resistance. Therefore, the map of continuity and discontinuity that this state left behind at the time of independence was rather complex and has to be traced with care. Most significantly, of course, initiatives for . . . modernity came to assume an external character. The acceptance of modernity came to be connected, ineradicably, with subjection. This again points to two different problems, one theoretical, the other political. Theoretically, because modernity was externally introduced, it is explanatorily unhelpful to apply the logical format of the 'transition process' to this pattern of change. Such a logical format would be wrong on two counts. First, however subtly, it would imply that what was proposed to be built was something like European capitalism. (And, in any case, historians have forcefully argued that what it was to replace was not like feudalism, with or without modificatory adjectives.) But, more fundamentally, the logical structure of endogenous change does not apply here. Here transformation agendas attack as an external force. This externality is not something that can be casually mentioned and forgotten. It is inscribed on every move, every object, every proposal, every legislative act, each line of

causality. It comes to be marked on the epoch itself. This repetitive emphasis on externality should not be seen as a nationalist initiative that is so well rehearsed in Indian social science. . . .

Quite apart from the externality of the entire historical proposal of modernity, some of its contents were remarkable. . . . Economic reforms, or rather alterations . . . did not foreshadow the construction of a classical capitalist economy, with its necessary emphasis on extractive and transport sectors. What happened was the creation of a degenerate version of capitalism —what early dependency theorists called the 'development of underdevelopment'.

11. "Consequently, the colonial state could not settle simply for eminence at the cost of its marginality; it began to take initiatives to introduce the logic of modernity into Indian society." Which of the following best captures the sense of this statement?
   (a) The colonial enterprise was a costly one; so to justify the cost it began to take initiatives to introduce the logic of modernity into Indian society
   (b) The cost of the colonial state's eminence was not settled; therefore, it took the initiative of introducing modernity into Indian society.
   (c) The colonial state's eminence was unsettled by its marginal position; therefore, it developed Indian society by modernising it.
   (d) The colonial state felt marginalised from Indian society because of its own modernity; therefore, it sought to address that marginalisation by bringing its modernity to change Indian society.

12. All of the following statements about British colonialism can be inferred from the first paragraph, EXCEPT that it:
   (a) faced resistance from existing structural forms of Indian modernity.
   (b) allowed the treatment of colonies as experimental sites.
   (c) was at least partly shaped by the project of European modernity
   (d) was at least partly an outcome of Enlightenment rationalism.

13. Which of the following observations is a valid conclusion to draw from the author's statement that "the logical structure of endogenous change does not apply here. Here transformation agendas attack as an external force"?

   (a) The transformation of Indian society did not happen organically, but was forced by colonial agendas
   (b) Colonised societies cannot be changed through logic; they need to be transformed with external force.
   (c) The endogenous logic of colonialism can only bring change if it attacks and transforms external forces.
   (d) Indian society is not endogamous; it is more accurately characterised as aggressively exogamous.

14. All of the following statements, if true, could be seen as supporting the arguments in the passage, EXCEPT:
   (a) the change in British colonial policy was induced by resistance to modernity in Indian society.
   (b) modernity was imposed upon India by the British and, therefore, led to underdevelopment.
   (c) the introduction of capitalism in India was not through the transformation of feudalism, as happened in Europe.
   (d) throughout the history of colonial conquest, natives have often been experimented on by the colonisers.

15. Which one of the following 5-word sequences best captures the flow of the arguments in the passage?
   (a) Military power—arrogance—laboratory—modernity—capitalism.
   (b) Colonial policy—arrogant rationality—resistance—independence—development.
   (c) Military power—colonialism—restructuring—feudalism—capitalism.
   (d) Colonial policy—Enlightenment—external modernity—subjection—underdevelopment.

Answer the following question based on the information given below.

The magic of squatter cities is that they are improved steadily and gradually by their residents. To a planner's eye, these cities look chaotic. I trained as a biologist and to my eye, they look organic. Squatter cities are also unexpectedly green. They have maximum density—1 million people per square mile in some areas of Mumbai—and have minimum energy and material use. People get around by foot, bicycle, rickshaw, or the universal shared taxi. Not everything is efficient in the slums, though. In the Brazilian favelas where electricity is stolen and therefore free, people leave their lights on all day. But in most slums recycling is literally a way of life. The Dharavi slum in Mumbai has 400 recycling units and 30,000 ragpickers. Six thousand tons of rubbish are sorted every day. In 2007, the Economist reported that in Vietnam and Mozambique, "Waves of gleaners sift the sweepings of Hanoi's streets, just as Mozambiquan children pick over the rubbish of Maputo's main tip. Every city in Asia and Latin America has an industry based on gathering up old cardboard boxes." . . .

In his 1985 article, Calthorpe made a statement that still jars with most people: "The city is the most environmentally benign form of human settlement. Each city dweller consumes less land, less energy, less water, and produces less pollution than his counterpart in settlements of lower densities." "Green Manhattan" was the inflammatory title of a 2004 New Yorker article by David Owen. "By the most significant measures," he wrote, "New York is the greenest community in the United States, and one of the greenest cities in the world . . . The key to New York's relative environmental benignity is its extreme compactness   Placing one and a half million people on a twenty-three-square-mile island sharply reduces their opportunities to be wasteful." He went on to note that this very compactness forces people to live in the world's most energy-efficient apartment buildings. . . .

Urban density allows half of humanity to live on 2.8 per cent of the land.........Consider just the infrastructure efficiencies. According to a 2004 UN report: "The concentration of population and enterprises in urban areas greatly reduces the unit cost of piped water, sewers, drains, roads, electricity, garbage collection, transport, health care, and schools." . . .

[T]he nationally subsidised city of Manaus in northern Brazil "answers the question" of how to stop deforestation: give people decent jobs. Then they can afford houses, and gain security. One hundred thousand people who would otherwise be deforesting the jungle around Manaus are now prospering in town making such things as mobile phones and televisions. . . .

Of course, fast-growing cities are far from an unmitigated good. They concentrate crime, pollution, disease and injustice as much as business, innovation, education and entertainment.   But if they are overall a net good for those who move there, it is because cities offer more than just jobs. They are transformative: in the slums, as well as the office towers and leafy suburbs, the progress is from hick to metropolitan to cosmopolitan . . .

16. We can infer that Calthorpe's statement "still jars" with most people because most people:
   (a) do not regard cities as good places to live in.
   (b) consider cities to be very crowded and polluted.
   (c) regard cities as places of disease and crime.
   (d) do not consider cities to be eco-friendly places.

17. According to the passage, squatter cities are environment-friendly for all of the following reasons EXCEPT:
   (a) they sort out garbage.
   (b) their streets are kept clean.
   (c) their transportation is energy efficient.
   (d) they recycle material.

18. From the passage it can be inferred that cities are good places to live in for all of the following reasons EXCEPT that they:
   (a) help prevent destruction of the environment.
   (b) offer employment opportunities.
   (c) have suburban areas as well as office areas.
   (d) contribute to the cultural transformation of residents.

19. Which one of the following statements would undermine the author's stand regarding the greenness of cities?
   (a) Over the last decade the cost of utilities has been increasing for city dwellers.
   (b) Sorting through rubbish contributes to the rapid spread of diseases in the slums.
   (c) The compactness of big cities in the West increases the incidence of violent crime.
   (d) The high density of cities leads to an increase in carbon dioxide and global warming.

20. In the context of the passage, the author refers to Manaus in order to:
   (a) promote cities as employment hubs for people.
   (b) explain where cities source their labour for factories.
   (c) explain how urban areas help the environment.
   (d) describe the infrastructure efficiencies of living in a city.

Answer the following questions based on the information given below.

For two years, I tracked down dozens of . . . Chinese in Upper Egypt [who were] selling lingerie. In a deeply conservative region, where Egyptian families rarely allow women to work or own businesses, the Chinese flourished because of their status as outsiders. They didn't gossip, and they kept their opinions to themselves. In a New Yorker article entitled "Learning to Speak Lingerie," I described the Chinese use of Arabic as another non-threatening characteristic. I wrote, "Unlike Mandarin, Arabic is inflected for gender, and Chinese dealers, who learn the language strictly by ear, often pick up speech patterns from female customers. I've come to think of it as the lingerie dialect, and there's something disarming about these Chinese men speaking in the feminine voice." . . .

When I wrote about the Chinese in the New Yorker, most readers seemed to appreciate the unusual perspective. But as I often find with topics that involve the Middle East, some people had trouble getting past the black-and-white quality of a byline. "This piece is so orientalist I don't know what to do," Aisha Gani, a reporter who worked at The Guardian, tweeted. Another colleague at the British paper, Iman Amrani, agreed: "I wouldn't have minded an article on the subject written by an Egyptian woman—probably would have had better insight." . . . As an MOL (man of language), I also take issue with this kind of essentialism. Empathy and understanding are not inherited traits, and they are not strictly tied to gender and race. An individual who wrestles with a difficult language can learn to be more sympathetic to outsiders and open to different experiences of the world. This learning process—the embarrassments, the frustrations, the gradual sense of understanding and connection—is invariably transformative. In Upper Egypt, the Chinese experience of struggling to learn Arabic and local culture had made them much more thoughtful. In the same way, I was interested in their lives not because of some kind of voyeurism, but because I had also experienced Egypt and Arabic as an outsider. And both the Chinese and the Egyptians welcomed me because I spoke their languages. My identity as a white male was far less important than my ability to communicate.

And that easily lobbed word—"Orientalist"—hardly captures the complexity of our interactions. What exactly is the dynamic when a man from Missouri observes a Zhejiang native selling lingerie to an Upper Egyptian woman? . . . If all of us now stand beside the same river, speaking in ways we all understand, who's looking east and who's looking west? Which way is Oriental?

For all of our current interest in identity politics, there's no corresponding sense of identity linguistics. You are what you speak—the words that run throughout your mind are at least as fundamental to your selfhood as is your ethnicity or your gender. And sometimes it's healthy to consider human characteristics that are not inborn, rigid, and outwardly defined. After all, you can always learn another language and change who you are.

21. According to the passage, which of the following is not responsible for language's ability to change us?
  (a) Language's ability to mediate the impact of identity markers one is born with.
  (b) Language's intrinsic connection to our notions of self and identity
  (c) The twists and turns in the evolution of language over time.
  (d) The ups and downs involved in the course of learning a language.

22. A French ethnographer decides to study the culture of a Nigerian tribe. Which of the following is most likely to be the view of the author of the passage?
  (a) The author would encourage the ethnographer and recommend him/her to hire a good translator for the purpose of holding interviews.
  (b) The author would encourage the ethnographer, but ask him/her to first learn the language of the Nigerian tribe s/he wishes to study.
  (c) The author would discourage the ethnographer from conducting the study as Nigerian ethnographers can better understand the tribe.

  (d) The author would encourage the ethnographer, but ask him/her to be mindful of his/her racial and gender identity in the process.

23. Which of the following can be inferred from the author's claim, "Which way is Oriental?"
  (a) Learning another language can mitigate cultural hierarchies and barriers.
  (b) Orientalism is a discourse of the past, from colonial times, rarely visible today.
  (c) Globalisation has mitigated cultural hierarchies and barriers.
  (d) Goodwill alone mitigates cultural hierarchies and barriers.

24. The author's critics would argue that:
  (a) Language is insufficient to bridge cultural barriers.
  (b) Linguistic politics can be erased.
  (c) Empathy can overcome identity politics.
  (d) Orientalism cannot be practiced by Egyptians.

25. The four sentences (labelled 1, 2, 3, and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for

the sentences and key in this sequence of four numbers as your answer.

1. Living things—animals and plants—typically exhibit correlational structure.
2. Adaptive behaviour depends on cognitive economy, treating objects as equivalent.
3. The information we receive from our senses, from the world, typically has structure and order, and is not arbitrary.
4. To categorize an object means to consider it equivalent to other things in that category, and different—along some salient dimension— from things that are not.

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

1. Conceptualisations of 'women's time' as contrary to clock-time and clock-time as synonymous with economic rationalism are two of the deleterious results of this representation.
2. While dichotomies of 'men's time', 'women's time', clock-time, and caring time can be analytically useful, this article argues that everyday caring practices incorporate a multiplicity of times; and both men and women can engage in these multiple-times
3. When the everyday practices of working sole fathers and working sole mothers are carefully examined to explore conceptualisations of gendered time, it is found that caring time is often more focused on the clock than generally theorised.
4. Clock-time has been consistently represented in feminist literature as a masculine artefact representative of a 'time is money perspective.

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

1. To the uninitiated listener, atonal music can sound like chaotic, random noise.
2. Atonality is a condition of music in which the constructs of the music do not 'live' within the confines of a particular key signature, scale or mode.
3. After you realize the amount of knowledge, skill, and technical expertise required to compose or perform it, your tune may change, so to speak.
4. However, atonality is one of the most important movements in 20th century music.

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

1. A particularly interesting example of inference occurs in many single panel comics.
2. It's the creator's participation and imagination that makes the single-panel comic so engaging and so rewarding.
3. Often, the humor requires you to imagine what happened in the instant immediately before or immediately after the panel you're being shown.
4. To get the joke, you actually have to figure out what some of these missing panels must be.
5. It is as though the cartoonist devised a series of panels to tell the story and has chosen to show you only one – and typically not even the funniest.

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

1. Ocean plastic is problematic for a number of reasons, but primarily because marine animals eat it.
2. The largest numerical proportion of ocean plastic falls in small size fractions.
3. Aside from clogging up the digestive tracts of marine life, plastic also tends to adsorb pollutants from the water column.

4. Plastic in the oceans is arguably one of the most important and pervasive environmental problems today.
5. Eating plastic has a number of negative consequences such as the retention of plastic particles in the gut for longer periods than normal food particles.

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

Language is an autapomorphy found only in our lineage, and not shared with other branches of our group such as primates. We also have no definitive evidence that any species other than Homo sapiens ever had language. However, it must be noted straightaway that 'language' is not a monolithic entity, but rather a complex bundle of traits that must have evolved over a significant time frame…. Moreover, language crucially draws on aspects of cognition that are long established in the primate lineage, such as memory: the language faculty as a whole comprises more than just the uniquely linguistic features.

(a) Language is not a single, uniform entity but the end result of a long and complex process of linguistic evolution.
(b) Language, a derived trait found only in humans, has evolved over time and involves memory.
(c) Language is a distinctively human feature as there is no evidence of the existence of language in any other species.
(d) Language evolved with linguistic features building on features of cognition such as memory.

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

Social movement organizations often struggle to mobilize supporters from allied movements in their efforts to achieve critical mass. Organization with hybrid identities—those whose organizational identities span the boundaries of two or more social movements, issues, or identities—are vital to mobilizing these constituencies. Studies of the post-9/11 U.S. antiwar movement show that individuals with past involvement in non-anti-wa movements are more likely to join hybrid organizations than are individuals without involvement in non-anti-war movements. In addition, they show that organizations with hybrid identities occupy relatively more central positions in inter-organizational contact networks within the antiwar movemen and thus recruit significantly more participants in demonstrations than do nonhybrid organizations.

(a) Organizations with hybrid identities are able to mobilize individuals with different points of view.
(b) Movements that work towards social change often find it difficult to mobilize a critical mass of supporters.
(c) Hybrid organizations attract individuals that are deeply involved in anti-war movements.
(d) Post 9/11 studies show that people who are involved in non anti-war movements are likely to join hybrid organizations.

32. The four sentences (labelled 1, 2, 3, and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of four numbers as your answer.
1. Such a belief in the harmony of nature requires a purpose presumably imposed by the goodness and wisdom of a deity.
2. These parts, all fit together into an integrated, well-ordered system that was created by design.
3. Historically, the notion of a balance of nature is part observational, part metaphysical, and not scientific in any way.
4. It is an example of an ancient belief system called teleology, the notion that what we call nature has a predetermined destiny associated with its component parts.

33. Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph
Identify the odd one out. Choose its number as your answer and key it in.
1. Socrates told us that 'the unexamined life is not worth living' and that to 'know thyself' is the path to true wisdom
2. It suggests that you should adopt an ancient rhetorical method favored by the likes of Julius Caesar and known as 'illeism' – o speaking about yourself in the third person.
3. Research has shown that people who are prone to rumination also often suffer from impaired decision making under pressure and are at a substantially increased risk of depression.
4. Simple rumination – the process of churning your concerns around in your head – is not the way to achieve self-realization.

5. The idea is that this small change in perspective can clear your emotional fog, allowing you to see past your biases.

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

Privacy-challenged office workers may find it hard to believe, but open-plan offices and cubicles were invented by architects and designers who thought that to break down the social walls that divide people, you had to break down the real walls, too. Modernist architects saw walls and rooms a downright fascist. The spaciousness and flexibility of an open plan would liberate homeowners and office dwellers from the confines of boxes. Bu companies took up their idea less out of a democratic ideology than a desire to pack in as many workers as they could. The typical open-plan office o the first half of the 20th century was a white-collar assembly line. Cubicles were interior designers' attempt to put some soul back in.

(a) Wall-free office spaces did not quite work out as desired and therefore cubicles came into being.
(b) Wall-free office spaces could have worked out the way their utopian inventors intended had companies cared for workers' satisfaction.
(c) Wall-free office spaces did not quite work out the way their utopian inventors intended, as they became tools for exploitation of labor.
(d) Wall-free office spaces did not quite work out as companies don't believe in democratic ideology.

DATA INTERPRETATION AND LOGICAL REASONING

Answer the following questions based on the information given below.

To compare the rainfall data, India Meteorological Department (IMD) calculated the Long Period Average (LPA) of rainfall during period June-August for each of the 16 states. The figure given below shows the actual rainfall (measured in mm) during June-August, 2019 and the percentage deviations from LPA of respective states in 2018. Each state along with its actual rainfall is presented in the figure.
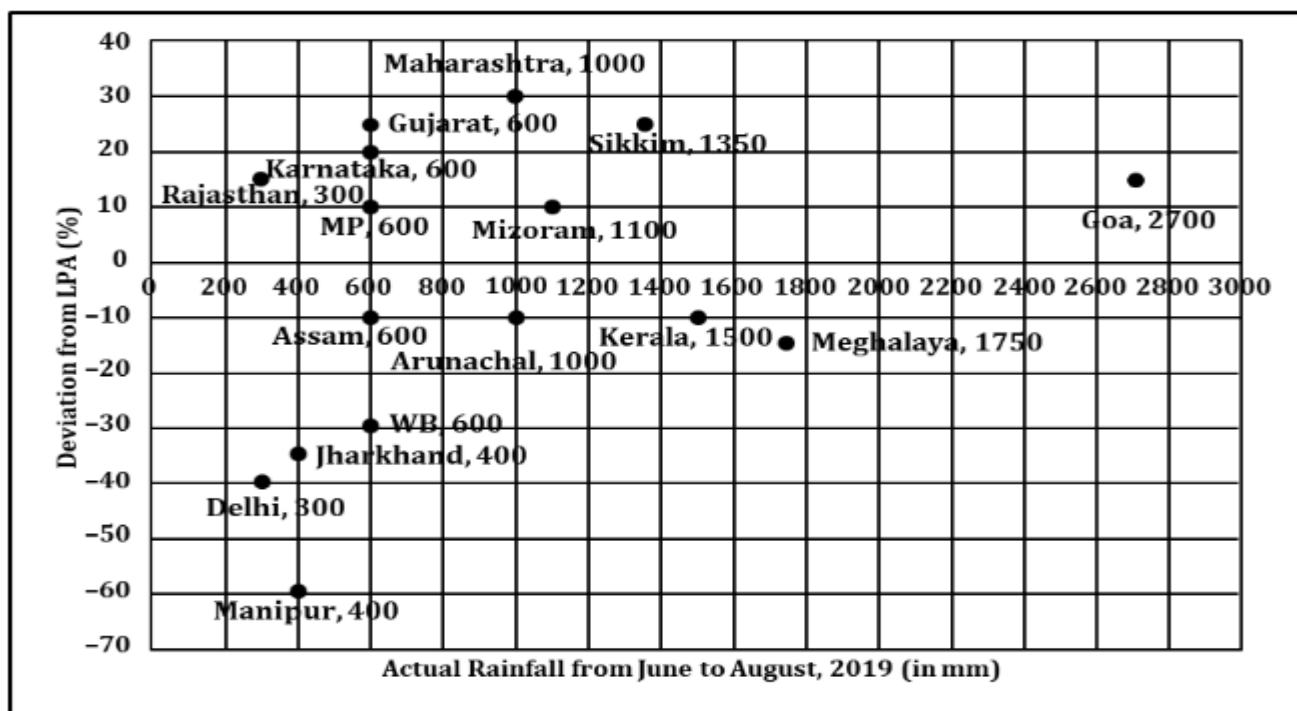
35. If a 'Heavy Monsoon State' is defined as a state with actual rainfall from June-August, 2019 of 900 mm or more, then approximately what percentage of 'Heavy Monsoon States' have a negative deviation from respective LPAs in 2019?
(a) 57.14
(b) 14.29
(c) 75.00
(d) 42.86

36. If a 'Low Monsoon State' is defined as a state with actual rainfall from June-August, 2019 of 750 mm or less, then what is the median 'deviation from LPA' (as defined in the Y-axis of the figure) of 'Low Monsoon States'?
(a) 10%
(b) –30%
(c) –10%
(d) –20%

37. What is the average rainfall of all states that have actual rainfall of 600 mm or less in 2019 and have a negative deviation from LPA?
(a) 460 mm
(b) 500 mm
(c) 450 mm
(d) 367 mm

38. The LPA of a state for a year is defined as the average rainfall in the preceding 10 years considering the period of June-August. For example, LPA in 2018 is the average rainfall during 2009-2018 and LPA in 2019 is the average rainfall during 2010-2019. It is also observed that the actual rainfall in Gujarat in 2019 is 20% more than the rainfall in 2009. The LPA of Gujarat in 2019 is closest to
(a) 505 mm
(b) 525 mm
(c) 490 mm
(d) 475 mm

Answer the following questions based on the information given below.

The first-year students in a business school are split into six sections. In 2019 the Business Statistics course was taught in these six sections by Annie, Beti, Chetan, Dave, Esha, and Fakir. All six sections had a common midterm (MT) and a common endterm (ET) worth 100 marks each. ET contained more questions than MT. Questions for MT and ET were prepared collectively by the six faculty members. Considering MT and ET together, each faculty member prepared the same number of questions. Each of MT and ET had at least four questions that were worth 5 marks, at least three questions that were worth 10 marks, and at least two questions that were worth 15 marks. In both MT and ET, all the 5-mark questions preceded the 10-mark questions, and all the 15- mark questions followed the 10-mark questions.

The following additional facts are known.
1. Annie prepared the fifth question for both MT and ET. For MT, this question carried 5 marks.
2. Annie prepared one question for MT. Every other faculty member prepared more than one questions for MT.
3. All questions prepared by a faculty member appeared consecutively in MT as well as ET
4. Chetan prepared the third question in both MT and ET; and Esha prepared the eighth question in both.
5. Fakir prepared the first question of MT and the last one in ET. Dave prepared the last question of MT and the first one in ET.

39. The second question in ET was prepared by:
   (a) Beti   (b) Esha
   (c) Chetan   (d) Dave

40. How many 5-mark questions were there in MT and ET combined?
   (a) 13   (b) 10
   (c) 12   (d) Cannot be determined

41. Who prepared 15-mark questions for MT and ET?

   (a) Only Dave, Esha and Fakir
   (b) Only Beti, Dave, Esha and Fakir
   (c) Only Dave and Fakir
   (d) Only Esha and Fakir

42. Which of the following questions did Beti prepare in ET?
   (a) Tenth question   (b) Fourth question
   (c) Seventh question   (d) Ninth question

Answer the following questions based on the information given below.
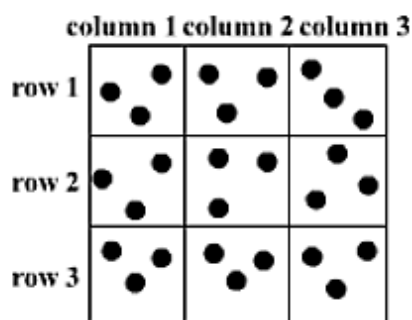
	Column 1	Column 2	Column 3
row 1	(2, 4)	(6, 8)	(1, 3)
row 2	(3, 5)	(1, 1)	(6, 20)
row 3	(1, 2)	(1, 2)	(2, 5)

Three pouches (each represented by a filled circle) are kept in each of the nine slots in a 3 × 3 grid, as shown in the figure. Every pouch has a certain number of one-rupee coins. The minimum and maximum amounts of money (in rupees) among the three pouches in each of the nine slots are given in the table. For example, we know that among the three pouches kept in the second column of the first row, the minimum amount in a pouch is Rs. 6 and the maximum amount is Rs. 8. There are nine pouches in any of the three columns, as well as in any of the three rows. It is known that the average amount of money (in rupees) kept in the nine pouches in any column or in any row is an integer. It is also known that the total amount of money kept in the three pouches in the first column of the third row is Rs. 4.

43. What is the total amount of money (in rupees) in the three pouches kept in the first column of the second row?

44. How many pouches contain exactly one coin?

45. What is the number of slots for which the average amount (in rupees) of its three pouches is an integer?

46. The number of slots for which the total amount in its three pouches strictly exceeds Rs. 10 is:

Answer the following questions based on the information given below.
In the table below the check marks indicate all languages spoken by five people: Paula, Quentin, Robert, Sally and Terence. For example, Paula speaks only Chinese and English.

	Arabic	Basque	Chinese	Dutch	English	French
Paula			✓		✓	
Quentin				✓	✓	
Robert	✓					✓
Sally		✓			✓	
Terence			✓			✓

These five people form three teams, Team 1, Team 2 and Team 3. Each team has either 2 or 3 members. A team is said to speak a particular language if at least one of its members speak that language.
The following facts are known.
(1) Each team speaks exactly four languages and has the same number of members.
(2) English and Chinese are spoken by all three teams, Basque and French by exactly two teams and the other languages by exactly one team.
(3) None of the teams include both Quentin and Robert.
(4) Paula and Sally are together in exactly two teams.
(5) Robert is in Team 1 and Quentin is in Team 3.

47. Who among the following four is not a member of Team 2?
   (a) Quentin
(b) Paula
    (c) Terence
(d) Sally

48. Who among the following four people is a part of exactly two teams?
(a) Sally   (b) Paula
(c) Quentin   (d) Robert

49. Who among the five people is a member of all teams?
(a) Terence   (b) Paula
(c) No one   (d) Sally

50. Apart from Chinese and English, which languages are spoken by Team 1?
(a) Basque and French   (b) Arabic and French
(c) Arabic and Basque   (d) Basque and Dutch

Answer the following questions based on the information given below.

A large store has only three departments, Clothing, Produce, and Electronics. The following figure shows the percentages of revenue and cost from the three departments for the years 2016, 2017 and 2018. The dotted lines depict percentage levels. So for example, in 2016, 50% of store's revenue came from its Electronics department while 40% of its costs were incurred in the Produce department.
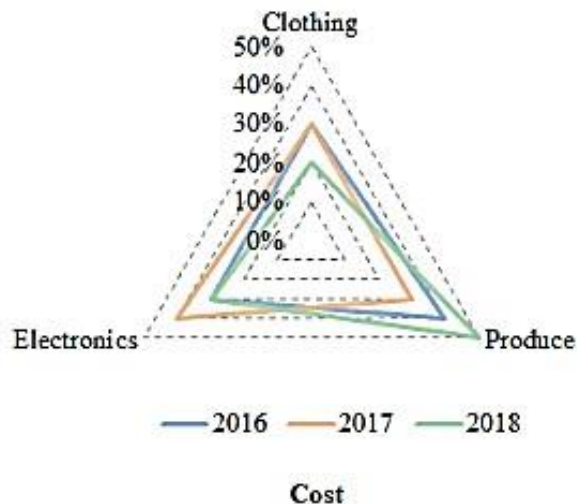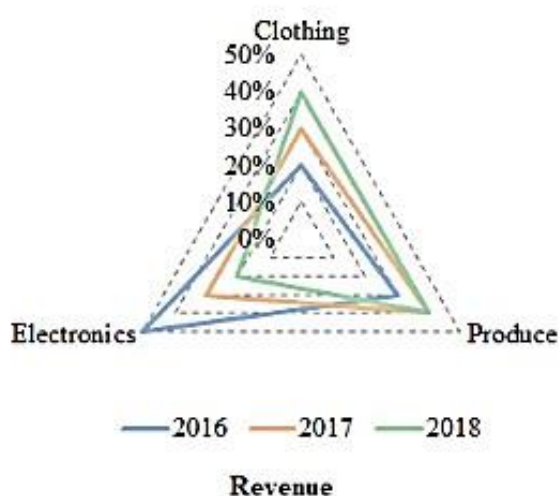
In this setup, Profit is computed as (Revenue – Cost) and Percentage Profit as Profit/Cost × 100%.
It is known that
1. The percentage profit for the store in 2016 was 100%.
2. The store's revenue doubled from 2016 to 2017, and its cost doubled from 2016 to 2018.
3. There was no profit from the Electronics department in 2017.
4. In 2018, the revenue from the Clothing department was the same as the cost incurred in the Produce department.

51. What was the ratio of revenue generated from the Produce department in 2017 to that in 2018?
    (a) 4 : 3   (b) 8 : 5
    (c) 16 : 9   (d) 9 : 16

52. What was the percentage profit of the store in 2018?

53. What percentage of the total profits for the store in 2016 was from the Electronics department?

54. What was the approximate difference in profit percentages of the store in 2017 and 2018?
    (a) 25.0   (b) 33.3
    (c) 8.3   (d) 15.5

Answer the following questions based on the information given below.

Ten players, as listed in the table below, participated in a rifle shooting competition comprising of 10 rounds. Each round had 6 participants. Players numbered 1 through 6 participated in Round 1, players 2 through 7 in Round 2,..., players 5 through 10 in Round 5, players 6 through 10 and 1 in Round 6, players 7 through 10, 1 and 2 in Round 7 and so on. The top three performances in each round were awarded 7, 3 and 1 points respectively. There were no ties in any of the 10 rounds. The table below gives the total number of points obtained by the 10 players after Round 6 and Round 10.

Player No.	Player Name	Points after Round 6	Points after Round 10
1	Amita	8	18
2	Bala	2	5
3	Chen	3	6
4	David	6	6
5	Eric	3	10
6	Fatima	10	10
7	Gordon	17	17
8	Hansa	1	4
9	Ikea	2	17
10	Joshin	14	17

The following information is known about Rounds 1 through 6:
1. Gordon did not score consecutively in any two rounds.
2. Eric and Fatima both scored in a round.
The following information is known about Rounds 7 through 10:
1. Only two players scored in three consecutive rounds. One of them was Chen. No other player scored in any two consecutive rounds.
2. Joshin scored in Round 7, while Amita scored in Round 10.
3. No player scored in all the four rounds.

55. What were the scores of Chen, David, and Eric respectively after Round 3?
(a) 3, 0, 3
(b) 3, 3, 0
(c) 3, 3, 3
(d) 3, 6, 3

56. Which three players were in the last three positions after Round 4?
(a) Bala, Ikea, Joshin
(b) Bala, Hansa, Ikea
(c) Bala, Chen, Gordon
(d) Hansa, Ikea, Joshin

57. Which player scored points in maximum number of rounds?
(a) Ikea
(b) Chen
(c) Amita
(d) Joshin

58. Which players scored points in the last round?
(a) Amita, Chen, David
(b) Amita, Bala, Chen
(c) Amita, Chen, Eric
(d) Amita, Eric, Joshin

Answer the following questions based on the information given below.

Students in a college are discussing two proposals –
A: a proposal by the authorities to introduce dress code on campus, and
B: a proposal by the students to allow multinational food franchises to set up outlets on college campus.
A student does not necessarily support either of the two proposals.
In an upcoming election for student union president, there are two candidates in fray: Sunita and Ragini. Every student prefers one of the two candidates.

A survey was conducted among the students by picking a sample of 500 students. The following information was noted from this survey.
1. 250 students supported proposal A and 250 students supported proposal B.
2. Among the 200 students who preferred Sunita as student union president, 80% supported proposal A.
3. Among those who preferred Ragini, 30% supported proposal A.
4. 20% of those who supported proposal B preferred Sunita.
5. 40% of those who did not support proposal B preferred Ragini.
6. Every student who preferred Sunita and supported proposal B also supported proposal A.
7. Among those who preferred Ragini, 20% did not support any of the proposals.

59. What percentage of the students surveyed who supported both proposals A and B preferred Sunita as student union president?
(a) 50
(b) 25
(c) 40
(d) 20

60. Among the students surveyed who supported proposal A, what percentage preferred Sunita for student union president?

	Sunita	Ragini
Only proposal A	k	p
Only proposal B	l	q
Both A and B	m	r
Neither A nor B	n	s
	Sunita	Ragini
Only proposal A	110	40
Only proposal B	0	150
Both A and B	50	50
Neither A nor B	40	60

61. What percentage of the students surveyed who did not support proposal A preferred Ragini as student union president?

	Sunita	Ragini
Only proposal A	k	p
Only proposal B	l	q
Both A and B	m	r
Neither A nor B	n	s
	Sunita	Ragini
Only proposal A	110	40
Only proposal B	0	150
Both A and B	50	50
Neither A nor B	40	60

(a) 200   (b) 40
(c) 150   (d) 210

62. How many of the students surveyed supported proposal B, did not support proposal A and preferred Ragini as student union president?

Answer the following questions based on the information given below.

Three doctors, Dr. Ben, Dr. Kane and Dr. Wayne visit a particular clinic Monday to Saturday to see patients. Dr. Ben sees each patient for 10 minutes and charges Rs. 100/-. Dr. Kane sees each patient for 15 minutes and charges Rs. 200/-, while Dr. Wayne sees each patient for 25 minutes and charges Rs. 300/-.
The clinic has three rooms numbered 1, 2 and 3 which are assigned to the three doctors as per the following table.

Room No.	Monday & Tuesday	Wednesday & Thursday	Friday & Saturday
1	Ben	Wayne	Kane
2	Kane	Ben	Wayne
3	Wayne	Kane	Ben

The clinic is open from 9 a.m. to 11.30 a.m. every Monday to Saturday.
On arrival each patient is handed a numbered token indicating their position in the queue, starting with token number 1 every day. As soon as any doctor becomes free, the next patient in the queue enters that emptied room for consultation. If at any time, more than one room is free then the waiting patient enters the room with the smallest number. For example, if the next two patients in the queue have token numbers 7 and 8 and if rooms numbered 1 and 3 are free, then patient with token number 7 enters room number 1 and patient with token number 8 enters room number 3.

63. What is the maximum number of patients that the clinic can cater to on any single day?
(a) 31   (b) 15
(c) 30   (d) 12

64. The queue is never empty on one particular Saturday. Which of the three doctors would earn the maximum amount in consultation charges on the day?
(a) Dr. Wayne
(b) Dr. Kane
(c) Both Dr. Wayne and Dr. Kane
(d) Dr. Ben

65. Mr. Singh visited the clinic on Monday, Wednesday, and Friday of a particular week, arriving at 8:50 a.m. on each of the three days. His token number was 13 on all three days. On which day was he at the clinic for the maximum duration?
(a) Wednesday
(b) Monday
(c) Friday
(d) Same duration on all three days

66. On a slow Thursday, only two patients are waiting at 9 a.m. After that two patients keep arriving at exact 15 minute intervals starting at 9:15 a.m. -- i.e at 9:15 a.m., 9:30 a.m., 9:45 a.m. etc. Then the total duration in minutes when all three doctors are simultaneously free is
(a) 0   (b) 30
(c) 10   (d) 15

67. The real root of the equation $2^{5x} + 2^{3x+2} - 21 = 0$ is
(a) $\frac{log_2(3)}{3}$
(b) $log_2 9$
(c) $\frac{log_2(7)}{3}$
(d) $log_2 27$

68. The average of 30 integers is 5. Among these 30 integers, there are exactly 20 which do not exceed 5. What is the highest possible value of the average of these 20 integers?
(a) 4
(b) 5
(c) 4.5
(d) 3.5

69. Let a, b, x, y be real numbers such that $a^2 + b^2$ = 25, $x^2 + y^2$ =169 and ax+by = 65. If k = ay - bx, then
(a) k=0
(b) k > 513
(c) k=513
(d) 0 <k ≤513

70. In a triangle ABC, medians AD and BE are perpendicular to each other, and have lengths 12 cm and 9 cm, respectively. Then, the area of triangle ABC, in sq cm, is
(a) 80
(b) 68
(c) 72
(d) 78

71. Let a_1, a_2 be integers such that $a_1 - a_2 + a_3 - a_4 + \cdots + (-1)^{n-1}a_n = n$, for n ≥1. Then $a_{s1} + a_{s2} + \cdots + a_{1023}$ equals
(a) -1
(b) 1
(c) 0
(d) 10

72. How many factors of $2^4 \times 3^5 \times 10^4$ are perfect squares which are greater than 1?

73. Two circles, each of radius 4 cm, touch externally. Each of these two circles is touched externally by a third circle. If these three circles have a common tangent, then the radius of the third circle, in cm, is
(a) π/3
(b) 1
(c) $1/\sqrt{2}$
(d) $\sqrt{2}$

74. What is the largest positive integer such that $\frac{(N^2+7N+12)}{(N^2-N-12)}$ is also positive integer?
(a) 6
(b) 8
(c) 16
(d) 12

75. In 2010, a library contained a total of 11500 books in two categories - fiction and non-fiction. In 2015, the library contained a total of 12760 books in these two categories. During this period, there was 10% increase in the fiction category while there was 12% increase in the non-fiction category. How any fiction books were in the library in 2015?

(a) 6600
(b) 6160
(c) 6000
(d) 5500

76. Let f be a function such that f(mn) = f(m) x f(n) for every positive integers m and n. If f(1), f(2) and f(3) are positive integers, f(1) < f(2), and (24) = 54, then f(18) equals

77. Let A and B be two regular polygons having a and b sides, respectively. If b = 2a and each interior angle of B is 3/2 times each interior angle of A, then each interior angle, in degrees, of a regular polygon with a + b sides is

78. A cyclist leaves A at 10 am and reaches B at 11 am. Starting from 10:01 am, every minute a motorcycle leaves A and moves towards B. Forty-five such motorcycles reach B by 11 am. All motorcycles have the same speed. If the cyclist had doubled his speed, how many motorcycles would have reached B by the time the cyclist reached B?
(a) 22
(b) 20
(c) 15
(d) 23

79. Let A be a real number. Then the roots of the equation x^2 - 4x - log2A = 0 are real and distinct if and only if
(a) A< 1/16
(b) A<1/8
(c) A>1/8
(d) A> 1/16

80. John jogs on track A at 6 kmph and Mary jogs on track B at 7.5 kmph. The total length of tracks A and B is 325 metres. While John makes 9 rounds of track A, Mary makes 5 rounds of track B. In how many seconds will Mary make one round of track A?

81. Anil alone can do a job in 20 days while Sunil alone can do it in 40 days. Anil starts the job, and after 3 days, Sunil joins him. Again, after a few more days, Bimal joins them and they together finish the job. If Bimal has done 10% of the job, then in how many days was the job done?
(a) 13
(b) 12
(c) 15
(d) 14

82. In an examination, Rama's score was one-twelfth of the sum of the scores of Mohan and Anjali. After a review, the score of each of them increased by 6. The revised scores of Anjali, Mohan, and Rama were in the ratio 11: 10 : 3. Then Anjali's score exceeded Rama's score by
(a) 26
(b) 32
(c) 24
(d) 35

83. In an examination, the score of A was 10% less than that of B, the score of B was 25% more than that of C, and the score of C was 20% less than that of D. If A scored 72, then the score of D was

84. The base of a regular pyramid is a square and each of the other four sides is an equilateral triangle, length of each side being 20 cm. The vertical height of the pyramid, in cm, is
   (a) $10\sqrt{2}$ (b) $8\sqrt{3}$
   (c) 12   (d) $5\sqrt{5}$

85. If x is a real number, then log, $\sqrt{\log_e \left(\frac{4x-x^2}{3}\right)}$ is a real number if and only if
   (a) -3<xx<3   (b) 1<xx<2
   (c) 1<x<3   (d) -1<x<3

86. Let ABC be a right-angled triangle with hypotenuse BC of length 20 cm. If AP is perpendicular on BC, then the maximum possible length of AP, in cm, is
   (a) 10   (b) $8\sqrt{2}$
   (c) $6\sqrt{2}$ (d) 5

87. Two ants A and B start from a point P on a circle at the same time, with A moving clock-wise and B moving anti-clockwise. They meet for the first time at 10:00 am when A has covered 60% of the track. If A returns to P at 10:12 am, then B returns to P at
   (a) 10:27 am   (b) 10:25 am
   (c) 10:45 am   (d) 10:18 am

88. How many pairs (m,n) of positive integers satisfy the equation $m^2 + 105 = n^2$?

89. The salaries of Ramesh, Ganesh and Rajesh were in the ratio 6 : 5:7 in 2010, and in the ratio 3 : 4 : 3 in 2015. If Ramesh's salary increased by 25% during 2010-2015, then the percentage increase in Rajesh's salary during this period is closest to
   (a) 7   (b) 8
   (c) 9   (d) 10

90. A man makes complete use of 405 cc of iron, 783 cc of aluminium, and 351 cc of copper to make a number of solid right circular cylinders of each type of metal. These cylinders have the same volume and each of these has radius 3 cm. If the total number of cylinders is to be kept at a minimum, then the total surface area of all these cylinders, in sq cm, is:
   (a) 1044(4+π)   (b) 8464π
   (c) 928 π   (d) 1026(1 + π)

91. The quadratic equation x^2+ bx + ¢ = 0 has two roots 4a and 3a, where a is an integer. Which of the following is a possible value of $b^2 + c$.
   (a) 3721   (b) 549
   (c) 361   (d) 427

92. In a six-digit number, the sixth, that is, the rightmost, digit is the sum of the first three digits, the fifth digit is the sum of first two digits, the third digit is equal to the first digit, the second digit is twice the first digit and the fourth digit is the sum of fifth and sixth digits. Then, the largest possible value of the fourth digit is

93. Mukesh purchased 10 bicycles in 2017, all at the same price. He sold six of these at a profit of 25% and the remaining four at a loss of 25%. If he made a total profit of Rs. 2000, then his purchase price of a bicycle, in Rupees, was
   (a) 2000   (b) 6000
   (c) 8000   (d) 4000

94. The number of common terms in the two sequences: 15, 19, 23, 27, ... ,415 and 14, 19, 24, 29, ... ,464 is:
   (a) 20   (b) 18
   (c) 21   (d) 19

95. If 2n+1) + 2n+3) + 2n+5) +.....+ 2n+47) = 5280, then what is the valueof 1 +2 + 3 +.....+ n?

96. The strength of a salt solution is p% if 100 ml of the solution contains p grams of salt. Each of three vessels A, B, C contains 500 ml of salt solution of strengths 10%, 22%, and 32%, respectively. Now, 100 ml of the solution in vessel A is transferred to vessel B. Then, 100 ml of the solution in vessel B is transferred to vessel C. Finally, 100 ml of the solution in vessel C is transferred to vessel A. The strength, in percentage, of the resulting solution in vessel A is:
   (a) 15   (b) 12
   (c) 13   (d) 14

97. If $5^x - 3^y = 13438$ and $5^{x-1} + 3^{y+1} = 9686$, then x + y equals

98. Amal invests Rs 12000 at 8% interest, compounded annually, and Rs 10000 at 6% interest, compounded semi-annually, both investments being for one year. Bimal invests his money at 7.5% simple interest for one year. If Amal and Bimal get the same amount of interest, then the amount, in Rupees, invested by Bimal is

99. A shopkeeper sells two tables, each procured at cost price p, to Amal and Asim at a profit of 20% and at a loss of 20%, respectively. Amal sells his table to Bimal

at a profit of 30%, while Asim sells his table to Barun at a loss of 30%. If the amounts paid by Bimal and Barun are x and y, respectively, then (x -y)/ p equals

(a) 1   (b) 1.2

(c) 0.7   (d) 0.5

100. John gets Rs 57 per hour of regular work and Rs 114 per hour of overtime work. He works altogether 172 hours and his income from overtime hours is 15% of his income from regular hours. Then, for how many hours did he work overtime?

VERBAL ABILITY AND READING COMPREHENSION

1. **(a)** Its important to understand the meaning of the term 'digital colonization' with respect to the passage. After a clear understanding of the passage, we know it revolves around 'who should own the copyrights'. Since its mentioned as critics point of view in the passage. Hence its about countries where these sites are located but these countries not owning the rights to the scanned images. Hence Option 1 is the correct one. Option 4 is similar in meaning but it does not take into account the fact that only if you own the copyrights you can give permission for the same. Hence, the correct answer is option 1.

2. **(b)** While answering this question is important to note that we are looking for the right analogy that is in sync with the part of owning the copyright, with respect to it being your entity but someone else owning the rights for the same. In this case, Option 2 where Egyptian artefacts are actually owned by the Western museum. Other options don't provide the correct analogy with respect to owning the entity and owning the rights for the same, and hence are incorrect. Hence, the correct answer is option 2.

3. **(c)** Students must ensure that they read Option 4 correctly, Watrall nowhere mentions that he is against the 'technology' of Google, but it's about the intention of Google. He is no way trying to portray that the images should not be available to common people. Now between 2 and 3 it's important to understand the meaning of words to eliminate answer choices, now Option 3 is a better pick because Watrall's only guessed the actual usage of these pictures by Google, there is no certainty about this. Hence, the correct answer is option 3.

4. **(a)** From the line "these images belong on the site of a museum" we can clearly understand that we need to look for an answer that invalidates Dr Watrall's objection. This is only possible if Option 1 is true.
Hence, the correct answer is option 1.

5. **(c)** Its important to understand all the points that Google and CyArk have put forth in their defense. To answer this question, we should look for options that these two companies will definitely not agree on. According to this, Option 3 will prove to be some sort of a dictatorship analogy and hence cannot be chosen by the companies. Protector of a culture may not be the same as a promoter of culture and hence the correct answer is 3. Hence, the correct answer is option 3.

6. **(a)** This question highlights the dilemma presented in the second last paragraph, to pick small towns or go for larger cities. Now after understanding this, lets eliminate options, Option 2 is straight away rejected because it does not mention the two options, similarly you can eliminate option 4. Now option 3 is out of scope since it does not mention anything that has been conveyed in the passage. Option 1 is the correct answer since its on similar lines as the dilemma mentioned in the passage.
Hence, the correct answer is option 1.

7. **(a)** This question requires a prior vocabulary knowledge. 'Pedigree' means history, so a long pedigree means having a long history, hence only option 1 seems as the right option.
Hence, the correct answer is option 1.

8. **(b)** In this question, we already know the author's viewpoint that relocating government agencies have not always been a success, so we need to look for an option which is not one of the reasons. Corruption has been mentioned towards the end of the passage. Difficulty in attracting talent and staff loses is also mentioned in the passage. However, Option 2 is not stated as a reason and hence has to be the correct answer option.
Hence, the correct answer is option 2.

9. **(a)** This question can be answered through reading the first paragraph. The passage mentions coastal capitals picked by trade-focused empires were spurned, hence we know that colonial powers were focused on trade. Hence, the correct answer is option

10. **(b)** When the question mentions least likely, we need to choose an answer that would not be used by people who support decentralizing of central government functions. So out of all the options we need to look for those which are in support and the ones which are against. Cost factor and salaries has been discussed as in the passage, hence it supports decentralization. Autonomy and new ideas are mentioned in the second paragraph hence we can eliminate option 1 and 3 as well. Option 2 is not given as a support point of decentralization; hence it is the correct answer choice. Hence, the correct answer is option 2.

11. **(d)** This question also requires some hold on vocabulary, 'marginality' means to consider something as insignificant or not important. Now the colonial state was marginalized because it was at the periphery of the Indian society, so the colonial state here refers to the small ruling elite. Even if we try to answer the question only through our understanding of the word marginalize, we can see that besides option 4, no other option captures the correct essence of the meaning. Hence, the correct answer is option

12. **(a)** This question can be answered by understanding the first paragraph itself. We can infer all the options except Option 1. The idea for experimental sites is given in paragraph 1, similarly, we can infer enlightenment rationalism as the motivation behind the change in colonial policy. If we read the sentence "It had restructured everything in Europe…" we can infer Option 3 as well. So we have evidence for Options 2,3 and 4. Now let's look at why Option 1 cannot be inferred. It's important to read the Option carefully and understand ⊃ Solution Discuss Report how different it is from the actual passage. It did face resistance, but this resistance was not from modernity but from existing structural reforms, hence Option cannot be inferred and is the correct answer Option. Hence, the correct answer is option 1.

13. **(a)** It's crucial for students to know the meaning of the word Endogenous to answer this question correctly. It means having an internal cause or origin. In answer Option 4, a new term Endogamous is used which has a different meaning, it means having a marriage within a specific type, so this Option has to be eliminated. Similarly, 2 and 3 also

do not make sense given the meaning of Endogenous. In Option 1, since the word 'organically' has been used it has a relation with origin, hence this is the correct answer choice. Hence, the correct answer is option 1.

14. **(a)** The points mentioned in the passage will be in support of the author's argument, anything besides that will have to be the correct answer here. The author mentions historians who have proposed that Capitalism in India was not introduced with any modifications, hence this is in support of the author. The author also mentions that colonies were experimental labs so Option 4 is also not the correct choice. Towards the end of the passage, the author says that because modernity was externally imposed, the underdeveloped became developed, hence Option 2 is eliminated as well. Now between Option 3 and Option 1, Option 1 is the correct choice because the framing of the sentence is incorrect. Hence, the correct answer is option 1.

15. **(d)** In the passage, the author talks about the development of underdeveloped, and the opening of the passage is through the mention of British colonial policy. Hence clearly Option 4 is the correct choice.
Hence, the correct answer is option 4.

16. **(d)** In the third paragraph, it is mentioned that Calthorpe's statement "The city is the most environmentally benign..." so we need to look for an answer that is opposite to what he has said. because what people believe in and what Calthorpe has to say are contradictory in nature. In Option 2, the idea of crowdedness is out of context, so can be eliminated. Option 1 is too broad. Option 3 is also out of context. Hence the correct answer has to be option 4 because it captures the idea that is opposite of Calthrope's views and in line with the general public. Hence, the correct answer is option 4.

17. **(b)** This question requires a basic understanding of what will be the environment efficient option, now 3 and 4 can be eliminated because obviously being energy efficient and recycling will help the environment tremendously. Now between sorting garbage and keep streets clean, sorting garbage will have a better impact on the environment and is also mentioned in the passage.
Hence, the correct answer is option 2.

18. **(c)** With the example of Manaus towards the end of the passage, we can easily eliminate the Options 1 and 2 because we can infer that cities help create jobs and they prevent destruction of environment. The cultural transformation part has been mentioned in the passage and hence Option 4 can be eliminated as well. It can be misleading, because we might feel Option 3 can also be deduced, but it's important to understand this option in depth to point out the differences. Hence, the correct answer is option 3.

19. **(d)** The question talks about greenness hence we need to focus on only that part, with this and through elimination technique, we can get the answer. Option 1 and 3 are out of context and hence can be easily eliminated. Because as per Option 1 is increasing CO2, the idea of greenness does not make any sense. And in Option 3, there is a mention of 'violent crimes' which has no link to greenness. Now in Option 2 the high cost of utilities, also has no relation to the greenness. Hence, the correct answer is option 4.

20. **(c)** It's important to understand the context in which the author discusses Manaus. The answer revolves around stopping deforestation. In the passage when we read the last paragraph, we can eliminate Options 2 and 4. Now between 1 and 3, 3 highlights that the purpose of giving jobs is to stop deforestation. Hence this has to be the correct choice. Hence, the correct answer is option 3.

21. **(c)** We need to pick an answer that has a connect with language's ability to change us. In case of Option 3, there is absolutely no link with this, hence this is the correct answer. The line "My identity as a white male..." justifies Option 1, hence it can be eliminated. The third last paragraph clearly mentions Option 4 and Option 2. Hence, the correct answer is option 3.

22. **(b)** You will need to understand and analyze the passage well to get this question right, it's on the difficult side because you cannot get the answer directly in the passage. Throughout the passage we get an understanding that the author is in favor of people learning new languages and breaking cultural barriers. In case of Option 2, a French ethnographer learning the culture of a Nigerian tribe, is in sync with what the author says in the entire passage. Hence, the correct answer is option 2.

23. **(a)** Orientalism is used here in the context of identity. The author mentions that language breaks all the cultural barriers. Option 1 is correct because it includes learning another language so it is in line with what the author keeps mentioning. Option 4 is eliminated because goodwill and globalization have no link. Option 2 does not make use of the word Orientalism in context of the passage. Hence, the correct answer is option 1.

24. **(a)** Here Option 2 will be in support of the author's main argument and hence cannot be the correct answer. We need to look for an answer that is contrary to what the author is saying in the passage. This is possible only through Option 1. Option 4 is out of context, and Option 3 has no link with language. Hence, the correct answer is option 1.

25. **(2431)** This is a difficult question and we need to closely analyze each sentence to form the correct sequence. Now after reading all the four sentences, we know 2 and 4 will form a mandatory pair, since both of them talk about 'objects'. Now 3 and 1 form a pair, if we think about it, the structure and order mentioned in sentence 3, is further elaborated in sentence 1. Now we need to see which pair will start the sequence. Between 31 and 24, 24 is a better starter. Hence the correct answer is 2431.

26. **(4132)** Clearly, sentence 4 has to start the sequence because it introduces the concept of clock-time. Next we see a mandatory pair of sentences 1 and 3, because exploring conceptualizations of gendered times, mentioned in 3 is an elaboration of the conceptualization mentioned in sentence 1. Sentence 2 hence acts as a conclusion. Hence, the correct answer is 4132.

27. **(2143)** After reading the four sentences, we know sentences 3 and 4 cannot start the sequence because they make use of conjunctions which connote that some other sentence must be preceded in this. Now because sentence 4 uses 'however' the sentence before that has to have a contradictory idea, this idea is present in 1, hence we have 1 and 4 as the mandatory pair in this order. Now in sentence 1 we see 'your tune may change', this tune is in reference to what is mentioned in sentence 1. Hence the order becomes 143. So 2 has to start the sequence. Hence, the correct answer is 2143.

28. (2) We might feel that all the sentences are connected after the first read and hence this question might seem difficult. If we try to order the sentences first to get the odd one out, we know the sequence starter would either be sentence 1 or 2. Between both of them sentence 1 seems a better pick. Hence we get the sequence 1345 by using parajumble rules. Sentence 2 mentions that the creator is participating, which is not the case keeping in mind the rest of the sentences, hence sentence 2 is the odd one out. Hence, the correct answer is 2.

29. (2) Sentence 5 and 3 form a pair, because they both talk about retention of plastic particles and clogging of digestive tracts. Now 5 is related to 1, because in 1 the author talks about marine animals consuming plastic, this acts as an introduction to 5. So 153 becomes a pair. Now 4 will act as an introductory sentence to the entire sequence, thereby forming the sequence of 4153. So sentence 2 becomes the odd one out. Hence, the correct answer is 2

30. (d) The passage mentions that language is a human trait and not a derived trait, hence Option 2 can be eliminated. Option 1 misses on the part of language drawing on aspects of cognition as memory, hence cannot be correct. Option 3 does not include the part of language evolving with time, and hence is not the right choice. Option 4 covers all the aspects and hence is the correct answer. Hence, the correct answer is option is 4.

31. (a) The passage highlights that it's easier for hybrid organizations to attract people as compared to non-hybrid organizations. Option 2 does not even mention hybrid organizations and hence can be eliminated. Option 4 is only providing the example of 9/11 and hence cannot be the right choice for summary. Option 3 also makes use of attraction of people as an example, hence cannot be the right choice. Option 1 has to be the correct choice. Hence, the correct answer is option 1.

32. (3421) This is an easy question; we can easily pick sentence 3 as the correct sentence starter. Other sentences either include conjunctions or words which require sentences to be preceded. Now sentences 4 and 2 form a mandatory pair, since the 'parts' mentioned in 4 are further elaborated in sentence 2. So we get the sequence as 3421. Hence, the correct answer is 3421.

33. (1) We should first try to arrange the sentences to get the odd one out. Sentence 4 introduces the concept of rumination, hence has to start the sequence, this has to be followed by sentence 3 which mentions the risk which people are at because of rumination. And according to a similar logic we can form the pair of sentences 2 and 5, since we can see a change in perspective. So the correct order is 4325, which leaves sentence 1 as the odd one out. Hence, the correct answer is 1.

34. (c) Here Option 3 becomes the best choice because, after reading the passage well, we know it comprises of two parts, one being the dismantling of the walls and the other of the result in relation to selfish business interest. Option 2 can be eliminated because satisfaction of workers is not a direct link to the passage. Option 1 is not the right choice because the passage revolves around the intention of companies. Option 4 is incorrect because it ignores the labour point which is important in relation to the passage. Hence, the correct answer is option 3.

DATA INTERPRETATION AND LOGICAL REASONING

35. (d) There are a total of 7 states which have actual rainfall greater than or equal to 900 mm.
Out of these only 3 have negative deviation. (Arunachal, Kerela and Meghalaya)
Required percentage = (3/7) × 100 ≈ 42.86%.
Hence, option (d).

36. (c) There are 9 states whose actual rainfall is less than or equal to 750 mm.
The states arranged according to the deviation is: Gujarat (25%), Karnataka(20%), Rajasthan(15%), MP(10%), Assam(−10%), WB(−30%),
Jharkhand(−35%), Delhi(−40%) and Manipur(−60%).
So the median deviation is of Assam (−10%).
Hence, option (c).

37. (a) There are five states who have actual rainfall of 600 mm or less in 2019 and have a negative deviation from LPA [Assam(600). WB(600),
Jharkhand (400), Manipur (400) and Delhi (300).
Required average = (600 + 600 + 400 + 400 + 300)/5 = 460 mm.
Hence, option (a).

38. (c) Actual rainfall in Gujarat in 2019 is 20% more than the rainfall in 2009.
So, considering Gujarat, Actual rainfall in 2019 = (6/5) × Actual rainfall in 2009 = 600 mm (given).
∴ Actual rainfall in 2009 = 500 mm.
As deviation for Gujarat is 25%, so average rainfall for 2009 to 2018 is 600/1.25 = 480 mm.
So, total rainfall from 2009 to 2018 = 480 × 10 = 4800 mm.
LPA for 2019 = (Rainfall in 2010 to 2019)/10 = [(Rainfall in 2009 to 2018) − Rainfall in 2009 + Rainfall in 2019]/10
= (4800 − 500 + 600)/10 = 490 mm.
Hence, option (c).

39. (d) Each of MT and ET had at least four questions that were worth 5 marks, at least three questions that were worth 10 marks, and at least
two questions that were worth 15 marks. In both MT and ET, all the 5-mark questions preceded the 10-mark questions, and all the 15-
mark questions followed the 10-mark questions.
Therefore, Each of MT and ET had at least 4 + 3 + 2 = 9 questions. Also, these 9 questions were worth 80 marks. So, remaining 20
marks can be from (one 5-mark and one 15-mark questions OR two 10-mark questions OR two 5-mark questions and one 10-mark
question OR four 5-mark questions).
From (ii), Annie prepared exactly one question (i.e., fifth question) for MT and minimum number of questions in MT = 1 + 5 × 5 = 11
From (iv) and (v), Fakir and Chetan prepared the first and the third questions respectively. Now from (ii) and (iii), Fakir and Chetan
prepared the second and the fourth questions also.
Similarly it can be concluded that Dave prepared first two questions of ET and Chetan prepared the third and the fourth questions of
ET.

Also, as each faculty member prepared the same number of questions and Chetan prepared 4 questions, each prepared 4 questions.

Total number of questions in ET and MT together = 4 × 6 = 24. As ET contained more questions than MT, MT had 11 questions and ET
had 13 questions.

Therefore, Beti (6th and 7th), Esha (8th and 9th) and Dave (10th and 11th) prepared exactly two questions for MT. Also, first five
questions were of 5 marks, then three 10-mark questions and in the last, three 15- mark questions. As ET has 13 questions and 9
among these contribute to 80 marks, we are left with the possibility that there were four 5-mark questions other than the 9 questions.

Annie prepared 3 questions for ET (i.e., the 5th, 6th and 7th). Esha prepared 8th and 9th questions. And Fakir prepared last two
questions. Thus, we have

Q.No.	ET	MT
1	Dave (5-mark)	Fakir(5-mark)
2	Dave(5-mark)	Fakir(5-mark)
3	Chetan(5-mark)	Chetan(5-mark)
4	Chetan(5-mark)	Chetan(5-mark)
5	Annie(5-mark)	Annie(5-mark)
6	Annie(5-mark)	Beti(10-mark)
7	Annie(5-mark)	Beti(10-mark)
8	Esha(5-mark)	Esha(10-mark)
9	Esha(10-mark)	Esha(15-mark)
10	Beti(10-mark)	Dave(15-mark)
11	Beti(10-mark)	Dave(15-mark)
12	Fakir(15-mark)	
13	Fakir(15-mark)	

So, The second question in ET was prepared by Dave.
Hence, option (d).

40. (a) Each of MT and ET had at least four questions that were worth 5 marks, at least three questions that were worth 10 marks, and at least
two questions that were worth 15 marks. In both MT and ET, all the 5-mark questions preceded the 10-mark questions, and all the 15-
mark questions followed the 10-mark questions.

Therefore, Each of MT and ET had at least 4 + 3 + 2 = 9 questions. Also, these 9 questions were worth 80 marks. So, remaining 20
marks can be from (one 5-mark and one 15-mark questions OR two 10-mark questions OR two 5-mark questions and one 10-mark
question OR four 5-mark questions).

From (ii), Annie prepared exactly one question (i.e., fifth question) for MT and minimum number of questions in MT = 1 + 5 × 5 = 11

From (iv) and (v), Fakir and Chetan prepared the first and the third questions respectively. Now from (ii) and (iii), Fakir and Chetan
prepared the second and the fourth questions also.

Similarly it can be concluded that Dave prepared first two questions of ET and Chetan prepared the third and the fourth questions of
ET.

There were eight 5-mark questions in ET and five 5-mark questions in MT.
Thus, there were 13 (5-mark) questions in MT and ET combined.
Hence, option (a).

41. (a) Each of MT and ET had at least four questions that were worth 5 marks, at least three questions that were worth 10 marks, and at least
two questions that were worth 15 marks. In both MT and ET, all the 5-mark questions preceded the 10-mark questions, and all the 15-
mark questions followed the 10-mark questions.

Therefore, Each of MT and ET had at least 4 + 3 + 2 = 9 questions. Also, these 9 questions were worth 80 marks. So, remaining 20
marks can be from (one 5-mark and one 15-mark questions OR two 10-mark questions OR two 5-mark questions and one 10-mark
question OR four 5-mark questions).

From (ii), Annie prepared exactly one question (i.e., fifth question) for MT and minimum number of questions in MT = 1 + 5 × 5 = 11

From (iv) and (v), Fakir and Chetan prepared the first and the third questions respectively. Now from (ii) and (iii), Fakir and Chetan
prepared the second and the fourth questions also.

Similarly it can be concluded that Dave prepared first two questions of ET and Chetan prepared the third and the fourth questions of ET.

Also, as each faculty member prepared the same number of questions and Chetan prepared 4 questions, each prepared 4 questions.

Total number of questions in ET and MT together = 4 × 6 = 24. As ET contained more questions than MT, MT had 11 questions and ET had 13 questions.

Therefore, Beti (6th and 7th), Esha (8th and 9th) and Dave (10th and 11th) prepared exactly two questions for MT. Also, first five questions were of 5 marks, then three 10-mark questions and in the last, three 15- mark questions. As ET has 13 questions and 9 among these contribute to 80 marks, we are left with the possibility that there were four 5-mark questions other than the 9 questions.

Annie prepared 3 questions for ET (i.e., the 5th, 6th and 7th). Esha prepared 8th and 9th questions. And Fakir prepared last two questions. Thus, we have

Q.No.	ET	MT
1	Dave (5-mark)	Fakir(5-mark)
2	Dave(5-mark)	Fakir(5-mark)
3	Chetan(5-mark)	Chetan(5-mark)
4	Chetan(5-mark)	Chetan(5-mark)
5	Annie(5-mark)	Annie(5-mark)
6	Annie(5-mark)	Beti(10-mark)
7	Annie(5-mark)	Beti(10-mark)
8	Esha(5-mark)	Esha(10-mark)
9	Esha(10-mark)	Esha(15-mark)
10	Beti(10-mark)	Dave(15-mark)
11	Beti(10-mark)	Dave(15-mark)
12	Fakir(15-mark)	
13	Fakir(15-mark)	

Only Esha and Dave prepared 15-mark questions for MT while Fakir prepared 15-mark questions for ET.
Hence, option (a)

42. **(a)** Each of MT and ET had at least four questions that were worth 5 marks, at least three questions that were worth 10 marks, and at least two questions that were worth 15 marks. In both MT and ET, all the 5-mark questions preceded the 10-mark questions, and all the 15-mark questions followed the 10-mark questions.

Therefore, Each of MT and ET had at least 4 + 3 + 2 = 9 questions. Also, these 9 questions were worth 80 marks. So, remaining 20 marks can be from (one 5-mark and one 15-mark questions OR two 10-mark questions OR two 5-mark questions and one 10-mark question OR four 5-mark questions).

From (ii), Annie prepared exactly one question (i.e., fifth question) for MT and minimum number of questions in MT = 1 + 5 × 5 = 11

From (iv) and (v), Fakir and Chetan prepared the first and the third questions respectively. Now from (ii) and (iii), Fakir and Chetan prepared the second and the fourth questions also.

Similarly it can be concluded that Dave prepared first two questions of ET and Chetan prepared the third and the fourth questions of ET.

Also, as each faculty member prepared the same number of questions and Chetan prepared 4 questions, each prepared 4 questions.

Total number of questions in ET and MT together = 4 × 6 = 24. As ET contained more questions than MT, MT had 11 questions and ET had 13 questions.

Therefore, Beti (6th and 7th), Esha (8th and 9th) and Dave (10th and 11th) prepared exactly two questions for MT. Also, first five questions were of 5 marks, then three 10-mark questions and in the last, three 15- mark questions. As ET has 13 questions and 9 among these contribute to 80 marks, we are left with the possibility that there were four 5-mark questions other than the 9 questions.

Annie prepared 3 questions for ET (i.e., the 5th, 6th and 7th). Esha prepared 8th and 9th questions. And Fakir prepared last two questions. Thus, we have

Q.No.	ET	MT
1	Dave (5-mark)	Faklr(5-mark)
2	Dave(5-mark)	Fakir(5-mark)
3	Chetan(5-mark)	Chetan(5-mark)
4	Chetan(5-mark)	Chetan(5-mark)
5	Annie(5-mark)	Annie(5-mark)
6	Annie(5-mark)	Beti(10-mark)
7	Annie(5-mark)	Beti(10-mark)
8	Esha(5-mark)	Esha(10-mark)
9	Esha(10-mark)	Esha(15-mark)
10	Beti(10-mark)	Dave(15-mark)
11	Beti(10-mark)	Dave(15-mark)
12	Fakir(15-mark)	
13	Fakir(15-mark)	

Beti prepared 10th and 11th question in ET.
Hence, option (a).

43. **(13)** Consider C1R1: Maximum coins in a pouch = 4 and minimum coins = 2. The third bag could have 2, 3 or 4 coins. Therefore, sum = 8, 9 or 10

Consider C1R2: Maximum coins in a pouch = 5 and minimum coins = 3. The third bag could have 3, 4 or 5 coins. Therefore, sum = 11, 12 or 13

Solution Discuss Report

Consider C1 R3: Maximum coins in a pouch = 2 and minimum coins = 1. As the sum = 4, third pouch has 1 coin. As the sum of coins in the nine pouches in the column are divisible by 9, the coins in C1R1 and C1R2 has to be 10 (i.e., 2, 4, 4) and 13 (i.e., 3, 5, 5) respectively.

Consider column 2:

C2R1: Maximum coins in a pouch = 8 and minimum coins = 6. The third bag could have 6, 7 or 8 coins. Therefore, sum = 20, 21 or 22

C2R2: All the three pouches have one coin each. Sum = 3

C2R3: Maximum coins in a pouch = 2 and minimum coins = 1. The third bag could have 1 or 2 coins. Therefore, sum = 1 or 4

In order to have number of coins in the cells of the column divisible by 9, sum of the coins in C2R1 = 20(i.e., 6, 6, 8) and in C2R3 = 4(i.e., 1,1,2)

Now consider R1

First two cells together have 30 coins. So the third cell has to have 6(i.e., 1, 2, 3) coins.

Consider R2: First two cells together have 16 coins. Coins in the third cell are in the range 6 + 6 + 20 = 32 to 6 + 20 + 20 = 46.

Therefore, the third cell has to have 38 (i.e., 6, 12, 20) coins.

Consider R3: First two cells together have 8 coins. So the third cell has to have 10 (i.e., 2, 3, 5) coins.

Thus, we have

	Column 1	Column 2	Column 3
row 1	(2,4,4)	(6,6,8)	(1,2,3)
row 2	(3,5,5)	(1,1,1)	(6,12,20)
row 3	(1,1,2)	(1,1,2)	(2,3,5)

First column of the second row has 13 coins. i.e., Rs. 13

Answer: 13

44. **(8)** Consider C1R1: Maximum coins in a pouch = 4 and minimum coins = 2. The third bag could have 2, 3 or 4 coins. Therefore, sum = 8, 9 or 10

Consider C1R2: Maximum coins in a pouch = 5 and minimum coins = 3. The third bag could have 3, 4 or 5 coins. Therefore, sum = 11, 12 or 13

Consider C1 R3: Maximum coins in a pouch = 2 and minimum coins = 1. As the sum = 4, third pouch has 1 coin. As the sum of coins in the nine pouches in the column are divisible by 9, the coins in C1R1 and C1R2 has to be 10 (i.e., 2, 4, 4) and 13 (i.e., 3, 5, 5) respectively.

Consider column 2:

C2R1: Maximum coins in a pouch = 8 and minimum coins = 6. The third bag could have 6, 7 or 8 coins. Therefore, sum = 20, 21 or 22

C2R2: All the three pouches have one coin each. Sum = 3

C2R3: Maximum coins in a pouch = 2 and minimum coins = 1. The third bag could have 1 or 2 coins. Therefore, sum = 1 or 4

In order to have number of coins in the cells of the column divisible by 9, sum of the coins in C2R1 = 20(i.e., 6, 6, 8) and in C2R3 = 4(i.e., 1,1,2)

Now consider R1

First two cells together have 30 coins. So the third cell has to have 6(i.e., 1, 2, 3) coins.

Consider R2: First two cells together have 16 coins. Coins in the third cell are in the range 6 + 6 + 20 = 32 to 6 + 20 + 20 = 46.

Therefore the third cell has to have 38 (i.e., 6, 12, 20) coins.

Consider R3: First two cells together have 8 coins. So the third cell has to have 10 (i.e., 2, 3, 5) coins.

Thus, we have

	Column 1	Column 2	Column 3
row 1	(2,4,4)	(6,6,8)	(1,2,3)
row 2	(3,5,5)	(1,1,1)	(6,12,20)
row 3	(1,1,2)	(1,1,2)	(2,3,5)

Two pouches in Row 3 Column 1 slot have 1 coin each.
Three pouches in Row 2 Column 2 have 1 coin each.
Two pouches in Row 3 Column 3 slot have 1 coin each.
One pouch in Row 1 Column 3 slot has 1 coin.
Total number of pouches = 2 + 3 + 2 + 1 = 8
Answer: 8

45. **(b)** Consider C1R1: Maximum coins in a pouch = 4 and minimum coins = 2. The third bag could have 2, 3 or 4 coins. Therefore, sum = 8, 9 or 10

Consider C1R2: Maximum coins in a pouch = 5 and minimum coins = 3. The third bag could have 3, 4 or 5 coins. Therefore, sum = 11, 12 or 13

Consider C1 R3: Maximum coins in a pouch = 2 and minimum coins = 1. As the sum = 4, third pouch has 1 coin.
Solution Discuss Report

As the sum of coins in the nine pouches in the column are divisible by 9, the coins in C1R1 and C1R2 has to be 10 (i.e., 2, 4, 4) and 13 (i.e., 3, 5, 5) respectively.

Consider column 2:

C2R1: Maximum coins in a pouch = 8 and minimum coins = 6. The third bag could have 6, 7 or 8 coins. Therefore, sum = 20, 21 or 22

C2R2: All the three pouches have one coin each. Sum = 3

C2R3: Maximum coins in a pouch = 2 and minimum coins = 1. The third bag could have 1 or 2 coins. Therefore, sum = 1 or 4

In order to have number of coins in the cells of the column divisible by 9, sum of the coins in C2R1 = 20(i.e., 6, 6, 8) and in C2R3 = 4(i.e., 1,1,2)

Now consider R1

First two cells together have 30 coins. So the third cell has to have 6(i.e., 1, 2, 3) coins.

Consider R2: First two cells together have 16 coins. Coins in the third cell are in the range 6 + 6 + 20 = 32 to 6 + 20 + 20 = 46.

Therefore the third cell has to have 38 (i.e., 6, 12, 20) coins.

Consider R3: First two cells together have 8 coins. So the third cell has to have 10 (i.e., 2, 3, 5) coins.

Thus, we have

	Column 1	Column 2	Column 3
row 1	(2,4,4)	(6,6,8)	(1,2,3)
row 2	(3,5,5)	(1,1,1)	(6,12,20)
row 3	(1,1,2)	(1,1,2)	(2,3,5)

For average amount to be an integer, we need to consider slots having total number of coins in the pouches divisible by 3.

There are two such slot i.e., (row 1 column 3) and (row 2 column 2).

Answer: 2.

46. (3) Consider C1R1: Maximum coins in a pouch = 4 and minimum coins = 2. The third bag could have 2, 3 or 4 coins. Therefore, sum = 8, 9 or 10

Consider C1R2: Maximum coins in a pouch = 5 and minimum coins = 3. The third bag could have 3, 4 or 5 coins. Therefore, sum = 11, 12 or 13

Consider C1 R3: Maximum coins in a pouch = 2 and minimum coins = 1. As the sum = 4, third pouch has 1 coin. As the sum of coins in the nine pouches in the column are divisible by 9, the coins in C1R1 and C1R2 has to be 10 (i.e., 2, 4, 4) and 13 (i.e., 3, 5, 5) respectively.

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Consider column 2:

C2R1: Maximum coins in a pouch = 8 and minimum coins = 6. The third bag could have 6, 7 or 8 coins. Therefore, sum = 20, 21 or 22

C2R2: All the three pouches have one coin each. Sum = 3

C2R3: Maximum coins in a pouch = 2 and minimum coins = 1. The third bag could have 1 or 2 coins. Therefore, sum = 1 or 4

In order to have number of coins in the cells of the column divisible by 9, sum of the coins in C2R1 = 20(i.e., 6, 6, 8) and in C2R3 = 4(i.e., 1,1,2)

Now consider R1

First two cells together have 30 coins. So the third cell has to have 6(i.e., 1, 2, 3) coins.

Consider R2: First two cells together have 16 coins. Coins in the third cell are in the range 6 + 6 + 20 = 32 to 6 + 20 + 20 = 46.

Therefore, the third cell has to have 38 (i.e., 6, 12, 20) coins.

Consider R3: First two cells together have 8 coins. So the third cell has to have 10 (i.e., 2, 3, 5) coins.

Thus, we have

	Column 1	Column 2	Column 3
row 1	(2,4,4)	(6,6,8)	(1,2,3)
row 2	(3,5,5)	(1,1,1)	(6,12,20)
row 3	(1,1,2)	(1,1,2)	(2,3,5)

The slots for which the total amount in its three pouches strictly exceeds Rs. 10 are Row 1 Column 2, Row 2 Column 1, Row 2 Column 3.

Answer: 3.

47. (a) Robert is in Team 1 and speaks Arabic and French.

So, from (1) and (2); Team 1 speaks English, Chinese, Arabic and French.

So, Sally cannot be in Team 1. As Arabic is spoken by exactly one team, Robert is only on Team 1.

Therefore from (4), Paula and Sally are in Teams 2 and 3.

Quentin is in Team 3 and speaks Dutch and English.

So, from (1) and (2); Team 3 speaks English, Chinese, Dutch and Basque. Also, Paula, Sally and Quentin are members of Team 3.

As Dutch is spoken by exactly one team, Quentin is only on Team 3. Team 3 has exactly 3 members.

Therefore from (1), each team has 3 members. So, Terence is the third member of Team 1 and 2.

Therefore, we have

Teams	Languages	Members
Team 1	English, Chinese, French, Arabic	Paula, Terence, Robert
Team 2	English, Chinese, French, Basque	Paula, Sally, Terence
Team 3	English, Chinese, Dutch, Basque	Paula, Sally, Quentin

So, Quentin is not a member of Team 2.

Hence, option (a).

48. (a) Consider the solution to first question of this set. Quentin and Robert are members of exactly one team while Paula is a member of all the three teams. Sally is a part of exactly two teams.

Hence, option (a).

49. (b) Consider the solution to first question of this set. Paula is a member of all teams.

Hence, option (b).

50. (b) Consider the solution to first question of this set. Apart from Chinese and English, Team 1 speaks Arabic and French.

Hence, option (b).

51. (b)

Department	Revenue %			Cost %		
	2016	2017	2018	2016	2017	2018
Electronics	50	30	20	30	40	30
Clothing	20	30	40	30	30	20
Produce	30	40	40	40	30	50

Let the total cost of the store in 2016 be 100.
From (1): Total revenue in 2016 = 2 × Total cost in 2016 = 2 × 100 = 200.
From (2): Total revenue in 2017 = 2 × Total revenue in 2016 = 2 × 200 = 400.
From (2): Total cost in 2018 = 2 × Total cost in 2016 = 2 × 100 = 200.
So, we can find the department wise revenue in 2016 and 2017 and cost in 2016 and 2018 using the percentages found from the radar graph.

Department	Revenue			Cost			Profit		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Electronics	100	120		30		60	70		
Clothing	40	120		30		40	10		
Produce	60	160		40		100	20		
Total	200	400		100		200	100		

From (3): Cost from Electronics in 2017 = Revenue from Electronics in 2017 = 120.
So total cost in 2017 = 120/40% = 300. And hence the department wise costs can be found for 2017.
From (4): Revenue from Clothing department in 2018 = Cost for the Produce departement in 2018 = 100.
So total revenue in 2018 = 100/40% = 250.

Department	Revenue			Cost			Profit		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Electronics	100	120	50	30	120	60	70	0	-10
Clothing	40	120	100	30	90	40	10	30	60
Produce	60	160	100	40	90	100	20	70	0
Total	200	400	250	100	300	200	100	100	50

Revenue generated from the Produce department in 2017 to that in 2018 = 160 : 100 = 8 : 5.
Hence option (b).

52. (25) Consider the solution to first question of this set.
Required percentage = (Profit/Cost) × 100 = (50/200) × 100 = 25%.
Hence, 25.

53. (70) Consider the solution to first question of this set.
Total profit in 2016 = 100.
Profit from Electronics in 2016 = 70
Required percentage = (70/100) × 100 = 70%.

Hence, 70.

54. (c) Consider the solution to first question of this set.
Solution Discuss Report
Profit percentage of the store;
In 2017 = (100/300) × 100 = 33.33%.
In 2018 = (50/200) × 100 = 25%.
Required difference = 33.33 – 25 = 8.33 ≈ 8.3.
Hence option (c).

55. (c) 0020As the top three performances in each round were awarded 7, 3 and 1 respectively, remaining all performances were awarded 0 points.
Amita was participant in round 1 and in rounds 6 through 10.
So, in all she scored 8(= 1 + 7) points in round 1 and round 6. Also, she scored 10 points in rounds 7 through 10 together.
Bala was participant in rounds 1 and 2 and also in rounds 7 through 10.
As he scored 2 points in first two rounds, he must have scored 1 point in each of the two rounds. He scored 3(= 3 or 1+1+1) points in rounds 7 through 10.
Chen scored 3 points in first three rounds and as he scored in three consecutive rounds among 7 through 10, he must have scored 1 point each in round 8, 9 and 10.
David scored 6 points in first four rounds together and 0 (i.e., 6 – 6) each in 9th and 10th rounds.
Eric scored 3(= 3 or 1+1+1) points in five rounds together and hence 10 – 3 = 7 points in the 10th round.
Gordon scored 17 points in rounds 2 through 6 together and hence, 17 – 17 = 0 points in the 7th round.
As he did not scored consecutively in any two rounds, he must have scored 0 in 3rd and 5th round and 7, 7, and 3 points in 2nd, 4th and 6th rounds, not necessarily in the given sequence.
Hansa scored 1 point in one of the rounds 3-6. So, she must have scored 4 – 1 = 3 points in either 7th or 8th rounds.
Ikea scored 2 points in 4th, 5th and 6th rounds together. Therefore, remaining 15 points must have been scored in 7th, 8th and 9th round in some order.
As Chen scored 1 point in the 8th and 9th round, Ikea must have scored 1 point in 7th round and 7 points each in the 8th and 9th round.

Joshin scored 14 points in 5th and 6th rounds. So, he scored 7 points in each of 5th and 6th rounds.

Now we need to decide about remaining 3 points in the last four rounds.

As Joshin scored in round 7, and Chen has scored 1 point in each of the last three rounds, Joshin must have scored all 3 points in the 7th round and 0 points in the last three rounds.

Therefore, we can tabulate this information as

Player No.	Player Name	1	2	3	4	5	6	7	8	9	10
1	Amita		NA	NA	NA	NA					
2	Bala	1	1	NA	NA	NA	NA				
3	Chen				NA	NA	NA	NA	1	1	1
4	David					NA	NA	NA	NA	9	0
5	Eric						NA	NA	NA	NA	7
6	Fatima							NA	NA	NA	NA
7	Gordon	NA		0		0		0	NA	NA	NA
8	Hansa	NA	NA							NA	NA
9	Ikea	NA	NA	NA				1	7	7	NA
10	Joshin	NA	NA	NA	NA	7	7	3	0	0	0

As Joshin scored 3 points in the 7th round, Hansa must have scored 3 in 8th round and 0 in the 7th round. Now consider 7th round.

Only Amita must have scored 7 in the 7th round.

As she has scored in round 10, the remaining 3 points she must have scored in round 10. Thus, we can now conclude that Bala scored 3

points in the 9th round.

As Joshin scored 7 points in the 6th round Amita must have scored 1 point in this round and hence7 points in the first round.

Gordon scored 7, 7 and 3 points in 2nd, 4th and 6th rounds. Joshin scored 7 points in the 6th round so, Gordon scored 7, 7 and 3 points in 2nd, 4th and 6th rounds respectively.

So, we can fill remaining values as 0 in the table for the 6th round.

Thus, Ikea scored 1 point each in 4th and 5th rounds. And hence, Hansa scored 1 point in the 3rd round.

So far we have entered values 1 and 7 for all the rounds. Now we have to enter 3 points of each of Bala, Chen, David and Fatima and 7

points for Fatima.

Eric and Fatima both scored in a round. This is possible only when Fatima scored 7 points and Eric scored 3 points. This must be round

3.

No one other than Fatima scored 3 points in round 5. Similarly, David scored 3 points in the 4th round. Chen and David scored 3 points

in 1st and 2nd round in some order.

Thus, we have

Player No.	Player Name	1	2	3	4	5	6	7	8	9	10
1	Amita	7	×	×	×	×	1	7	-	-	3
2	Bala	1	1	×	×	×	×	-	-	3	-
3	Chen	0/3	3/0	-	×	×	×	×	1	1	1
4	David	3/0	0/3	-	3	×	×	×	×	-	-
5	Eric	-	-	3	-	-	×	×	×	×	7
6	Fatima	-	-	7	-	3	-	×	×	×	×
7	Gordon	×	7	-	7	-	3	-	×	×	×
8	Hansa	x	×	1	-	-	-	-	3	×	×
9	Ikea	x	x	×	1	1	-	1	7	7	×
10	Joshin	×	×	×	×	7	7	3	-	-	-

After round 3, the scores of Chen, David and Eric were 3, 3, 3.

Hence, option (c).

56. (d) Consider the solution to first question of this set.

The three players in the last position after Round 4 were Hansa, Ikea and Joshin.

Hence, option (d).

57. (a) Consider the solution to first question of this set.

Ikea scored in maximum number of rounds i.e., in 5 rounds.

Hence, option (a).

58. (c) Consider the solution to first question of this set.

Amita, Chen and Eric scored in the last round.

Hence, option (c).

59. (a)

	Sunita	Ragini
Only proposal A	k	p
Only proposal B	l	q
Both A and B	m	r
Neither A nor B	n	s

From (1), k + m + p + r = 250 and l + m + q + r = 250

From (4), l + m = 0.2 × 250 = 50
From (6), l = 0 ⇒ m = 50
∴ q + r = 200
From (2), k + l + m + n = 200 and hence p + q + r + s = 300
From (3), p + r = 0.3 × 300 = 90 ⇒ k + m = 160
As l = 0 and k + l + m + n = 200, n = 40
∴ k = 110
From (7), n + s = 100 ⇒ s = 60
∴ p + q + r = 240 and p + r = 90 ⇒ q = 150
∴ q + r = 200 ⇒ r = 50 and hence p = 40
Thus, we have

	Sunita	Ragini
Only proposal A	110	40
Only proposal B	0	150
Both A and B	50	50
Neither A nor B	40	60

Out of 100 students who supported both proposals A and B, 50 students preferred Sunita as student union president. i.e., 50%

60. (64) From (1), k + m + p + r = 250 and l + m + q + r = 250
From (4), l + m = 0.2 × 250 = 50
From (6), l = 0 ⇒ m = 50
∴ q + r = 200
Sunita Ragini
Only proposal A k p
Only proposal B l q
Both A and B m r
Neither A nor B n s
Sunita Ragini
Only proposal A 110 40
Only proposal B 0 150
Both A and B 50 50
Neither A nor B 40 60
Solution Discuss Report
From (2), k + l + m + n = 200 and hence p + q + r + s = 300
From (3), p + r = 0.3 × 300 = 90 ⇒ k + m = 160
As l = 0 and k + l + m + n = 200, n = 40
∴ k = 110
From (7), n + s = 100 ⇒ s = 60
∴ p + q + r = 240 and p + r = 90 ⇒ q = 150
∴ q + r = 200 ⇒ r = 50 and hence p = 40
Thus, we have
Among 250 students who supported proposal A, 110 + 50 = 160 students preferred Sunita for student union president which is
equivalent to 64%.
Answer: 64.

61. (84) From (1), k + m + p + r = 250 and l + m + q + r = 250
From (4), l + m = 0.2 × 250 = 50
From (6), l = 0 ⇒ m = 50
∴ q + r = 200
From (2), k + l + m + n = 200 and hence p + q + r + s = 300
From (3), p + r = 0.3 × 300 = 90 ⇒ k + m = 160
As l = 0 and k + l + m + n = 200, n = 40
∴ k = 110
From (7), n + s = 100 ⇒ s = 60
∴ p + q + r = 240 and p + r = 90 ⇒ q = 150
∴ q + r = 200 ⇒ r = 50 and hence p = 40
Thus, we have

250 students did not support proposal A. Out of these, 150 + 60 = 210 students preferred Ragini as student union president, which is
equivalent to 84%

62. (c)

	Sunita	Ragini
Only proposal A	k	p
Only proposal B	l	q
Both A and B	m	r
Neither A nor B	n	s

From (1), k + m + p + r = 250 and l + m + q + r = 250
From (4), l + m = 0.2 × 250 = 50
From (6), l = 0 ⇒ m = 50
∴ q + r = 200
From (2), k + l + m + n = 200 and hence p + q + r + s = 300
From (3), p + r = 0.3 × 300 = 90 ⇒ k + m = 160
As l = 0 and k + l + m + n = 200, n = 40
∴ k = 110
From (7), n + s = 100 ⇒ s = 60
∴ p + q + r = 240 and p + r = 90 ⇒ q = 150
∴ q + r = 200 ⇒ r = 50 and hence p = 40
Thus, we have

	Sunita	Ragini
Only proposal A	110	40
Only proposal B	0	150
Both A and B	50	50
Neither A nor B	40	60

Out of 250 students who supported proposal B, 150 did not support proposal A and preferred Ragini as student union president.
Hence, option (c).

63. (a) The clinic is open from 9 a.m. to 11:30 a.m. i.e., for 150 minutes.
In these 150 minutes, Dr. Ben can see 15 patients, Dr Kale can see 10 patients and Dr Wayne can see 6 patients.
Thus, the clinic can cater to 15 + 10 + 6 = 31 patients.
Hence, option (a).

64. (b) The clinic is open from 9 a.m. to 11:30 a.m. i.e., for 150 minutes.
As the queue is never empty, in these 150 minutes, Dr. Ben can see 15 patients, Dr Kale can see 10 patients and Dr Wayne can see 6
patients and thereby earn Rs. 1,500, Rs. 2,000 and Rs. 1,800 respectively.
i.e. Dr. Kane earns the maximum amount in consultation charges on that day.
Solution Discuss Report
Hence, option (b).

65. (b) In first 50 minutes, Dr. Ben sees 5patients; Dr. Kane sees 3 patients and he must be with his four patients while Dr. Wayne sees 2
patients.
These must be first 11 patients. Now about patients with token numbers 12 and 13.
On Monday patient with token number 13 will go to Dr. Wayne, on Wednesday and Friday he will go to Dr. Ben.

Hence, on Monday, he will spend 10 + 50 + 25 = 85 minutes, while on the remaining two days, he will spend 10 + 50 + 10 = 70 minutes.

So, Mr. Singh was at the clinic for the maximum duration on Monday.

Hence, option (b).

66. (a) Patient with token no. 1 will be seen by Dr. Wayne for 25 minutes and that with token number 2 will be seen by Dr. Ben for 10 minutes.

Now the two patients those entered at 9:15 a.m were given tokens with numbers 3 and 4.

These will be seen by Dr. Ben and Dr. Kane respectively.

As Dr. Kane takes 15 minutes to examine one patient, he will be free at 9:30 am.

Thus, in first half an hour three doctors will not be simultaneously free.

This is true for duration of 30 minutes henceforth.

Thus, the total duration in minutes when all three doctors are simultaneously free will be 0.

QUANTITATIVE APTITUDE

67. (a) Given: $2^{5x} + 2^{3x+2} - 21 = 0$

Replace 2^{3x} with y

So, $2^{6x} = with\ y$

Now, $2^{5x} + 2^{3x+2} - 21 = 0$ can be rewritten as $y^2 + 2^2 \times 2^{3x} - 21 = 0$

$y^2 + 4y - 21 = 0$

Solving the above quadratic equation,

(y+7) (y-3)=0

So, y=-7 or +3

y = - 7 is rejected (since, y = 2^{3x} which should always be positive)

$= 2^{3x} = 3$

Taking log on both sides,

$log_2 3 = 3x$

$X = \frac{log_2(3)}{3}$

Hence, option (a).

68. (c) Exactly 20 of the 30 integers do not exceed 5 that means 10 of the 30 integers are greater than 5.

Sum of all 30 integers = 30 x 5 = 150.

To keep the average of the 20 integers as high as possible, we need to keep the average of the 10 integers above 5 as low as possible.

Since we are dealing with integers, the least value that the 10 integers above 5 can take is 6.

So, the sum of the 10 integers = 10 x 6 = 60.

Hence, the sum of the remaining 20 integers = 150 - 60 = 90. The average of the remaining 20 = 90/20 = 4.5

Hence, option (c).

69. (a) $a^2 + b^2 = 25$, $x^2 + y^2$ =169

We know $5^2 = 25$ and $13^2 = 169$

Multiply both equations to get $(a^2 + b^2)(x^2 + y^2) = 25 \times 169$

$(a^2 + b^2) \times (x^2 + y^2) = 4225$

We know, $4225 = 65^2$

We also know that ax + by = 65

So, numerically (Not algebraically),

$(a^2 + b^2) \times (x^2 + y^2) = (ax + by)^2$

Expanding the equation,

$= (ax)^2 + (ay)^2 + (bx)^2 + (by)^2 = (ax)^2 + (by)^2 + 2axby$

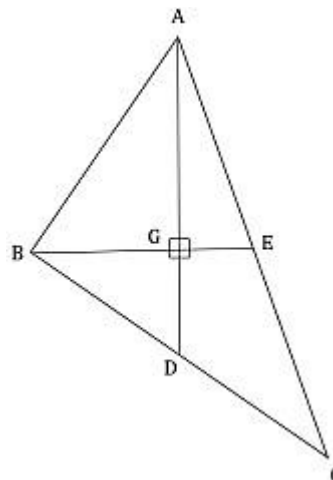$= (ay)^2 + (bx)^2 = 2axby$

$= (ay)^2 + (bx)^2 - 2axby = 0$

This is of the form, $(p - q)^2$

$(ay - bx)^2 = 0$

= ay – bx = 0=k

Hence, option (a).

70. (c)

As AD and BE are medians, so G is the centroid of AABC.

So, AG: GD =BG:GE=2:1.

∴ AG=8cm,GD =4 cm, BG =6 cm and GE = 3 cm.

If we join centroid with all 3 vertices, we get 3 triangles of equal areas.

∴ Area of AABC = 3 x Area of AABG

= Area of AABC =3 x (1/2 x 8 x 6) = 72 sq. cm.

Hence, option (a).

71. (b) $a_1 - a_2 + a_3 - a_4 + \cdots + (-1)^{n-1}a_n = n$

Put n=1 = a_1 = 1

Put n = 2 $a_1 - a_2$ = 2=a_2=1-2 = -1

Put n = 3 = $a_1 - a_2 + a_3$ = 3 = a_3 = 3 - 1 - 1 = 1

Hence, the series proceeds as 1, -1, 1, -1, …

i.e. odd term of the series = +1

& even terms of the series = -1

Then $a_{s1} + a_{s2} + \cdots + a_{1023} = 1 + (-1) + \cdots + 1$

$= a_{s1} + a_{52} + \cdots + a_{1023} = 1$

Hence, option (b).

72. (44) N = $2^4 \times 3^5 \times 10^4 = 2^4 \times 3^5 \times 2^4 \times 5^4 = 2^8 \times 3^5 \times 5^4$

Now, for any number to be a perfect square, it must have even powers.

So, if we consider 2^8, only powers of 0, 2, 4, 6, 8 can lead to perfect squares i.e. 5 ways

Now,

If we consider 3^5, only powers of 0, 2, 4 can lead to perfect squares i.e. 3 ways

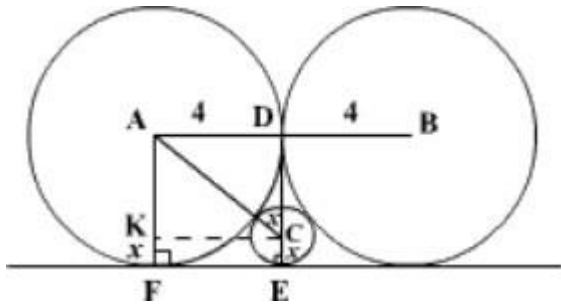If we consider 5^4, only powers of 0, 2, 4 can lead to perfect squares i.e. 3 ways

So, total number of possibilities = 5 x 3 x 3 ways = 45 ways.

Since we need to find the number of factors greater than 1,

Required number of ways = 45 -1 = 44 ways

Hence, 44.

73. (b) Let the radius of the third circle be x' cm.

AF=DE=4cm=AK=DC=(4-x)cm

In ΔADC, $AC^2 = AD^2 + DC^2$

$(4 + X)^2 = 4^2 + (4 - X)^2$

$\therefore$ x = 1.

Hence, option (a).

74. (d) Given: $\dfrac{(N^2+7N+12)}{(N^2-N-12)}$

$\dfrac{(N^2+7N+12)}{(N^2-N-12)} = \dfrac{(n^2+4n+3n+12)}{(n^2-4n+3n-12)} = \dfrac{(n+4)(n+3)}{(n-4)(n+3)}$

Now, n cannot be equal to -3, since denominator cannot be 0

$\dfrac{(N^2+7N+12)}{(N^2-N-12)} = \dfrac{(n+4)}{(n-4)} = \dfrac{(n-4+8)}{(n-4)} = 1 + \dfrac{8}{(n-4)}$

For $\dfrac{(N^2+7N+12)}{(N^2-N-12)}$ to be an integer, 8/(n-4) should also be an integer.

Largest value of n—4 = 8

largest possible value of n = 12.

Hence, option (d).

75. (a) In 2010 : Total books = 11500

Let the number of fiction books be f, non-fiction books will be (11500 - f)

In 2015 : Total books = 12760

Increase in total number of books = 12760 - 11500 = 1260

Fiction books increase by 10%, non-fiction books increase by 12%.

Hence, f x $\dfrac{10}{100}$ + (11500 − f) × $\dfrac{12}{100}$ = 1260

10f + 12 x 11500 — 12f = 126000

x = 6000 books

So, Fiction books in 2015, 6000 + 600 = 6600 books

Hence, option (a).

76. (12) f(mn) = f(m) x f(n)

(1), f(2) & f(3) are positive integers.

Now we know, f(24) = 54

So, f(2) x f(3) x f(4) = (2) x f(3) x f(2)^2 = 54

(3) x f(2)^3 = 54

Also, we know, 54 = 2 x 3^3

Therefore, f(2) = 3, $f(3)^2$ = 2

Now, f(18) = 3^2 x (2)

f(18) = 2^2 x3 = 12

Hence, 12.

77. (150) Sum of the interior angles of a n-sided Polygon = (n - 2) x 180

Measure of each interior angle = $\dfrac{(n-2)}{n}$ x 180°

So, Interior angle of the polygon with side a = $\dfrac{(a-2)}{a}$ x 180°

Interior angle of the polygon with side b = $\dfrac{(2a-2)}{2a}$ x 180°

It is given that interior angle of side b is 3/2 times to that of the polygon with side A

$= \dfrac{2a-2}{2a} \times 180° = \dfrac{3}{2}[\dfrac{(a-2)}{a} \times 180°]$

=(2a-2) x 180 =(3a-6) x 180

=2a-2=3a-6

=a=4 S0, b=28

Now, (a + b) sides = 8 + 4 = 12 sides

Interior angle = $\dfrac{12-2}{12}$x 180° = 150°

Hence, 150.

78. (c) It is given that the cyclist starts at 10:00 am from A and reaches B at 11:00 am

Now, Motorcyclists start every minute from 10:01 am, and 45 such motorcyclists reach B before 11:00 am

If they leave one by one every minute, the 45th motorcyclist would have left by 10:45 am to reach B at 11:00 am.

Thus, time taken by one motorcyclist to reach B from A = 15 minutes.

Now, the cyclist doubles his speed. This means, he reaches B at 10:30 am

So, the last motorcyclist should have left A by 10:15 am

Thus, 15 motorcyclists would have reached B by the time the cyclist reaches B

Hence, option (c).

79. (d) For roots of a quadratic equation to be real and distinct, Discriminant > 0

So, for x^2 — 4x — log2A = 0,

D= $(-4)^2 - (4 \times 1 \times (-log_2A)) > 0$

=16 +4 x log_2A> 0

=log_2A>-4

=A > 2^{-4}

= A>1/16

Hence, option (d).

80. (48) Let the track length for John be 'a' and for Mary be 'b'

So, Distance travelled by John = 9a

Distance travelled by Mary = 5b

Now, Time taken by John = 9a/6 hours

Time taken by Mary = 5b/7.5 hours

We know that Time taken by John = Time taken by Mary

= 9a/6 = 5b/7.5

=a =4b/9

Total track length = 325 meters

So, 4b/9 + b = 325 meters

= 13b/9 = 325 meters

=b = 225 meters

= a = 100 meters

Mary jogs at 7.5 Kmph = 7.5 x 5/18

So, time taken = $\dfrac{100}{(7.5 \times \frac{5}{18})}$ = 48 seconds.

Hence, 48.

81. (a) Anil in one day can do 1/20th of the work

Sunil in one day can do 1/40th of the work

Anil starts the job and Sunil joins him after three days.

So, Anil would have done 3/20 of the work by the time Sunil joins

After Sunil joins, they both would be doing 3/40th of work everyday

Now, it is known that Bimal joins them after some days and finishes 10% of the work (i.e. 1/10% of the work).

Now, Anil alone had done 3/20 of the work in first 3 days and Bimal completes 1/10% of the work

So, in total they would have done 3/20 + 1/10 = 1/4™ of the work.

Remaining work = 3/40th which would be done by Anil and Sunil together.

Anil and Sunil together comple $1/20^{th}$ + $1/40^{th}$ = 3/40% work in 1 day.

Hence, time taken by them to comple $3/4^{th}$ of the work = 10 days.

Combining everything,

Total number of days = 3 + 10 = 13 days.

Hence, option (a).

82. **(b)** It is given that the scores of Anjali, Mohan and Rama after review were in the ratio 11:10: 3

So, let their values be 11x, 10x and 3x respectively.

It is known that their score increased by 6 after review.

So, scores before review = 11x - 6, 10x - 6 and 3x - 6 respectively

Now, from the data given: (11x - 6 + 10x - 6) x 1/12 = 3x -6

=21x-12 =36x-72

= 60 = 15x

=2x=4

So, marks after revision are 44, 40 and 12 respectively.

Therefore, Anjali's score exceeded Rama's by 44 - 12 = 32 marks

Hence, option (b).

83. **(80)** Given: A scored 72

A's score was 10% less than B

So, Score of B = 72/0.9 = 80

We know that B was 25% more than C
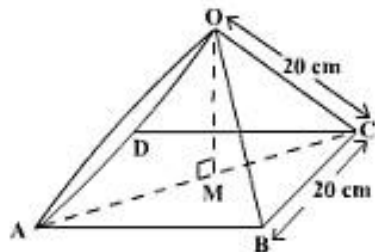
So, C x 5/4 =80 =C=64

Now, we know that C scored 20% less than D.

So, C=4/5xD

=64=4/5xD

=D = 80 marks

Hence, 80.

84. **(a)**

In the above image, the side length of the square is equal to the side length of the equilateral triangle.

So, AB = BC = OC = 20 cm.

AAOM is a right angled triangle with AMO = 90°, AO = 20 cm.

OM is the height of the pyramid.

AC is the diagonal of the square base, so AM = AC/2 = $(20\sqrt2)/2 = 10\sqrt2$.

So using pythagoras theorem; $OM^2 = AO^2 - AM^2 = 20^2 - (110\sqrt2)^2 = 400 - 200 = 200$

∴OM = $10\sqrt2$

Hence, option (b)

85. **(c)** It is given that $\sqrt{log_e\ (\frac{4x-x^2}{3})}$ is a real number

Therefore, $log_e\ (\frac{4x-x^2}{3}) \geq 0$

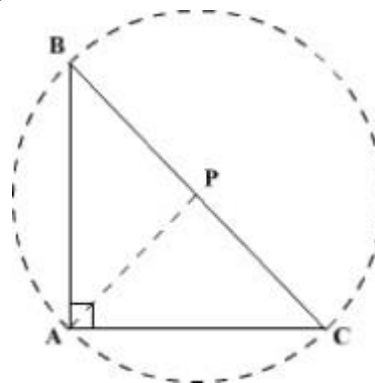=$\frac{4x-x^2}{3} \geq 1$

= 4x-$x^2 \geq 3$

= 4x-$x^2 \geq 3$

= $x^2 - 4x + 3 \leq 0$

= (x-1) (x-3) ≤ 0

= x ∈ [1,3]

Hence, option (c).

86. **(a)**

∠BAC = 90°, so BC can be considered diameter of a circle with center anywhere on BC.

AP is maximum when it is the perpendicular bisector from the vertex to the hypotenuse. So, BP = PC = 20/2 = 10. This implies that P is the center of the circle.

∴AP =BP =PC=10cm.

Hence, option (b).

87. **(a)** We are told that, by the time A and B meet for the first time, A covers 60% of the distance, while B covers 40% of the distance.

So, the speeds of A and B are in the ratio 60:40 or 3:2

Hence, the time they take to cover a particular distance will be in the ratio 2:3

We know that A covers 60% of the distance at 10:00 AM and covers 100% of the distance at 10:12 AM.

That means A takes 12 minutes to cover 40% of the track.

So to cover the entire track he must have taken 12 + 12 + 6 = 30 minutes.

(because 40% + 40% + 20% = 100%)

Since the time taken by A and B to complete the track are in the ratio 2:3, the time taken by B to complete the track will be 45 minutes.

At 10:00 AM, B has covered 40% of the track. If we can find out what time does B take to complete the remaining 60% of the track, we

can find the finish time of B.

Time required to complete 60% of the track = 60% of 45 = 27 minutes.

Hence, B complete one single round at 10:27 AM.

Hence, option (a).

88. **(4)** We know that $m^2 + 105 = n^2$

$105 = n^2 - m^2$

105=(+m) x (n-m)

105 can be written as 3 × 5 × 7, which can be written as product of two numbers in 4 ways i.e. (105 × 1), (35 × 3), (21 × 5), (15 × 7)

Solving each of these 4 cases will give corresponding values of m and n.

Hence, 4.

89. **(a)** The salaries of Ramesh, Ganesh and Rajesh were in the ratio 6: 5:7 in 2010

In 2010, let salary of Ramesh = 6x, Ganesh = 5x & Rajesh = 7x

In 2015, their salaries are in the ratio 3 : 4 : 3 respectively.

In 2015, let salary of Ramesh = 3y, Ganesh = 4y & Rajesh = 3y

Now, Ramesh''s salary increased by 25%

Hence, 3y = 5/4 x 6x

=y = 25x

∴ Rajesh's salary in 2015 = 3y = 3 x 2.5x = 7.5x

Percentage increase in Rajesh's salary during 2010 - 2015 = $\frac{7.5-7}{7}$ x 100% = 7.

Hence, option (a).

90. (d) As the total number of cylinders to be kept at a minimum, the volume of each cylinder must be maximum possible.

HCF (405, 783, 351) = 27 = Volume of each cylinder = 27 cc.

∴$\pi r^2 h$ = 27 (where r and h represent the radius and height of the cylinder)

Given that r = 3, so π h = 3.

Number of cylinders of;

Iron = 405/27 = 15.

Aluminium = 783/27 = 29.

Copper = 351/27 = 13.

∴Total number of cylinders = 15 + 29 + 13 = 57.

Total surface area of all the cylinders = 57 x [2πr2 + 2πrh]

Put r = 3 and π h = 3 to get;

Required surface area = 1026(1 + π) sq. cm.

Hence, option (d).

91. (b) Given quadratic equation is x^2 + bx + c= 0

Sum of roots = -b

=-b =4a+ 3a

=-b=7a

Product of the roots = ¢

=c=4ax 3a

=c=12a^2

Now, b^2 = 49a^2 and c =12a^2

Hence, b^2 + c = 49a2 + 12a°

=b^2+c=61a^2

Final answer must be a multiple of 61 & the multiple should be a perfect square.

Going through the options,

3721 = 61 x 61 (multiple is not a perfect square)

361 (not a multiple of 61)

427 = 61 x 7 (multiple is not a perfect square)

549 = 61 x 9=61x 3²

Thus, possible value of b^2 + c = 549.

Hence, option (b).

92. (7) Let the first digit be = a

Second digit = Twice of first digit = 2a

Third digit = First digit = a

Fifth digit = Sum of first two digits = a + 2a = 3a

Sixth digit = Sum of first three digits = a + 2a + a = 4a

Fourth digit = Sum of fifth and sixth digit = 3a + 4a = 7a

Largest possible value of fourth digit = 7 (it has to be a single digit integer)

Hence, 7.

93. (d) Let the cost price of one bicycle = Rs. x

Total cost price = Rs. 10x

He made a total profit of 25% on 6 cycles and 25% loss on 4 cycles and made a profit of Rs. 2000

So, 2000 = 6 x x/4 - 4 x x/4

2000 = x/2

x = Rs. 4000

Hence, option (d).

94. (a) First series - 15, 19, 23, 27,....., 415 = Common difference = 4

Second series - 14, 19, 24, 29,......, 464 = Common difference = 5

Common terms in both sequences = 19, 39, 59,...., (Common difference = LCM (4,5) = 20)

Now :

19, 39,59, .., =(20- 1), (40 -1), (60 -1),.... , (400-1) (There is no room for 419, as the first series ends at 415)

399 =400-1=20x20-1

Hence, the number of common terms in the two sequences = 20

Hence, option (a).

95. (4851) Given: 2n + 1) + 2n + 3) + 2n + 5) + .. + (2n + 47) = 5280

=2n+2n +... +2n) + (1 +3 +5 +... +47) =5280

Odd numbers from 1 to 47 are added in the above series.

n^{th} odd natural number = 2n - 1

∴ Number of terms from 1 to 47 = (47 + 1)/2 = 24 terms

∴ Given equation becomes 2n x 24 + (1 + 3 + 5 +..... + 47) = 5280

Sum of first n odd natural numbers = n'.

=2n x 24 + 24° = 5280

= 2n x 24 = 5280 - 24²

=2n=220-24²

=n=98

Hence, 1+ 2 + 3 +....+ 98 = $\frac{98 \times 99}{2}$ = 4851

Hence, 4851.

96. (d) Vessels A, B and C contains salt solution of strengths 10%, 22% and 32% respectively

It is also given that the amount of salt solution = 500 ml

So, Vessels A, B and C contains salt of 50 grams, 110 grams and 160 grams respectively

100 ml of Solution is transferred from A to B:

A would have 400 ml, B would have 600 ml of solution
Amount salt from A which is transferred to B = (Initial salt amount)/5 = 10 grams
So, Total salt in B = 110 + 10 = 120 grams (After first transfer)
Total salt in A = 40 grams (After first transfer)
Now, 100 ml from Vessel B is transferred to Vessel C
So similarly, 1/6th of salt would transfer from B to C
Total Salt in B = 120 - 20 = 100 grams (After second transfer)
Total Salt in C = 160 + 20 = 180 grams (After second transfer)
Now, 100 ml from Vessel C is transferred to Vessel A
So similarly, 1/6" of salt would transfer from C to A
Total Salt in C = 160 - 30 = 130 grams (After third transfer)
Total Salt in A = 40 + 30 = 70 grams (After third transfer)
So, Vessel A contains 70 grams Salt in 500 ml solution
Strength of Salt Solution in Vessel A = 14%
Hence, option (d).

97. **(13)** It is given that $5^x - 3^y$ = 13438 and $5^{x-1} + 3^{y+1}$ = 9686
Let 5^{x-1} =k and 3Y =m
So, 5k - m = 13538 (1
k + 3m = 9686 (2)
Multiply (1) with 3,
15k - 3m = 40314 ---- (3)
Adding (2) and (3) we get,
16k = 50000
K = 625× 5
K= 5^5
We know, 5^{x-1} = k
So, x-1=5
X=6
We know, k + 3m = 9686
3125 + 3m = 9686
3m = 6561
m= 2187
m=$3^7 = 3^y$
y=17
X+y=6+7=13
Hence, 13.

98. **(20920)** The amount on the first investment of Anmol = 12,000 x (1.08) = 12,960
So the Interest on this investment is 12,960 - 12,000 = 960.
The amount on the second investment of Anmol = 10,000 x (1.03)2 = 10,609
So the Interest on this investment is 10,609 - 10,000 = 609.
So the total interest on these returns = 960 + 609 = 1,569.
Bimal has to get this as Simple Interest by investing X rupees at 7.5%
That means, X x 0.075 = 1,569
X =20,920
So, Bimal has to invest 20,920 rupees.
Hence, 20920.

99. **(a)** The Shopkeeper procures the table at price 'p'
He gains 20% on the transaction with Amal
So, Amal buys the table at '1.2p
Amal sells athe table at 30% profit,
So, the Selling Price of Amal = 1.3 x 1.2p = 1.56p
=x = 1.56p
The Shopkeeper loses 20% on the transaction with Asim
So, Asim buys the table at '0.8p"
Asim sells the table at 30% loss,
So, the Selling Price of Asim = 0.7 * 0.8p = 0.56p
=vy=056p
(x-y)/p = (1.56p -0.56p)/p = 1.
Hence, option (a).

100. **(12)** If John works the same number of regular and overtime hours say 'p'
The income would be 57p and 114p
Let's say that he works 'x' hours regular and 'y' hours overtime...
So, the income would be 57x and 114y
we are told that 114y is 15% of 57x
114y = 0.15 x 57x
y = 0.075x
we also know that x +y = 172
therefore, x + 0.075x = 1.075x = 172
x = 160
y=172-160 = 12Therefore, the number of hours he worked overtime is 12 hours.
Hence, 12.