AIMCAT 2013
VARC

DIRECTIONS for questions 1 to 5: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

What will remain in 100 years' time of the city or town where you were born: which landmarks or buildings? What about in 500 years? The controversial author Nassim Nicholas Taleb offers a counter-intuitive rule-of-thumb for answering questions like this. If you want to know how long something non-perishable will endure [….] then the first question you should ask is how long it has already existed. The older it is, the more likely it is to go on surviving.

The logic of Taleb's argument is simple. Because the only judge that matters when it comes to the future is time, our only genuinely reliable technique for looking ahead is to ask what has already proved enduring…

Taleb's preferred name for this line of reasoning is the Lindy Effect, for impeccably eccentric historical reasons. In June 1964, the American author Albert Goldman published an article titled "Lindy's Law" in The New Republic magazine in which he presented the "cautionary fable" of showbiz conversations in Lindy's delicatessen in New York. … [I]n-the-know comedians gathered [here] to discuss the likely staying power of their peers. If someone [used] up their material in a short burst of activity, the reasoning went, their career would soon be over. But if they [made] fewer but higher-impact appearances, this conservation of resources might see them endure for decades in the industry.

Taleb has extended this anecdotal insight considerably. "Things that have been around for a long time are not 'aging' like persons, but 'aging' in reverse," he writes in his 2012 book Antifragile. "Every year that passes without extinction doubles the additional life expectancy." … Consider London's buildings. ... They are subject to the same forces of wear and tear as everything else on Earth: they may be tough, but they cannot remain in good condition without human support. ... The longer something has endured, the more significance and symbolic meaning it has accrued – and the more tests of function and fashion it has passed. …Over the centuries, fortune and favour have fixed them into the city's identity.

The force of the Lindy effect – and the relationship between architecture and culture – can also be seen in the efforts of those who wish to eliminate something old. In the name of efficiency and anti-idolatry, Saudi Arabia has, over the last few decades, destroyed vast amounts of its ancient heritage, aiming to accommodate… the ultraconservative Wahhabi ideology of its rulers. Much of the country's culture and heritage are treated as a threat to this ideology, perhaps because those things that have lasted for centuries may engender more complex and enduring loyalties than absolute rulers are comfortable with. … The Lindy effect marks a deep threat and affront to those who wish to sweep away the complexities and intransigence of our relationship with the past

….

At this point, fitness in the evolutionary sense – that which has proved its worth and adaptability by surviving – may seem to be in conflict with one of the basic principles of reasoned argument. If you cannot give good reasons for something, it is not reasonable to believe it: and saying "things have been like this for a long time" is surely not a good reason to keep on doing something. Yet this is only a problem if we confuse "good" reasons in the sense of strong reasons with "good" reasons in the sense of praiseworthy or ethically desirable ones. …

Q1. The similarity between the Lindy effect, as proposed by Taleb, and the Lindy's Law, as described by Goldman, is that both

a) discuss the importance of conservation of resources for endurance sake.
b) emphasise that the age of something is a good indicator of its longevity.
c) try to predict the life expectancy of something based on its history.
d) talk about the benefits of enduring over a long period of time.

Number of words and Explanatory notes for RC:

Number of words: 564

The Lindy effect is proposed by Taleb to "*know how long something* ***non-perishable*** *will endure*". It can be best described as "the older [something] is, the more likely it is to go on surviving". He named this phenomenon after Lindy's Law, which was introduced by Albert Goldman.
The Lindy's Law as described by Goldman discusses the "staying power" of the comedians. If the comedians use up their material in a short time, they will not endure for a long time and vice versa.
Option A: When discussing Lindy's law, the author mentions that the "conservation of resources might see them endure for decades in the industry.". However, in the Lindy effect, the author does not mention conservation of resources. This factor is not meaningful in the context of Lindy effect (as this effect is about something non-perishable). Hence, this is not the similarity between the two.
Option B: Lindy's effect can be paraphrased to say that the age of something is a good indicator of its longevity. However, in Lindy's law, the age of the comedians is not discussed. Hence, we cannot infer that the age of the comedians is an indicator of his/her longevity. Therefore, this is not the similarity.
Option C: The Lindy effect tries to predict the life expectancy of non-perishable things based on how long they have survived. The Lindy's law tries to predict how long a comedian lasts in the industry based on how quickly he uses up his material. Hence, both these theories try to predict the life expectancy of things, whether they are non-perishable (as per Lindy effect) or the careers of comedians (as per Lindy's law). Hence, this is the similarity between the two.
Option D: Neither the Lindy's law nor the Lindy effect talks about the benefits of enduring over long periods of time. It does not indicate that short lived things are inferior and long-lived things are superior. Hence, this is not the similarity.
Therefore, the correct answer is option C. Choice (C)

Q2. "[T]he relationship between architecture and culture", mentioned in the penultimate para of the passage, best manifests itself in which of the following statements, taken from the passage?

a) "Over the centuries, fortune and favour have fixed [the buildings] into the city's identity."
b) "The longer something has endured, the more significance and symbolic meaning it has accrued".
c) "[The buildings] may be tough, but they cannot remain in good condition without human support."
d) "Every year that passes without extinction doubles the additional life expectancy."

Number of words and Explanatory notes for RC:

Number of words: 564

The passage mentions that the architecture and culture are related in the penultimate paragraph of the passage. This paragraph does not provide any information on how the author has established the relationship. In the previous paragraph, however, the author talks about how buildings need ***human support*** and that over time, they ***accumulate symbolic meaning*** and become ***part of the city's identity***. We need to identify the sentence which best captures this essence.

Option A: This statement mentions that the buildings have become part of the city's identity. We can infer that the city's identity is closely linked to culture. Hence, this statement describes how the buildings have become part of our culture: by fortune and favour. Therefore, this statement helps establish the relationship between architecture and culture.

Option B: This statement describes how anything that has endured will accumulate symbolic meaning and become part of our culture. However, this is a generalization of the statement mentioned in option A. While the statement in option A mentions buildings specifically, this option is more a generalized statement of all things that endure. This statement establishes a relation between ***things that endure*** and ***culture*** but not between ***architecture*** and ***culture***. Hence, option A is a better answer than option B.

Option C: This statement talks about the importance of human support in maintaining a building in good condition. However, needing human support does not imply that it becomes a part of culture. Needing human support is one aspect which helps a building become part of the culture (i.e., between fortune and favour, human support can be equated to favour). Hence, this statement does not establish a link between architecture and culture.

Option D: This statement has the same shortcoming as that of option B. It does not specifically establish a link between architecture and culture. It talks about how the age of something is important for its durability. Hence, this is not the correct answer.

Therefore, the correct answer is option A. Choice (A)

Q3. Which of the following, if true, is the best example of "aging in reverse" as mentioned in the passage?

a) The life expectancy of certain tortoises doubles for every additional year of its survival.
b) The longer a book has been in print, the greater the number of copies it would have sold.
c) A company which was established a year earlier than another company is twice as likely to survive.
d) With each additional year of survival, the time for which an ideology can further endure doubles

Number of words and Explanatory notes for RC:

Number of words: 564

According to Taleb, "Things that have been around for a long time are not 'aging' like persons, but 'aging' in reverse". For such things, every year that it survives "doubles the **additional** life expectancy." From this we can infer aging in reverse to mean that every year of survival must increase its additional life expectancy.
Option A: According to the author, every year of survival, doubles the ***additional*** life expectancy. However, this option says that every year doubles the life expectancy, which is different from the "additional" life expectancy mentioned in the passage. Hence, this is not the correct answer.
Option B: The number of the copies a book would have sold is not related to the aging process and is also not related to the life expectancy that Taleb describes. Hence, this example is also not valid.
Option C: The aging process that Taleb describes is not about ***the likelihood*** of survival. It is about ***how long*** it will survive. The likelihood of survival and how long something will survive are two different factors. The former indicates how likely it is for anything to survive (and is not related to the duration), while the latter indicates the time period for which something can survive. The second factor indicates the life expectancy, but the first does not. This option mentions that one company is twice as likely to survive compared to another. However, this does not translate into life expectancy and hence, is not a valid example.
Option D: The example provided in this option indicates that with every passing year, the life expectancy of the ideology doubles. This is what Taleb has described about aging in reverse. Hence, this is the best example of the process of aging in reverse.
Therefore, the correct answer is option D. Choice (D)

Q4. The author provides the example of Saudi Arabia to

a) highlight the conflict between the loyalty to the rulers and the loyalty to cultural artefacts.
b) provide a real-world example of how the Lindy effect negatively impacts cultural artefacts.
c) emphasise the threat that the Lindy effect represents to autocratic rulers.
d) establish the complex relation between architecture and ideology

Number of words and Explanatory notes for RC:

Number of words: 564

In the penultimate paragraph of the passage, the author mentions that "***the force of the Lindy effect***... can also be seen in the efforts of those who wish to eliminate something old". He mentions Saudi Arabia as an example of the 'force of Lindy effect'. The author explains that buildings which are around for a long time become part of our culture and the rulers are not comfortable with these things as they "may engender ***more complex and enduring loyalties***".

Option A: The author does not mention conflict between loyalty to rulers and loyalty to cultural artefacts. He only mentions that the rulers are not comfortable with the loyalty that these buildings engender. Hence, there is no conflict between loyalties that is being highlighted.

Option B: The author starts the paragraph by stating that "the force of Lindy effect... can be seen in the efforts of those who wish to eliminate something old". However, he does not imply that Lindy effect has a negative impact on culture. As a concept, Lindy effect does not have any impact on the cultural artefacts. However, the rulers (because of the force of the Lindy effect) have damaged the cultural artefacts in Saudi Arabia. Therefore, this is not the correct answer.

Option C: From the example of Saudi Arabia, the author concludes that "The Lindy effect marks a **deep threat** ... those who wish to sweep away the ... intransigence of our relationship with the past". These people are mentioned to be the absolute or autocratic rulers who are not comfortable with the Lindy effect. Hence, this is the correct answer.

Option D: Even though the author talks about the Wahhabi ideology and the historical buildings, he does not establish any link between architecture and ideology in general using the example of Saudi Arabia. Hence, this is not the correct answer.

Therefore, the correct answer is option C. Choice (C)

Q5. Which of the following can be inferred about the reason that "things have been like this for a long time", to keep on doing something?

a) It can be a "good" reason, if we consider "good" to mean strong.
b) It can be a strong reason, which is often confused with being a praiseworthy reason.
c) It can be an ethically desirable reason but it is often confused with being a strong reason.
d) It can be a laudable and ethically desirable reason.

Number of words and Explanatory notes for RC:

Number of words: 564

In the last paragraph of the passage, the author talks about reasons which are good and the way in which we can define good.
The author mentions that one of the basic principles of reasoned argument is that "if you cannot give good reasons for something, it is not reasonable to believe it". Further, a reason like ""things have been like this for a long time" it is surely not a good reason to keep on doing something". However, he goes on to describe two types of "good" reasons. "Good" reasons can mean strong reasons and they can also mean reasons that are "praiseworthy or ethically desirable ones". The author opines that if we do not confuse between these two types of good reasons, then there is no problem. From this we can infer that a reason like "things have been like this for a long time" is not a good reason, when good is taken to mean "strong" but can be a good reason, when good is taken to mean "praiseworthy".
Option A: The author mentions that this is not a good reason. From the above explanation, we can infer that the author means that this is not a good reason, if we take "good" to mean "strong". Hence, this option is incorrect because, the author does not imply that we should take the meaning of good to be strong, for reasons like this.
Option B: The author does not imply that this reason is confused to be a praiseworthy reason. The confusion exists only around how we define good and not around the reason itself. Hence, this is not the correct answer.
Option C: As explained in the above option, the confusion is not around the reason itself, but it is around the definition of good. Hence, this is not the correct answer.
Option D: We can infer from the author's explanation that the reason can be a praiseworthy and an ethically desirable reason.
Therefore, the correct answer is option D. Choice (D)

DIRECTIONS for questions 6 to 10: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.
Political scientists, like other social and natural scientists, gather data and formulate theories. The two tasks are often out of balance, however, leading either to the collection of irrelevant facts or to the construction of misleading theories. Throughout the post-World War II era, political scientists developed and discarded numerous theories, and there was considerable (and unresolved) debate as to whether it is more important to develop theories and then collect data to confirm or reject them or to collect and analyze data from which theories would flow… Prior to the development of reliable survey research, most political analyses focused on elites. Once a sizable amount of research had become available, there was a considerable debate about whether rulers are guided by citizen preferences, expressed through interest groups and elections, or whether elites pursue their own goals and manipulate public opinion to achieve their ends. Despite numerous studies of public opinion, voting behaviour, and interest groups, the issue [remains] unresolvable. Analyses can establish statistical relationships, but it has been difficult to demonstrate causality with any certainty. This debate is complicated by two factors. First, although there is a considerable body of survey and electoral data, most people ignore politics most of the time, a factor that must be considered in attempting to understand which part

of the “public” policymakers listen to – all citizens, all voters, or only those expressing an intense view on a particular matter. Political analyses based on elites are hindered by a dearth of reliable elite-level data, as researchers are rarely invited into the deliberations of rulers. Accordingly, much is known about the social bases of politics but little of how and why decisions are made. Even when decision-makers grant interviews or write their memoirs, firm conclusions remain elusive, because officials often provide accounts that are self-serving or misleading. Political science has had difficulty handling rapid change; it prefers the static (stable political systems) to the dynamic. If historians are stuck in the past, political scientists are often captives of the present. For some, the collapse of the Soviet Union showed that the theories and methods of political science are of only limited utility. Despite decades of gathering data and theorizing, political science was unable to anticipate the defining event of the post-World War II era. Critics charged that political science could describe what is but could never discern what was likely to be. Others, however, maintained that this criticism was unfair, arguing that such upheavals can be predicted, given sufficient data...

At the beginning of the 21st century, political science was faced with a stark dilemma: the more scientific it tried to be, the more removed it found itself from the burning issues of the day. Although some research in political science would continue to be arcane and unintelligible to the layperson and even to other scholars, many political scientists attempted to steer a middle course, one that maintained a rigorous scientific approach but also addressed questions that are important to academics, citizens, and decision makers alike. Indeed, some political scientists, recognizing that many “scientific” approaches had lost their utility after a decade or two, suggested that the discipline should cease its attempts to imitate the natural sciences and return to the classic concerns of analysing and promoting the political good.

Q6. Political analyses involving elites is hampered by

a) the lack of a sizable amount of electoral data.
b) the exclusion of analysts from the discussions of the elites.
c) the misleading accounts provided by those who grant interviews.
d) the interest-driven approach of elites to serve their own interests.

Number of words and Explanatory notes for RC:

Number of words: 545

Consider the sentences: '*Political analyses based on elites are **hindered** by a dearth of reliable elite-level data, **as** researchers **are rarely invited into the deliberations of rulers**. **Accordingly**, much is known about the social bases of politics but little of how and why decisions are made. Even when decision makers grant interviews or write their memoirs, firm conclusions remain elusive, because officials often provide accounts that are self-serving or misleading.*' So, the para mentions clearly that it is hindered by shortage of reliable elite-level data, which in turn is **because** researchers are rarely invited to the discussions of rulers (policymakers/decision-makers/elites).
Option A: Sizable amount of elite-level data is not available. However, this is different from **electoral data** which is not related to analysis involving elites. Option A is not the answer.
Option B: This option reflects the explanation provided above – that researchers are rarely invited into the deliberations of rulers, which leads to a dearth of elite-level data for researchers, hindering political analyses. Hence, Option B is the answer.
Option C: This does create a problem – the reliability of data. However, this is an issue different from the issue of the dearth of elite-level data. This option talks about why "little is known about how decisions are made". Little is known because decision-makers either don't give information or give out false information to suit their own purpose. So, this line of reasoning doesn't explain why political analyses involving elites is hampered. Option C is not the answer.
Option D: Whether elites are self-interest-driven or not is one of the debates discussed in the passage. It has not been settled. Even if it is, there is no connection between political analysis of elites and why it is being hindered and the self-interest-driven approach of the elites, a completely different topic. Hence, Option D is not the answer.

Choice (B)

Q7. The author believes that political scientists are "captives of the present" because political scientists

a) struggle to adapt to swift changes.
b) take time to come to terms with the rapidity of changes in political systems.
c) are dynamic and live in the present.
d) fail to anticipate defining events.

Number of words and Explanatory notes for RC:

Number of words: 545

Consider the sentences: '*Political science has had **difficulty handling rapid change**; it prefers the static (stable political systems) to the dynamic. If historians are stuck in the past, **political scientists are often captives of the present**.*'
Option A: Since, it is clearly mentioned that political scientists have difficulty handling rapid change (which is why they are said to be stuck in the present), it is safe to infer that political scientists struggle to adapt to swift changes. Option A is the answer.
Option B: Political scientists prefer the static – stable political systems. This cannot be extrapolated to state that they ***take time to come to terms*** with the changes in political systems. Coming to terms is accepting or getting used to. But it has been mentioned that political scientists don't get used to instability – since they have difficulty handling rapid change. We cannot assume that they will eventually come to terms. Option B is not the answer.
Option C: This option has a positive tone to it because of the word 'dynamic'. 'Captive' is a negative word. It is clear, therefore, that this option can be eliminated on tone, as political scientists are not being praised in the aforementioned sentence. Option C is not the answer.
Option D: No connection has been drawn between their failure to anticipate defining events (even though that is a criticism against the political analysts) and their living in the present. Why exactly are they captives of the present if they cannot anticipate future events? that connection cannot be made. Hence, Option D is not the answer.
Choice (A)

Q8. Which of the following statements, if true, will weaken the criticism against political scientists in the post-World War II era?

a) The data gathered by political scientists could not really account for the political and cultural volatility of the Soviet Union.
b) World events unravel at a much more rapid pace than political scientists are comfortable dealing with.
c) Given sufficient data that encompasses political patterns, political scientists can make predictions about political events.
d) Political science was less of a science and more of a way to push the agenda of political good.

Number of words and Explanatory notes for RC:

Number of words: 545

Consider the sentences: '*Despite decades of gathering data and theorizing, political science was unable to anticipate the defining event of the post-World War II era. Critics charged that* ***political science could describe what is but could never discern what was likely to be***.' So, the criticism is that political scientists are not efficient enough to predict the future events. This criticism can be weakened in two ways: a. if it is proven that they do predict future events to the best possible extent or b. if it is proven that not being able to predict isn't necessarily because of their inefficiency/inability but because of the lack of data/research etc.

Option A: The collapse of the Soviet Union is one example of a bigger criticism. Even considering just this example, it is not clear from the option, who is at fault. The data gathered couldn't account for Soviet Union's volatility. Is it because the wrong data was gathered by political scientists (will strengthen the criticism) or is it because the right data isn't even available (will weaken the criticism against them)? Hence, Option A is not the answer.

Option B: Not all world events necessarily unravel at the same pace, rapid or slow. Speed is not part of the equation here or part of the criticism that political scientists do not predict future events. Yes, it is mentioned elsewhere that political scientists have trouble responding to rapid change. However, that is with respect to handling the changes, and not with respect to predicting them. Hence, Option B is not the answer.

Option C: This option explains that if there is sufficient data to spot, then predictions could be made, something that was a question mark on political scientists. It thereby argues in favour of political scientists and weakens the criticism against them. Hence, Option C is the answer.

Option D: The purpose of political science (to achieve political good) is a loose definition that doesn't help us understand whether or not it is the job of political scientists to predict future events. Hence, Option D is not the answer.

Choice (C)

Q9. The dilemma faced by political science at the beginning of the 21st century is that

a) it is impossible to walk the tightrope between being scientific and being relevant to policymakers.

b) a rigorous scientific approach could steer political scientists away from addressing questions relevant to contemporary events.

c) some of the research in political science is obsolete and difficult to comprehend.

d) a focus on science stops researchers from focusing on doing political good.

Number of words and Explanatory notes for RC:

Number of words: 545

Consider the sentences: '*At the beginning of the 21st century, political science was faced with a* ***stark dilemma: the more scientific it tried to be, the more removed it found itself from the burning issues of the day***. *Although some research in political science would continue to be arcane and unintelligible to the layperson and even to other scholars, many political scientists attempted to steer a middle course, one that maintained a rigorous scientific approach but also addressed questions that are important to academics, citizens, and decision makers alike.*' The dilemma is between pushing for more scientific methods (research and analysis) versus pushing towards more contemporary relevance.

Option A: The dilemma is about two choices presented to the political scientists. So, whether it is possible or not possible to walk the tightrope, obviously, is not part of the dilemma, or part of the problem. The choice between being scientific and being relevant is the dilemma – not whether it is easy or difficult. Hence, Option A is not the answer.

Option B: This is the dilemma – to follow a rigorous scientific approach of analysis (which could become unintelligible for the layman) or to stick close to the burning issues or contemporary events and address questions that are important to everyone. Hence, Option B is the answer.

Option C: While this is a concern, it is only one side of the story – that research is often unintelligible/hard to comprehend for the layman. Hence, this not the dilemma being referred to in the passage. Option C is not the answer.

Option D: A focus on science takes political scientists away from deliberating about policy/burning issues and ***questions that are important to academics, citizens, and decision makers alike***. All this cannot directly be equated to ***political good***. The conclusion of the passage is that some political scientists want to move away from natural sciences '***and return to the classic concerns of analysing and promoting the political good'.*** This is not the dilemma and it is the thought process of only ***some*** political scientists. Hence, Option D is not the answer. Choice (B)

Q10. Which of the following studies can be helpful to ascertain the nature of work that political scientists should take up?

a) A study that collates information about strong public opinions and voting behaviour of all citizens.

b) A study that analyses the accuracy of information provided by the decision-makers in interviews and personal memoirs.

c) A study that analyses the duration for which a scientific method stays relevant.

d) A study of the best practices of scientific approach which could address the analysis of contemporary events.

Number of words and Explanatory notes for RC:

Number of words: 545

Option A: From '*Despite numerous studies of public opinion, voting behaviour, and interest groups, the issue [remains] unresolvable*', we know that this information is already available, but pointless to solve the bigger question of causality: Should theory be framed and data used to prove or refute it or should data be collected and then a theory be framed based on the data. Option A is not the answer.
Option B: The author feels there isn't enough elite-level data or data about decisions (since decision makers provide fallacious information). The author is certain data provided by decision-makers is not accurate. So, checking its accuracy is a futile exercise, and it doesn't really help in achieving anything. Also, we are looking at the much bigger debate of the direction political science must take-scientific approach or contemporary events. Option B is not the answer.
Option C: The author has already mentioned quite clearly that scientific methods become obsolete '***after a decade or two***'. Hence, such a study would not really achieve anything. Option C is not the answer.
Option D: If we can study the best practices of scientific approach to analyse and address their importance to studying contemporary events, it will help political scientists walk a middle path. This can be understood from '*many political scientists attempted to steer a middle course, one that maintained a rigorous scientific approach but also addressed questions that are important to academics, citizens, and decision makers alike*'. Such an attempt can be formalised and used by more or all political scientists. Hence, Option D is the answer. Choice (D)

DIRECTIONS for questions 11 to 15: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.
Streaming is the most popular way people listen to music, but old formats like cassettes and vinyl have both seen an increase in sales in recent years…[T]his means that more non-recyclable discs will be manufactured – which could have a negative impact on the environment.
…[Records] were originally made of shellac, before non-recyclable vinyl was used as a replacement. Shellac is a natural resin … scraped from trees to produce gramophone records. Since shellac isn't derived from fossil fuels, its carbon footprint was lower than that of modern records.
Shellac records were brittle and prone to damage from water and alcohol; so, PVC plastic records were developed as a more durable alternative. In ideal conditions, … discarded PVC is likely to take centuries to decompose. The environmental conditions of most landfill sites can cause discarded PVC albums to leach plasticisers (solvents added to plastics to make them more flexible and resilient). They may even outlive the site itself or escape into the environment as pollutants.
…In the 80s, records were replaced by CDs … made of layered polycarbonate and aluminium, which has slightly less environmental impact than PVC... However, CDs can't be recycled because they're made of mixed materials, which are difficult and uneconomical to separate into their component parts for recycling. CDs were also encased in fragile polycarbonate cases,

which, despite being a single material, aren't widely recycled, [and] scratched and damaged disks often ended up in landfills.
… [Low-quality, cheap CDs] were easily damaged by direct exposure to sunlight and heat, warped by fast-changing temperatures, gravity, scratches, fingerprints and smudges – subsequently resulting in them getting thrown out.
Current digital technology, however, gives us flawless music quality without physical deterioration. Music is easy to copy and upload, and can be streamed online without downloading. Since our digital music is less tangible than vinyl or CDs, surely it must be more environmentally friendly?
Even though new formats are material-free, that doesn't mean they don't have an environmental impact. The electronic files we download are stored on active, cooled servers. The information is then retrieved and transmitted across the network to a router, which is transferred by wi-fi to our electronic devices. This happens every time we stream a track, which costs energy...
So, which is the greener option? It depends on many things, including how many times you listen to your music…If you listen repeatedly, a physical copy is best – streaming an album over the internet more than 27 times will likely use more energy than it takes to produce and manufacture a CD. If you want to reduce your impact on the environment, then vintage vinyl could be a great physical option. For online music, local storage on phones, computers or local network drives … will reduce the need for streaming over distance from remote severs across a power-hungry network.
In a world where more and more of our economy and social relations happen online, records, and other vintage music formats, buck that trend. Instead, the record revival shows us [that] … older music formats [endure because] they have a sense of importance and permanence attached to them. It seems that whatever the format, owning copies of our favourite and most treasured music, and playing them over and over again, might just be the best option for our environment.

Q11. Cassettes and vinyl are making a comeback, according to the author, because:

a) they are far more reliable than CDs.
b) their transient nature makes them attractive to possess.
c) vintage formats have a sense of importance and permanence.
d) owning copies of music and playing them over and over again is the right thing to do.

Number of words and Explanatory notes for RC:

Number of words: 549

Option A: The reliability of cassettes and vinyl has not been discussed *per se*, especially with respect to CDs. As far as the author is concerned all three have a net negative effect on the environment. Hence, Option A is not the answer.
Option B: They could be played repetitively. So, the author isn't hinting at their transient nature for sure. Hence, Option B is not the answer.
Option C: Consider the sentences: '*In a world where more and more of our economy and social relations happen online, records, and* **other vintage music formats, buck that trend**. *Instead, the record* **revival shows us [that] ... older music formats [endure because] they have a sense of importance and permanence** *attached to them.*' Here, it is clearly mentioned why the author thinks they are making a comeback. Option C is the answer.
Option D: This option doesn't explain why cassettes and vinyl are making a come back specifically, as this choice also applies to downloaded music which can be played again and again without further environmental impact, once downloaded. Hence, Option D is not the answer. Choice (C)

Q12. All of the following are true about the negative environmental impact of CDs EXCEPT that:

a) CDs are encased in fragile polycarbonate cases which are not recycled.
b) CDs are easily damaged due to light and heat reducing the utility of CDs.
c) it is not economically feasible to recycle CDs because of their mixed components.
d) the materials used in CDs have a greater environmental impact than PVC does.

Number of words and Explanatory notes for RC:

Number of words: 549

Option A: While this isn't a direct issue, it is indirectly a reason according to the author as understood from the sentences: '*However, CDs can't be recycled because they're made of mixed materials, which are* ***difficult and uneconomical to separate into their component parts for recycling***. *CDs were* ***also*** *encased in fragile polycarbonate cases, which, despite being a single material, aren't widely recycled.*' So, part of the problem is that CDs can't be recycled. And the other part of the problem is that their cases are also not recycled (reason not mentioned). Hence, Option A is an indicator of their environmental impact. Option A is not the answer.
Option B: CDs are damaged easily, which leads to their being discarded a lot, thus filling the landfills (literally, and metaphorically, contributing to non-recyclable junk). Hence, Option B is not the answer.
Option C: This is a direct reason for the negative environmental impact of CDs. Since, CDs are made of mixed components, it is not practical or economical to recycle them. Hence, Option C is not the answer.
Option D: This is factually not true. In fact, the only reason CDs came to replace PVC according to the passage was the lower environmental impact of polycarbonates and aluminium, used to make CDs, compared to PVC. Hence, Option D is the answer.

Choice (D)

Q13. Which of the following statements, if true, will most strengthen the author's central argument?

a) The cost of recycling CDs and their cases will pay for itself in a short time.
b) Studies have shown that many music listeners do not listen to many of their tracks more than 27 times.
c) People collect vinyl because they prefer physical copies to digital copies.
d) Surveys have shown that music listeners often stream the same music hundreds of times.

Number of words and Explanatory notes for RC:

Number of words: 549

The author's central argument is that if you play a song too often, it is better to own a copy of it to play it – either a local digital copy or physical copy. If you are likely to play a song for more than 27 times, it is better to own a physical copy than streaming it.
Option A: The author doesn't really contradict this statement. All we know is that recycling of CDs is not economically feasible (which is not the same as saying cost of recycling is more than the profit derived out of it). Hence, this option neither strengthens nor weakens the author's central argument.
Option B: If they don't listen to a track for more than 27 times, then they can stream it without leaving a greater negative impact on the environment than when they buy a vinyl copy. So, streaming is always a better choice. However, this can be inferred from the information the author has provided. So, it will neither strengthen nor weaken the author's argument, because the author's main argument is tied up with how often you listen to your music. Option B is not the answer.
Option C: While this goes against the author's logic as to why music listeners prefer vinyl over digital copies, it doesn't affect the author's central argument about why we should own copies if we want to listen to them over and over again. Hence, Option C is not the answer.
Option D: This is an argument against streaming. This option strengthens the case for downloading music and saving it rather than streaming it (given that music listeners are listening to the same music hundreds of times). It strengthens the author's argument. Option D is the answer. Choice (D)

Q14. The shift from shellac to PVC indicates that:

a) record-makers were more concerned about durability than about decomposability of the material.
b) environmental awareness was poor until the 80s.
c) the ill-effects of plastic weren't really known until CDs began to be manufactured.
d) natural resins are not ideal for goods that are produced for longevity.

Number of words and Explanatory notes for RC:

Number of words: 549

Option A: This can be understood directly from the fact that shellac made of natural resins was replaced by PVC plastic because shellac records were prone to damage. This shows that manufacturers were worried about music records lasting long and didn't really ponder over the environmental impact or how long those records will stay in the landfills or in the environment. Hence, Option A is the answer.
Option B: In the 80s, they started making CDs which still had a net negative environmental impact. So, a judgment cannot be made about when people had environmental awareness and when they didn't. Probably, they still don't (because of streaming of music).
Option C: We cannot really conclude whether they shifted from shellac to PVC plastic knowing the harm plastic does or unaware of it. Hence, Option C is not the answer.
Option D: Shellac is made of natural resin and shellac records are brittle. This doesn't let us extrapolate it to an extent to state that natural resins in general are not ideal for goods produced to last long. It may be possible. Hence, Option D is not the answer.

Choice (A)

Q15. In believing that records and vintage music formats 'buck that trend' (last para), the author assumes that:

a) increased sales of records are a good indicator of decreasing music streaming.
b) people buy records as an alternative to their digital music.
c) digital music doesn't give people a sense of permanence.
d) those who consume music have become more environmentally aware.

Number of words and Explanatory notes for RC:

Number of words: 549

Consider the sentences: '*In a world where* ***more and more of our economy and social relations happen online****, records, and other vintage music formats, buck that trend.*' So, it can be understood that the trend being spoken about here is that things are shifting online. The author feels that people picking records is an example of going against that trend (buck the trend). They are going against the trend when they pick vinyl, despite having the option to choose from online avenues.

Option A: The author's statement could be true even if more and more music listeners are downloading stuff from online (instead of streaming it). The assumption is about vinyl versus internet, and not vinyl versus streaming. Also, 'bucking the trend' doesn't imply or doesn't need the author to assume that sales of records are greater than sales online (it is simply a reverse trend). Hence, Option A is close, but not the answer.

Option B: Only if the author assumes this, will he/she be able to conclude that increasing record sales are an indicator that records buck the trend of increasing internet popularity. Also, negation of an assumption should negate the argument. If it is not true that people buy records to replace digital music, then it means they could be spending just as much time online as they previously were (streaming or downloading instead of listening from vinyl records). In that case, the author cannot really make that statement. Hence, Option B is the answer.

Option C: This is the author's explanation for why records are able to buck the trend. The assumption of the author is more about how he/she arrived at the conclusion that rising record sales show that they are able to buck the trend. In other words, this idea is downstream to the author's first argument that record sales buck the trend. Hence, Option C is not the answer.

Option D: The author is simply talking about the trends and comparing environmental impact of each type of music storage. In that regard, it hasn't been established that vinyl records are always the greenest option. That they buck the present trend of internet popularity is a conclusion that the author doesn't need to arrive assuming anything about environmental impact since environmental awareness is not the core of this particular argument (internet popularity is the essence of this particular argument). Hence, Option D is not the answer. Choice (B)

DIRECTIONS for questions 16 to 19: The passage given below is accompanied by a set of four questions. Choose the best answer to each question.

The US and the world are engaged in a great debate about new trade agreements. Such pacts used to be called free-trade agreements; in fact, they were managed trade agreements, tailored to corporate interests, largely in the US and the EU. Today, such deals are more often referred to as partnerships, as in the Trans-Pacific Partnership (TPP). But they are not partnerships of equals: the US effectively dictates the terms. Fortunately, America's "partners" are becoming increasingly resistant.

It is not hard to see why. These agreements go well beyond trade, governing investment and intellectual property as well, imposing fundamental changes to countries' legal, judicial, and regulatory frameworks, without input or accountability through democratic institutions.

Perhaps the most invidious part of such agreements concerns investor protection. Of course, investors have to be protected against rogue governments seizing their property. But that is not what these provisions are about. There have been very few expropriations in recent decades, and investors who want to protect themselves can buy insurance from the Multilateral

Investment Guarantee Agency, a World Bank affiliate, and the US and other governments provide similar insurance. Nonetheless, the US is demanding such provisions in the TPP, even though many of its partners have property protections and judicial systems that are as good as its own. The real intent of these provisions is to impede health, environmental, safety, and, yes, even financial regulations meant to protect America's own economy and citizens. Companies can sue governments for full compensation for any reduction in their future-expected profits resulting from regulatory changes.

This is not just a theoretical possibility. Philip Morris is suing Uruguay and Australia for requiring warning labels on cigarettes [and] mandating the inclusion of graphic images showing the consequences of cigarette smoking. The labelling is working. It is discouraging smoking. So now Philip Morris is demanding to be compensated for lost profits.

In the future, if we discover that some other product causes health problems (think of asbestos), rather than facing lawsuits for the costs imposed on us, the manufacturer could sue governments for restraining them from killing more people. The same thing could happen if our governments impose more stringent regulations to protect us from the impact of greenhouse gas emissions.

… And, though corporations can bring suit, others cannot. If there is a violation of other commitments – on labour and environmental standards, for example – citizens, unions, and civil society groups have no recourse. If there ever was a one-sided dispute-resolution mechanism that violates basic principles, this is it…American supporters of such agreements point out that the US has been sued only a few times so far and has not lost a case. Corporations, however, are just learning how to use these agreements to their advantage. And high-priced corporate lawyers in the US, Europe and Japan will likely outmatch the underpaid government lawyers attempting to defend the public interest. Worse still, corporations in advanced countries can create subsidiaries in member countries through which to invest back home, and then sue, giving them a new channel to block regulations…

Rules and regulations determine the kind of economy and society in which people live…The question is whether we should allow rich corporations to use provisions hidden in so-called trade agreements to dictate how we will live in the 21st century…

Q16. Which of the following is not a reason that the author doesn't favour provisions for investor protection in trade agreements?

a) Insurance is available to investors from Multilateral Investment Guarantee Agency.
b) The US and several other countries offer mechanisms and safeguards to shield investments.
c) Cases of rogue governments seizing investor property have been few and far in between.
d) The provisions safeguard the health, safety, and financial regulations of the US despite these being a partnership of equals

Number of words and Explanatory notes for RC:

Number of words: 547

Option A: The author clearly asserts that '***investors who want to protect themselves can buy insurance*** *from the Multilateral Investment Guarantee Agency, a World Bank affiliate, and the US and other governments provide similar insurance*'. This shows that the author thinks the insurance will more than guarantee investor protection and that other dangerous provisions need not be included in trade agreements. Hence, Option A is not the answer.

Option B: The author explains that extra provisions to protect investors are not needed in trade agreements. Also, the author explains that '*investors who want to protect themselves can buy insurance from the Multilateral Investment Guarantee Agency, a World Bank affiliate, and* ***the US and other governments provide similar insurance***'. Option B is, therefore, not the answer because it is a reason provided as per the underlined portion above.

Option C: While the author believes that investor protection is important to prevent rogue governments from confiscating the property of the investors, this has not been such a big worry in recent times. This can be understood from 'investors have to be protected against rogue governments seizing their property. But that is not what these provisions are about. ***There have been very few expropriations in recent decades.***' So, this option shows why the author doesn't favour additional provisions. Option C is not the answer.

Option D: The author bemoans the fact that '*The real intent of these provisions is* ***to impede health, environmental, safety, and, yes, even financial regulations meant to protect America's own economy and citizens***.' So, these provisions, according to the author do not favour anyone in a trade agreement including the US. Rather, they are designed to give the investors an edge, undermining the existing system. So, this option doesn't offer a reason why the author doesn't favour the provisions. Also, this is TPP specific and doesn't apply to all the trade agreements. Hence, Option D is the answer. Choice (D)

Q17. The author calls the dispute-resolution mechanism one-sided because

a) America has been sued only a few times and has not lost a case.
b) While corporations can sue governments, the former can get away despite violation of commitment.
c) Governments cannot bring about regulations to protect the environment from greenhouse gas emissions.
d) Manufacturers of products that cause health problems can sue the government instead of paying penalties for the harm they cause.

Number of words and Explanatory notes for RC:

Number of words: 547

Consider the sentences: '*And, **though corporations can bring suit, others cannot**. If there is a violation of other commitments – on labour and environmental standards, for example – citizens, unions, and civil society groups have no recourse. If there ever was a one-sided dispute-resolution mechanism that violates basic principles, this is it…'* The author calls it one-sided, because corporations can sue governments, but civil society groups and citizens do not really have a way to stop corporations from violating their commitments.

Option A: This is the argument provided by those who favour these agreements in the US. However, this doesn't explain why the author thinks it is a one-sided dispute-resolution mechanism, which is that they favour the corporations but don't give citizens and civil society groups a way to deal with violations by the corporations. Hence, Option A is not the answer.

Option B: This explains both sides of the story. Corporations can bring suit, but citizens cannot when corporations violate commitments. That is why the author calls it one-sided. Disputes where corporations are in the wrong cannot be resolved, although in case of disputes where corporations are losing profits, they can sue governments. Hence, Option B is the answer.

Option C: This is a very specific example, firstly, and hence, isn't applicable here as an explanation for why the author calls the dispute resolution one-sided. Moreover, the government not being able to bring about regulations doesn't really demonstrate anything about ***resolution of disputes***, since this option doesn't talk about any disputes. Option C is not the answer.

Option D: Instead of being answerable, corporations can seek compensation for products that damage people's health or the environment. This is true. But the author follows this up with the statement 'And though, corporations can bring suit, others cannot.' So, the dispute-resolution mechanism is one-sided according to the author not because instead of paying reparations corporations can see damages. It is because they can move the court when they feel wronged. But citizens cannot move the court (or have no recourse rather) when corporations commit violations. Hence, Option D is not the answer.

Choice (B)

Q18. Which of the following is not a warning mentioned by the author to show that provisions for investor protection will be abused?

a) Corporations haven't yet figured out completely how to use the provisions to their advantage.
b) Corporations can invest in their home country through foreign holdings to circumvent regulations and benefit from investor protection.
c) Corporations have a greater chance of winning cases in the future thanks to the heft of highly paid lawyers working for them.
d) Corporations have understood how to use the agreements to their benefit

Number of words and Explanatory notes for RC:

Number of words: 547

Consider the sentences: '*American supporters of such agreements point out that the US has been sued only a few times so far and has not lost a case. Corporations, however, are just learning how to use these agreements to their advantage. And high-priced corporate lawyers in the US, Europe and Japan will likely outmatch the underpaid government lawyers attempting to defend the public interest. Worse still, corporations in advanced countries can create subsidiaries in member countries through which to invest back home, and then sue, giving them a new channel to bloc regulations…*'

Option A: In response to supporters of agreements pointing out that the US has been sued only a few times and has not lost a case, the author argues that corporations are just learning how to use these agreements. In other words, the corporations would only get better at exploiting these agreements. This increases the seriousness of the author's premonitions about abuse of these agreements. Option A is not the answer.

Option B: From '*Worse still, corporations in advanced countries can create subsidiaries in member countries through which to invest back home, and then sue, giving them a new channel to bloc regulations…*' we can understand that the author fears that corporations will open foreign holdings to invest in their home country, giving them the advantage of investor protection, using which they could avoid regulations. This strengthens the author's warnings that regulations will be misused. Hence, Option B is not the answer.

Option C: The author believes highly paid corporate lawyers will trump against lower-paid government lawyers and have their way. Hence, that will allow agreements to be abused further by corporations suing the government. Option C is not the answer.

Option D: This is only the beginning and corporations are only learning how to use these agreements. Hence, this option is against what the author actually means. The agreements will be abused by corporations going forward as they understand the system better. Hence, this option is not a warning mentioned by the author. Option D is the answer. Choice (D)

Q19. Which of the following inferences can most reasonably be drawn from the data and arguments provided by the author in the passage?

a) Pay given to lawyers is a parameter to determine the legal wherewithal of a corporation or government.

b) Corporations are driven by profits more than concern for environment and public health.

c) Trade agreements are designed purely to bypass the stringent regulatory framework within a country.

d) The US government is inclined more towards corporate interests than towards its social responsibilities.

Number of words and Explanatory notes for RC:

Number of words: 547

Option A: From '*And high-priced corporate lawyers in the US, Europe and Japan will likely outmatch the underpaid government lawyers attempting to defend the public interest*', we can understand that the pay plays an important role in determining which side has a stronger chance in the cases. While this is not tangible or quantifiable, it definitely has a role to play. Hence, Option A is an inference.
Option B: Corporations "can" misuse the agreements and sue the government for compensation for loss of profits. Corporations have the upper hand in these agreements. ***However, the passage doesn't suggest that all corporations are driven*** by profits and not concerns for environment and health. The author's argument is that even if they are, there is nothing to hold them accountable. Option B is not the answer.
Option C: The trade agreements are largely skewed towards corporates. However, we cannot infer or extrapolate it to the extreme that they were designed only to bypass the regulatory framework. Whether that is the purpose or not is something we cannot infer from the passage. The author does mention that these agreements go well beyond the regulatory frameworks. But we cannot infer that they were designed purely to do that. Option C is not the answer.
Option D: 'Social responsibilities' of the government haven't been defined in the passage. They will need to be assumed. Agreed that it can be inferred that the US government is undermining the regulatory framework of the country to favour the corporations. Yet, a comparison between favouritism towards corporations and social responsibilities cannot be drawn. Option D is not the answer. Choice (A)

DIRECTIONS for questions 20 to 24: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.
Fewer Africans are dying from malaria but the estimated number of cases has barely changed since 2011. Ten African countries and India account for 70% of global cases. Numbers in India are falling, but not in the worst-afflicted African countries. Some places, such as Zambia, are trying hard to tackle the disease. It was the first African country to use artemisinin-based combination therapies (ACTS), the recommended treatment. Some 70% of Zambians have access to treated bed nets or indoor sprays. Zambia's government works well with foreign groups such as the JC Flowers Foundation, which funds efforts at border villages like Mwanga. Reported deaths fell from 9,369 in 2001 to fewer than 1,425 in 2017. But the number of cases – 3.5m a year – has barely budged since 2014. Zambia has pledged to become the first sub-Saharan African country to eliminate malaria by 2021. ...
Malaria is proving resilient. One reason may be the declining share of families that use anti-mosquito sprays. Another may be resistance to the insecticides used in bed nets or sprays. African countries ridden with poverty also have shoddy public-health systems, especially in war zones such as northern Nigeria. Such places are typically not equipped to cope with new treatment-resistant strains of the disease. [Variants] resistant to chloroquine, a past treatment, have travelled around the world. And South-East Asia, where those variants appeared, is again suffering local outbreaks incurable by ACTS ...

Two types of malaria parasite most trouble the Greater Mekong Region. Plasmodium falciparum kills the most people globally. Plasmodium vivax [which is less deadly] is to blame for many malarial cases outside sub-Saharan Africa. Malaria parasites mutate to survive. In parts of the Mekong, the parasites Anopheles mosquitoes inject into the human bloodstream are dangerously resisting conventional treatment. ...

ACTS work in two main ways. The artemisinin lowers parasite levels in the body within about three days. A partner drug then works to clear them entirely. Resistance can develop to both artemisinin and the partner – and both are failing in Cambodia, Thailand, Laos, Vietnam, and Myanmar. The Mekong seems to spawn resistance to ACTS – its tropical climate, forests and rubber plantations are responsible. ... In the Mekong, malaria often affects young workers engaged in dodgy practices such as illegal logging. Many fail to seek help quickly or victims often stop taking long courses of medication too soon. Others turn to traditional healers before coming to clinics.

A prophylactic programme needs both to reduce the number of people bitten by infected mosquitoes and to shorten the time before infected people seek treatment. This requires adequate funding for rural health-care services and outreach programmes. Low-cost, rapid diagnostic tests remain one of the most important tools and coordinated government efforts make a big difference.

Without political commitment and the cash to match, the world risks a relapse in the fight against malaria. Such backsliding occurred in the 1960s, squandering the progress in the preceding decade against the disease in many countries, including India and Pakistan. The hope is that this time success breeds greater commitment rather than greater complacency. Donors, drug firms and governments of rich countries are all working on multi-drug-resistant malaria. A new pill to treat P. vivax infections, Tafenoquine, may soon be available. Any fresh breakthrough in new anti-malarial drugs should not only be supported by governments worldwide but also by privately funded agencies. This is where the Global Fund and JC Flowers Foundation could step in.

Scientists have been struggling for decades to produce a really effective vaccine. The battle to vanquish malaria remains extremely long and arduous.

Q20. When the author points to the “backsliding that occurred in the 1960s” (penultimate para), he opines that

a) the malaria malady has staged a dramatic comeback after its near-eradication in the early and mid-1950s.

b) there will be a welcome change from earlier times in the overall strategy for eradicating malaria.

c) progress made in fighting malaria before the 1960s was impeded by greater complacency in the 1960s.

d) as malaria mutates to survive, its elimination is proving difficult

Number of words and Explanatory notes for RC:

Number of words: 593

Option A: Without political commitment and the cash to match, the world risks a relapse in the fight against malaria. Such backsliding occurred in the 1960s, squandering the progress in the preceding decade against the disease in many countries, including India and Pakistan. From this it cannot be inferred that there was a near-eradication of malaria in the early and mid-1950s. Hence option A is not correct and is not the answer. It only means that the progress made in fighting the disease in the 1950s was rendered null and void in the 1960s. So option A is not the answer.
Option B: The passage does not mention any difference (in the overall strategy for fighting malaria). The passage ends on a slightly negative tone. Scientists have been struggling for decades to produce a really effective vaccine. The battle to vanquish malaria remains extremely long and arduous. So "welcome change" has not been suggested. Hence option B is not correct.
Option C: ***Without political commitment and the cash to match, the world risks a relapse in the fight against malaria. Such backsliding occurred in the 1960s, squandering the progress in the preceding decade against the disease in many countries, including India and Pakistan.*** From this, we can say that, in the 1960s, progress was impeded by greater complacency instead of being bolstered with greater commitment to fight the disease. Option C is the answer.
Option D: Option D is true from an overall reading of the passage and the last sentence of the passage. It is not representative of the second and third sentence of the penultimate paragraph as the question demands. Hence option D is not correct.

Choice (C)

Q21. Which of the following can be understood from the passage?

a. The term 'prophylactic programme' can be best substituted by the phrase 'programme that is associated with treatment of malaria'.
b. The JC Flowers Foundation should focus more on research activities pertaining to malaria eradication.
c. Shoddy public health systems are one of the reasons that have contributed to the spread of malaria.
d. In Africa, malaria cases are as frequent as ever and in South-East Asia, drug-resistant strains are appearing.

a) b and c
b) c and d
c) Only a
d) a, c and d

Number of words and Explanatory notes for RC:

Number of words: 593

Statement (a): ***A prophylactic programme*** *needs both to reduce the number of people bitten by infected mosquitoes and to shorten the time before infected people seek treatment. This requires adequate funding for rural health-care services and outreach programmes.* ***Low-cost, rapid diagnostic tests remain one of the most important tools and coordinated government efforts make a big difference***. Prophylactic means that which is intended to **prevent** diseases. So the term 'prophylactic programme' can be best substituted by the phrase 'programme that is associated with prevention measures' and not treatment. So (a) is incorrect and is not the answer.

Statement (b): Any fresh breakthrough in new anti-malarial drugs should not only be supported by governments worldwide but also by ***privately funded agencies***. ***This is where the Global Fund and JC Flowers Foundation could step in.*** "in an area where it could step in" has been suggested not that it should focus more on it. Also the line suggests that these agencies should focus on global funding in the fight against malaria and not necessarily focus more on research activities. So statement (b) is not the correct answer.

Statement (c): African countries ***ridden with poverty*** also have shoddy ***public-health systems***, especially in war zones such as northern Nigeria. So statement (c) is true and is the answer.

Statement (d): Fewer Africans are dying from malaria but the estimated number of cases has barely changed since 2011. Ten African countries and India account for 70% of global cases. Numbers in India are falling, but not in the worst-afflicted African countries. In Zambia, reported deaths fell from 9,369 in 2001 to fewer than 1,425 in 2017. But the number of cases – 3.5m a year – has barely budged since 2014. African countries are typically not equipped to cope with new treatment-resistant strains of the disease. So the first part of statement (d) is correct. [Variants] resistant to chloroquine, a past treatment, have travelled around the world. ***And South-East Asia, where those variants appeared, is again suffering local outbreaks incurable by ACTS*** ...

The second half of statement (d) is also correct.

Hence (c) and (d) are correct. Choice (B)

Q22. The author has primarily provided the example of the Greater Mekong Region in the passage to

a) cite the two types of malaria parasites causing havoc there.

b) discuss the sophisticated technologies it has developed to diagnose multi-drug-resistant malaria.

c) explain that its tropical climate, forests, rubber plantations and people behaviour have proved beneficial in successfully combating malaria.

d) highlight increasing resistance of the malarial parasites made possible by certain environmental features and local practices

Number of words and Explanatory notes for RC:

Number of words: 593

Option A: ***Two types of malaria parasite most trouble the Greater Mekong Region. Plasmodium falciparum kills the most people globally. Plasmodium vivax [less deadly] is to blame for many malarial cases outside sub-Saharan Africa.*** But the author has not mentioned the example of the Greater Mekong Region merely to highlight option A. He goes beyond that to say that in parts of the Mekong, the parasites Anopheles mosquitoes inject into the human bloodstream are dangerously resisting conventional treatment. ...So option A is incomplete and is not the answer.
Option B: Option B is out of scope. The passage does not say that the Greater Mekong Region has developed sophisticated technologies to diagnose multi-drug-resistant malaria.
Option C: The Mekong seems to spawn resistance to ACTS – its tropical climate, forests and rubber plantations are responsible. "spawn" means to cause something new, or many new things, to grow or start suddenly. So option C is a contradiction and is not the answer.
Option D: Resistance can develop to both artemisinin and the partner – and both are failing in Cambodia, Thailand, Laos, Vietnam, and Myanmar. ***The Mekong seems to spawn resistance to ACTS – its tropical climate, forests and rubber plantations are responsible***. ... In the Mekong, malaria often affects young workers engaged in dodgy practices such as illegal logging. Many fail to seek help quickly or victims often stop taking long courses of medication too soon. Others turn to traditional healers before coming to clinics. We can infer that certain environmental parameters and local practices are responsible for the increasing resistance of the malarial parasites against Artemisinin-based combination therapies (ACTS). So option D is correct and is the answer. Choice (D)

Q23. According to the author, Zambia

a) is on its way to becoming the first sub-Saharan African country to eliminate malaria.
b) has been declared malaria free by the WHO.
c) has reduced the fatalities resulting from malaria but not the frequency of its occurrence.
d) is the only African nation that adequately funds rural health-care services and outreach programmes.

Number of words and Explanatory notes for RC:

Number of words: 593

Option A: Zambia has pledged to become the first sub-Saharan African country to eliminate malaria by 2021 "has pledged" is nowhere close to "actually becoming ....". We cannot say that Zambia is on its way in achieving its target. So choice A is not the answer.
Option B: Some places, such as Zambia, are trying hard to tackle the disease. ***But the number of cases – 3.5m a year – has barely budged since 2014.*** So we cannot say that Zambia has been declared malaria free by the WHO. Choice B is not true.
Option C: Some places, such as Zambia, are trying hard to tackle the disease. It was the first African country to use artemisinin-based combination therapies (ACTS), the recommended treatment. Some 70% of Zambians have access to treated bed nets or indoor sprays. ***Reported deaths fell from 9,369 in 2001 to fewer than 1,425 in 2017. But the number of cases – 3.5m a year – has barely budged since 2014***. Hence option C can be inferred to be true.
Option D: Zambia's government works well with foreign groups such as the JC Flowers Foundation, which funds efforts at border ***villages*** like Mwanga. ....A prophylactic programme needs both to reduce the number of people bitten by infected mosquitoes and to shorten the time before infected people seek treatment. This requires ***adequate funding for rural health-care services and outreach programmes.*** From these relevant lines, we cannot infer that Zambia is the only African nation that adequately funds rural health-care services and outreach programmes. So option D is out of scope and is not the answer. Choice (C)

Q24. Which of the following is the primary concern of the author in the passage?

a) To challenge the validity of a therapy by exposing the inconsistencies and contradictions in it.
b) To discuss several challenges in the quest to eliminate a particular problem.
c) To support an alternative to an accepted methodology in treating malaria.
d) To explain reasons for the limitations of both traditional and newer methods of fighting malaria.

Number of words and Explanatory notes for RC:

Number of words: 593

Option A: Even as the passage talks about the Artemisinin-based combination therapies (ACTS), it does not describe the concerns of pursuing the said therapy nor does it expose the inconsistencies and contradictions in it. It only mentions that malarial parasites are showing resistance to the therapy. So choice A is not the main focus of the author.
Option B: The author of the passage suggests several challenges in the quest to eliminate the particular problem of malaria. He talks about the difficulties involved in eliminating malaria (mainly in Africa and South-East Asia). He ends on a pessimistic note. Scientists have been struggling for decades to produce a really effective vaccine. The battle to vanquish malaria remains extremely long and arduous. Hence option B is the correct answer.
Option C: In parts of the Mekong, the parasites Anopheles mosquitoes inject into the human bloodstream are dangerously resisting conventional treatment. ... The author does talk about the need for newer improved prevention programmes and adequate funding etc. This does not imply that he is rejecting conventional or accepted diagnostic, preventive and treatment measures completely. Also there is no mention of "any alternative" to an accepted methodology for treating malaria. So option C is not the answer.
Option D: The author has not enumerated reasons as to why newer methods of fighting malaria have limitations. So option D is not the answer. Choice (B)

Q25. DIRECTIONS for question 25: Five sentences related to a topic are given in the question 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. With bionic boots we get past the limiting factors of the spaghetti strap we call the Achilles' Heel.
2. Determined as he was to unlock the secret to their quickness, he eventually came up with a solution: super boots that (literally) add a spring to your step, increasing your force and speed.
3. His company Bionic Boot hopes to someday add pistons to their top grade aluminum and carbon fiber boots to help humans reach speeds of up to 45 mph.
4. Ever since he was a teenager, Keahi Seymour has admired the incredible speeds of the ostrich (up to 45 mph) and other land-dwelling two-legged creatures.
5. Many years and a dozen prototypes later, Seymour's latest version of his "bionic boot" has springs on the back emulating the achilles tendons of an ostrich or a kangaroo, and boosts a man's pace to a brisk 25 mph

Sentence 1: Sentence 1 is a standalone sentence which sounds a bit distant from the remaining sentences. Sentence 1 has a reference to 'bionic boots' and mentions a negative view of the Achilles' Heel (limiting factors of the spaghetti strap we call the Achilles' Heel).
Sentence 2: Sentence 2 has a reference to the pronoun 'he' and the clue "eventually came up with a solution". Here, "eventually" is an adverb that serves as a time indicator.
Sentence 3: Sentence 3 mentions a future course of action: hopes to add pistons .... Here 'someday' serves as a time indicator.
Sentence 4: Sentence 4 can be a good sentence to begin the paragraph. It mentions the name of the person who was taken up by the incredible speeds of the ostrich ....
Sentence 5: Sentence 5 mentions "later versions of his "bionic boot"". It also has the time indicator: Many years and a dozen prototypes later ...
On a careful reading of the sentences, it can be observed that sentence 4 is the best sentence to begin the paragraph. It highlights the main point of the para "admiration of the incredible speeds of the ostrich ..." (by a person). Sentences 4 and 2 form a logical block. "Keahi Seymour has admired the incredible speeds of the ostrich" in sentence 4 links with "Determined as he was to unlock the secret to their quickness" in sentence 2. "add a spring to your step, increasing your force and speed" in sentence 2 links with "incredible speeds of the ostrich" in sentence 4. So sentence 2 follows sentence 4.
Sentence 2 is followed by sentence 5. "Many years and a dozen prototypes later, Seymour's latest version of his "bionic boot"" in sentence 5 comes later in sequence than "eventually came up with a solution: super boots" in sentence 2. Also "emulating the achilles tendons of an ostrich or a kangaroo" in sentence 5 is parallel to "the incredible speeds of the ostrich" given earlier in sentence 4.
Sentences 5 and 3 form another logical block. "boosting a man's pace to a brisk 25 mph" in sentence 5 is followed by the future goal "to help humans reach speeds of up to 45 mph" in sentence 3. Sentence 3 follows sentence 5. Sentence 3 concludes the para. So, 4253.
Sentence 1 is the odd sentence out. "emulating the achilles tendons of an ostrich or a kangaroo" is given in a positive light. Now, "With bionic boots we get past" sounds positive and rhymes with the overall theme of the paragraph. But "limiting factors of (the spagetthi strap we call) the Achilles' Heel" in sentence 1 sounds negative and would need atleast one other sentence preceding it. Hence sentence 1 is the required answer.
Ans: (1)

Q26. DIRECTIONS for question 26: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

1. It's a map of galaxies, which are coloured according to their distance from us – the purple bits are closest, the red farthest away – and they are all in what astronomers, with their vertiginous sense of scale, call the "local universe" that stretches for 380m light years.
2. We are all familiar with maps of the globe, as though seen from space, unfolded onto a flat page with America on the left and China on the right.
3. But unlike those two-dimensional maps, this one allows us to see in three dimensions: up and down, left and right, and then out through the universe.
4. A new map, with a glowing web of blobs and veins like so many city lights at night, shows space seen from Earth similarly unfolded

Sentence 1: Sentence 1 has a detailed description of the map (It's a map ....)
Sentence 2: Sentence 2 sounds introductory in tone. It mentions 'maps of the globe'.
Sentence 3: Sentence 3 has the contrast marker 'but' and the contrast connector "unlike those two-dimensional maps". It also points to another map "this one allows ..."
Sentence 4: Sentence 4 has the clue 'a new map' and another clue 'similarly unfolded'.
Sentence 2 is the best sentence to begin the paragraph. The remaining sentences need a precedent and more substantiation. Sentence 1 has the introductory words "We are all familiar with". Sentences 2 and 4 form a logical block. "maps of the globe, as though seen from space" in sentence 2 is contrasted by "this map, shows space seen from Earth" in sentence 4. Also "unfolded onto a flat page" in sentence 2 links with "similarly unfolded" in sentence 4. "This map" in sentence 4 points to another map and not to the map of the globe (mentioned in sentence 2).
Now sentence 3 has to precede sentence 1. Sentence 1 gives additional details about 'this map' without any contrast with 'two-dimensional maps'. A description of a two-dimensional map has happened in sentence 2. Sentence 3 also mentions a contrast with two-dimensional maps. "unlike those two-dimensional maps" and "this one allows us to see in three dimensions" in sentence 3 contrasts "unfolded onto a flat page with America on the left and China on the right" given earlier in sentence 2.
So, sentence 4 is followed by sentence 3. "This map shows space seen from Earth similarly unfolded" in sentence 4 links with "this one allows us to see in three dimensions: up and down, left and right, and then out through the universe" in sentence 3. Sentence 3 is followed by sentence 1. "this one allows us to see in three dimensions: up and down, left and right, and then out through the universe" in sentence 3 links with "galaxies, which are coloured according to their distance from us – the purple bits are closest, the red farthest away" in sentence 1. "then out through the universe" in sentence 3 links with ""local universe" that stretches for 380m light years" in sentence 1. So, 2431. Ans: (2431)

Q27. DIRECTIONS for question 27: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.
The deep connection between literature and suffering suggests that imaginary societies designed for secular happiness will have rather little appeal as a literary subject. Utopia, in other words, will never become a central literary genre because the very premise of a world in which happiness is the norm threatens to remove the very thing that makes literature engaging. Even comedy, to be effective, dwells upon difficulty and confusion — until the happy ending hustles the lucky characters offstage before their blessings have a chance to cloy. As agents, we may aim at happiness, and utopia charms as an idea, but as spectators we prefer struggle and pain. This raises the suspicion that our affinity for happiness is strictly limited, and that many of us are dystopians at heart, most deeply at home in what Conrad called "the destructive element."

a) Literature leans towards suffering and, hence, away from utopian concepts, making us wonder whether it reflects the limitations of humanity's inclination for happiness.
b) Humans have a predilection for tragedy and that reflects in our literature, which generally drifts away from utopian ideas.
c) It is our innate nature to seek happiness from tragedy and that makes utopian subjects incompatible to literature.

d) Literature's inherent connection to suffering makes it impossible for utopias to be appealing, a glitch that comedies bypass by being centred around negative situations.

The first block of the para introduces ***literature's affinity towards suffering***. As a sub-idea we are told about how utopias will not predominantly feature in literature, but comedies manage to.
The second block introduces the thought that probably ***humans have a limited capacity for happiness*** because we are ***dystopians at heart.***
Option A: This option reflects the author's position the best, because it considers all the main angles, literature's leanings, and humanity's inclinations. Hence, Option A is the answer.
Option B: Firstly, the para doesn't establish that humans have a predilection for tragedy. Rather, it is a sense of questioning – 'raises the suspicion'. Secondly, the para is about literature's leanings allowing us to understand humans. That is not the same as the flow of this option which tries to understand literature from the inclinations of humans. Hence, Option B is not the answer.
Option C: Humans do not 'seek happiness' from tragedy according to the para. Humans affinity for happiness is limited, while they are inclined towards the destructive element. So, we cannot quite conclude that humans seek happiness in sadness. It is closer to say humans seek enjoyment in suffering (as spectators). Option C is not the answer.
Option D: While this does aptly represent how literature functions and why comedic themes do better than utopias, it doesn't represent the central concern of the para which is the suspicion or the question about humans' inclinations and affinities (towards happiness and suffering). Hence, Option D is not the answer.

Choice (A)

Q28. DIRECTIONS for question 28: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

1. Russia and Greece are major examples of 'individual loyalties' being informed less by impersonal discourses and more by fluid, shifting, and often locally based cleavages.
2. The nature of civil wars prescribes the pervasive involvement of average people, but many have questioned the actual existence of widespread popular support in 'old' wars for the ideological battle.
3. They formed the basis for the majority of the tacit support given to all sides and as a result allow us to question the 'civil' qualities of these 'civil' wars.
4. By considering the micro-level concerns of the peasant populations of Greece and Russia, it can be seen that these divisions had far more to do with economics than with ideology or nationalism.

Sentence 1: Sentence 1 is a grammatically independent sentence (no connectors or pronouns). But, logically, it is incomplete. That is because we do not understand the subject of loyalty here. The context is needed too.
Sentence 2: Sentence 2 offers two ideas – that civil wars involve the average people and secondly, civil wars may not exactly be ideological battles (that the wars took place not because people were battling for ideologies but because people were battling for other reasons). This is again an independent sentence. Nevertheless, it is understandable that 2 and 1 are talking about a similar idea, that civil wars are less to do with impersonal discourses (you should be able to connect this with ideological battles) and more with changing loyalties and needs of average people. 1 is downstream to 2, since 1 is an example.
Sentence 3: Sentence 3 has a pronoun 'they', and while that is ambiguous, a better clue would be 'these civil wars'. So, 3 definitely follows a sentence which has 'civil wars' in it.
Sentence 4: Sentence 4 has to follow a sentence that talks about certain kinds of 'divisions'. So, that indicates that 4 follows 1 because divisions and cleavages are synonyms of each other.
So, it can be understood that 14 is a block, and 2 precedes the block. The only question would be where to place 3. 3 cannot follow 2, however, because then we cannot quite figure out what in 2 could be referred to as 'they'. 2 can be placed after 4, nevertheless, because 'they' can refer to 'these divisions' which formed the basis for majority of the tacit support. Ans: (2143)

Q29. DIRECTIONS for question 29: Five sentences related to a topic are given in the question 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 2013 poll found that Britons thought 24% of the population was Muslim – almost five times the correct figure of 5%.
2. If public misperceptions can distort economic debate, they are also a problem when it comes to financial markets.
3. The polling company Ipsos Mori found that Americans think 33% of the population are immigrants, for example, when the actual number is 14%.
4. On many issues, the gap between public perceptions and reality is very wide.
5. It is not the "unknown unknowns" that catch people out, but the truths they hold to be self-evident that turn out to be completely wrong.

Sentence 1: Sentence 1 gives an example of a wide gap between a British thought/ idea and the reality.
Sentence 2: Sentence 2 has a "If then" sequence and is a negative sentence about public misperceptions.
Sentence 3: Sentence 3 gives an example of a wide gap between an American thought/ idea and the reality.
Sentence 4: Sentence 4 is a standalone sentence.
Sentence 5: Sentence 5 is again a standalone sentence that can serve to begin the paragraph.
Sentences 3 and 1, which cite examples, cannot begin the paragraph. So, sentence 5 is a general sentence that can begin the paragraph. It establishes the background: self-evidents truths that people hold may be wrong. Sentences 5 and 4 form a logical block. "truths they hold to be self-evident that turn out to be completely wrong" in sentence 5 links with "gap between public perceptions and reality is very wide" in sentence 4. So sentence 4 follows sentence 5.
Sentences 3 and 1 then exemplify how the gap between public perceptions and reality is very wide. Since sentence 3 has the clue "for example", it must precede sentence 1.
Sentence 4 (gap between **public perceptions** and **reality** is very wide) is followed by sentence 3 [Americans think 33% of the population are immigrants (**perception**), when the actual number is 14% (**reality**)].
Sentence 3 is followed by another related example in sentence 1. Britons thought 24% of the population was Muslim (**perception**) – almost five times the correct figure of 5% (**reality**). So, 5431.
Sentence 2 is the odd sentence out. The paragraph generally discusses the disconnect between public perception and reality. How public perceptions distort economic debates and financial markets would need a precedent and more substantiation. Sentence 2 can be a part of another paragraph. Ans: (2)

Q30. DIRECTIONS for question 30: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

1. Whiteflies can trick the plant into behaving as if it was threatened with a disease rather than an insect infestation and the plants produce more salicylic acid and less insect-repelling jasmonic acid, making it much easier for them to infest the plant.
2. This hormone triggers the production of compounds that interfere with the fly's digestive enzymes, making it difficult for it to feed.
3. When flies launch an attack, plants usually respond by producing jasmonic acid as a defence mechanism.
4. But plants also can produce a different substance, salicylic acid, to help ward off pathogens, such as a virus.

Sentence 1: Sentence 1 is explanatory in tone. It also assumes that salicylic acid and jasmonic acid have been introduced in a prior sentence.
Sentence 2: Sentence 2 has the demonstrative adjective 'this hormone' and explains how a fly is affected by the hormone.
Sentence 3: Sentence 3 is a general sentence that introduces 'whiteflies' to us. It also tells us how plants respond to the whiteflies.
Sentence 4: Sentence 4 has the conjunction 'but' and it brings in another related context: a plant's defence mechanism against pathogens (viruses). Note that sentence 3 had introduced to us the idea of a plant's defence mechanism against whiteflies.
It must be noted that sentence 1 (producing more salicylic acid) has to be placed after sentence 4 (produce a different substance, salicylic acid).
Sentence 3 talks about a parasitic relation between whiteflies and plant. This can serve as a good standalone and starting sentence. It establishes the background: When whiteflies launch an attack, plants respond ... Sentences 3 and 2 form a logical block. Sentence 2 talks about the effect of jasmonic acid on an insect's digestive system. "This hormone" in sentence 2 links with "jasmonic acid" in sentence 3. "plants respond by producing jasmonic acid as a defence mechanism" in sentence 3 is further elaborated ["triggers the production of compounds that interfere with an insect's digestive enzymes, making it difficult for them to feed"] in sentence 2. So sentence 2 follows sentence 3.
Sentence 4 talks about another/ alternative and known strategy (Now .....) used by plants (against a virus) and follows sentence 2.
Sentence 4 is followed by sentence 1. "as if it was threatened with a disease" in sentence 4 links with "to help ward off pathogens" in sentence 4. "rather than an insect infestation" in sentence 1 links with "whiteflies, which are the most troublesome crop pests, launch an attack on plants" given earlier in sentence 3.
Sentence 1 concludes the paragraph. "dupe plants into producing more salicylic acid and less insect-repelling jasmonic acid" and "behaving as if it was threatened with a disease rather than an insect infestation" are the tricks employed by the whiteflies so as to infect the plants. So, 3241. Ans: (3241)

Q31. DIRECTIONS for question 31: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.
Natural competition is wildly expedient in its moment-to-moment interaction. But it is inherently conservative in the way it changes a species' characteristic behaviour. By contrast, strategic competition is deliberate, carefully considered, and tightly reasoned. But the consequences may well be a radical change in a relatively short period of time. Natural competition is evolutionary. Strategic competition is revolutionary. Natural competition works by a process of low-risk, incremental trial and error. Small changes are tried and tested. Those that are beneficial are gradually adopted and maintained. No need for foresight or commitment, what matters is adaptation to the way things are now. Natural competition can and does evolve exquisitely complex and effective forms eventually. Humans are just such an end result. But unmanaged change takes thousands of generations. Often it cannot keep up with a fast-changing environment and with the adaptation of competitors.

a) Natural competition entails slow, but, certain evolution, while strategic competition entails rapid change, that may or may not be beneficial in the long run.
b) Natural competition gradually builds a stronger system, albeit at a slower rate, compared to strategic competition which renovates the system to suit the needs of the environment.
c) Natural competition is conservative and careful, and works best for complex systems, while strategic competition is radical and reckless, and ideal for nimble systems.
d) Natural competition works on trial and error and incremental changes that slowly help the system evolve, while strategic competition is more suited to a fast-changing environment because of its logically compact but radical changes.

The para distinguishes between natural competition and strategic competition. The first part of the para is about the differences – natural competition is about slow, incremental, tried and tested changes that produce positive results, where strategic changes are radical, although well-reasoned. The second part of the para is about how natural competition is ill-suited for fast-changing environments.
Option A: While most of this option is appropriate, the passage doesn't indicate the last part of the option – that strategic competition may or may not be beneficial in the long run. In fact, that passage only talks about suitability to an environment – and not about benefits in the long run. Hence, Option A is not the answer.
Option B: Strategic competition firstly, doesn't "renovate" the system – it makes radical (read fundamental changes, not cosmetic). Secondly, those changes are not necessarily those which are suited to the needs of the environment. We can infer that these changes are suited to a fast-changing environment particularly. Hence, Option B is not the answer.
Option C: A distinction between complex systems and nimble systems has not been drawn in the para anywhere, no matter what natural or strategic competition might entail. Hence, Option C is not the answer.
Option D: This option represents all the ideas: that natural competition is all about incremental changes through trial and error, and strategic competition is about logically thought-out changes which are radical. Please note that in the para it has been mentioned that the natural competition is not suited for a fast-changing environment. Since, only two types of competition have been compared it can be inferred that strategic competition and its radical changes are better suited for a fast-changing environment. Hence, Option D is the answer. Choice (D)

Q32. DIRECTIONS for question 32: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

1. What looks like a failure is often just the beginning of something else, often something more interesting.
2. The fear from our market-driven culture is that the piece never comes to fruition and "fails."
3. So, what's the worst that could happen if individuals and institutions started funding the roughest sketches of an artist's idea?
4. However, we have seen great examples of this in very public forums.

Sentence 1 is an independent sentence without connectors and pronouns.
Sentence 2 refers to 'the piece' which probably means it is something that has been spoken previously.
Sentence 3 poses a question introducing the idea of individuals and institutions funding an artist's idea. We can also understand that 'the piece' in 2 is probably talking about this idea. So, 2 comes some time later, and not before 3.
Sentence 4 starts with a contrast marker 'however' and also refers to 'this'.
3 and 2 have to be a block since 3 demands a question and 2 talks about a consequence. The 'this' in 4 could refer to the funding in 3, but 'however' prevents that (however needs an opposite idea in front of it).
It is important to note that 3 has a conclusion indicator 'So' which is more rhetorical than an indicator of something derived from the previous sentence. This can be understood from the fact that the para mostly answers the question in 3.
So, 24 has to be a block, because 2 and 4 are contrasting ideas – something failing and a 'great' example. This will be followed by 3 since it continues the positivity with failure turning into something more interesting and which could have many examples.
For the same reason 14 cannot be a block since a great example of failure turning into something interesting wouldn't be introduced with 'however'. Ans: (3241)

Q33. DIRECTIONS for question 33: The paragraph given below is followed by four summaries. Choose the option that best captures the essence of the text.
Different artists are inspired by different objects; what is attractive and stimulating to one is depressing and unattractive to another, and the choice also varies from race to race and epoch to epoch. As to the appreciation of such works, it is the same; for men in general admire only such works as by education or temperament they are predisposed to admire. The classic scholar starts convinced that the art of Greece has never been equalled or surpassed, and never will be; there are many who think, like Michelangelo, that because Italian painting is good, therefore good painting is Italian. There are many who have never yet felt the beauty of Egyptian sculpture or Chinese or Indian painting or music: that they have also the hardihood to deny their beauty, however, proves nothing. The eighteenth century had forgotten the beauty of Gothic sculpture and primitive Italian painting, and the memory of their beauty was only restored by a great effort in the course of the nineteenth. The western appreciation of desert and mountain scenery is also no older than the nineteenth century and artists of the highest rank are often not understood till long after their death.

a) Art is a reflection of humanity, and humanity's greatest virtue is the ability to achieve the highest state of absolute beauty in works of art.
b) The more we consider the variety of human determination seen in works of art, the more we must admit the relativity of taste. A true art critic is able to distinguish works of genuine art from those that are not beautiful.
c) There exists no absolute standard when it comes to appreciating an artwork. That certain works are beautiful can be forgotten or understood only after a very long time.
d) Everyone chooses his love out of the objects of beauty according to his own taste. That which seems to be beautiful to one is described as ugly by another.

Option A: The first part of option A is out of scope. The focus of the para is not on humanity nor does the para suggest that art works need to have the highest state of absolute beauty. The second part about 'absolute beauty' is contradicted by the para. There is relativity of taste when it comes to appreciating works of art.
Option B: While the first sentence in option B appears to be true on reading the first few lines of the paragraph and the examples mentioned, the para does not highlight the role of a true art critic in differentiating genuine art from art that is not beautiful. The focus of the para is on art appreciation and the lack thereof among artists. So option B cannot be the answer.
Option C: ***As to the appreciation of such works, it is the same.*** From the first part of the para, we can understand that there is no general standard or uniform principle when it comes to appreciation of a work of art. From the lines: ***The classic scholar starts convinced that the art of Greece has never been equalled or surpassed, and never will be; there are many who think, like Michelangelo, that because Italian painting is good, therefore good painting is Italian,*** we can understand that greater effort is demanded in appreciating unfamiliar art. ***The eighteenth century had forgotten the beauty of Gothic sculpture and primitive Italian painting, and the western appreciation of desert and mountain scenery is also no older than the nineteenth century and artists of the highest rank are often not understood till long after their death.*** Hence certain works are beautiful can be forgotten or understood only after a very long time. Option C correctly summarises the given para.
Option D: Option D cannot serve as a correct summary of the given para. It is incomplete and restricted to the first few sentences of the text. Choice (C)

Q34. DIRECTIONS for question 34: Five sentences related to a topic are given in the question 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. You don't want to make the utilitarian principle 'Sacrifice others for the greater good' a Kantian universal principle, as someone might want to sacrifice you for some greater good.
2. The 2018 movie Avengers: Infinity War contrasts these two philosophies. Captain America, the heroes' leader, takes up the Kantian position, and Thanos, the villain, takes up the utilitarian position.
3. Immanuel Kant argued that every human being is an 'end in themselves': a basic moral unit who is due basic moral consideration and should never be used merely as a means to other ends.
4. So, this is why people wouldn't usually want to harvest someone's organs.
5. Kant also said that you should act only in such a way that you would be willing to make the principle of your action a universal principle for all moral beings.

Sentence 1 talks about why this particular utilitarian principle shouldn't be turned into a Kantian universal principle.
So, 1 defends 5, which explains what a Kantian universal principle is.
Sentence 2 gives an example of Kantian and Utilitarian philosophies.
Sentence 3 is an independent sentence about Kant's basic argument about human beings being discrete moral units.
Sentence 4 is a conclusion (starting with 'so') with again a specific example.
1 depends on 5 and 5 in turn depends on 3 because 5 uses 'also'. So, 1, 3 and 5 are a logical unit. But 1 explains why people wouldn't want to harvest someone's organs – because we wouldn't want others to harvest our organs for a greater social purpose (basically explaining why we cannot turn the utilitarian principle of sacrifice a Kantian principle).
From this context, 2 feels rather unrequired in the scheme of things and in the overall progression of the idea. 3514 will be the order of the remaining sentences.

Ans: (2)

AIMCAT 2013 LRDI

DIRECTIONS for questions 1 to 4: Answer the questions on the basis of the information given below.
Six teams, A through F, participated in a round robin tournament, in which each team played against each of the other teams exactly once. The tournament was conducted across five days, such that each team played exactly one match on each day.
Each match ended as a win or a loss or a draw. The table below provides information on the results of the matches played by each team. The results for each team are given, from left to right, in the order in which the team played its matches. A 'W' indicates a win; an 'L' indicates a loss and a 'D' indicates a draw.

Team	Results
A	WDLWD
B	LLWLW
C	LWDDD
D	WDLDL
E	LWDWD
F	WLWLD

Q1. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices.
Which of the following teams did A play against on the first day of the tournament?

a) B
b) E
c) C
d) Cannot be determined

Q2. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices.
How many matches did B lose before it played against E?

a) 3
b) 2
c) 1
d) 0

Q3. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices.
How many teams did not lose any match before they played against A?

a) 2
b) 1
c) 0
d) None of the above

Q4. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices. If any team that won against A, B, C, D, E and F were awarded 1, 2, 3, 4, 5 and 6 points, respectively, and no points were awarded in any other manner, how many teams would have been awarded more than 5 points in the tournament?

a) 2
b) 3
c) 4
d) 1

From the given information, on each day, each team played exactly one match. Hence, the first result of each team happened on the first day of the tournament, the second result happened on the second day of the tournament and so on. The given table can be rearranged to reflect the results of the teams on each of the five days as shown below.

Team	Day				
	1	2	3	4	5
A	W	D	L	W	D
B	L	L	W	L	W
C	L	W	D	D	D
D	W	D	L	D	L
E	L	W	D	W	D
F	W	L	W	L	D

On the first day, A, D and F won the matches that they played and B, C and E lost the matches that they played. A, D and F must have played against B, C and E, in any order.
On the second day, the matches played by A and D were the only matches to be drawn. Hence, A played against D on the second day and it ended as a draw.
Similarly, on the third day, C and E played against each other and this match also ended as a draw.
On the fourth day, C and D played against each other and this ended as a draw.
On the fifth day, B was the only team to have won a match and D was the only team to have lost a match. Hence, B and D played against each other on this day, and B won.
Of the matches listed above, D played three matches – against A on Day 2, against C on Day 4, against B on Day 5.
Hence, D has to play against E and F on Day 1 and Day 3 in any order.
By observation, we can see that on Day 1, both D and F won the matches that they played.
Hence, D must have played against E on Day 1 (which was won by D) and played against F on Day 3 (which was won by F).
On Day 3, C and E played against each other, D and F played against each other. Hence, A and B must have played against each other on this day.
On Day 1, A must have played against B or C or E. However, A could not have played against E (as D played against E on Day 1); A could not have played against B (as A played against B on Day 3). Hence, A must have played against C on Day 1.
C has played against A on Day 1, E on Day 3, D on Day 4. C must play against B and F on Day 2 and Day 5, in any order.
C could not have played against B on Day 5. Hence, C must have played against F on Day 5 and B on Day 1.
On Day 5, A must play against E (as they are the only two teams remaining).
Also, A must play against F on Day 4 (the only team against and the only day on which A did not play). On Day 4, the remaining two teams, B and E, must have played against each other.
On Day 2, B and C must have played against each other; E and F must have played against each other.
The following table provides the matches played on each day of the tournament, along with the winner of the match in parenthesis (a '-' indicates a draw):

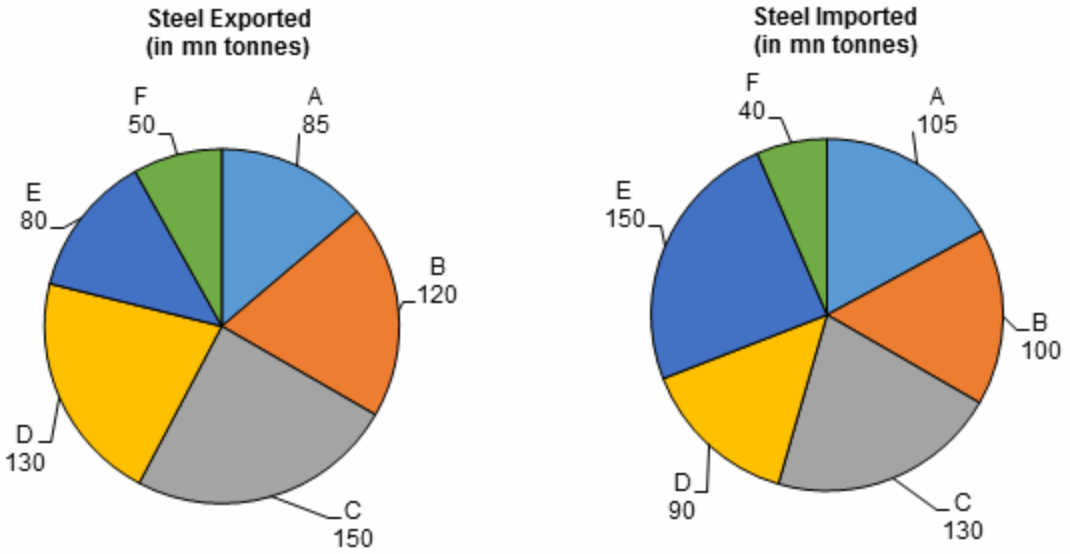
Day 1	Day 2	Day 3	Day 4	Day 5
D – E (D)	A – D (-)	C – E (-)	C – D (-)	B – D (B)
A – C (A)	C – B (C)	D – F (F)	A – F (A)	A – E (-)
B – F (F)	E – F (E)	A – B (B)	B – E (E)	C – F (-)

A would have been awarded 3 + 6 = 9 points
B would have been awarded 1 + 4 = 5 points
C would have been awarded 2 points
D would have been awarded 5 points.
E would have been awarded 6 + 2 = 8 points
F would have been awarded 2 + 4 = 6 points.
Hence, three teams would have been awarded more than 5 points. Choice (B)

DIRECTIONS for questions 5 to 8: Answer the questions on the basis of the information given below.

Six countries, A through F, exported and imported steel only among themselves. Any country can both export and import steel. However, no country can export to any country from which it imports and vice versa.

The following pie charts provide the quantity of steel exported and imported by each of the six countries during a particular year:



Q5. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.

If one of the six countries, say X, exported only to D and another country, say Y, imported only from D, how many distinct possibilities exist for the pair (X, Y)?

a) 10
b) 12
c) 14
d) 15

For any two countries, X and Y, if X exported only to D, then the imports of D must be greater than or equal to the exports of X.

If Y imported only from D, then the exports of D must be greater than or equal to the imports of Y.

Imports of D is 90. Observing the chart for exports, we can see that there are three countries whose exports are less than or equal to 90, i.e., A, E and F. Hence, any of these three countries can be X.

Exports of D is 130. Observing the chart for imports, we can see that there are five countries whose imports are less than or equal to 130, i.e., A, B, C and F. Hence, any of these 4 countries can be Y.

If X is A, then Y can be B, C and F (since any country cannot import and export from the same country). Hence, there are 3 possible pairs for (X, Y).

If X is E, then Y can be A, B, C and F. Hence, there are 4 possible pairs for (X, Y).

If X is F, then Y can be A, B and C. Hence, there are 3 more possible pairs for (X, Y).

Hence, a total of 3 + 4 + 3 = 10 pairs are possible for (X, Y). Choice (A)

Q6. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.
It is known that, each of C, D and E, imported from exactly two countries and exported to exactly two countries. Further, each of C, D and E imported an equal quantity of steel from each country from which it imported steel and exported an equal quantity of steel to each country to which it exported steel.
To which of the following countries did C export steel?

a) A
b) B
c) D
d) F

From the given information, C must have exported 75 tons each to two countries and imported 65 tons each from two countries.
Similarly, D must have exported 65 tons each to two countries and imported 45 tons each from 2 countries.
E must have exported 40 tons each from two countries, and imported 75 tons each from 2 countries.
For each of the above three countries, there must be four distinct countries to/from which these countries can export to or import from. Since there are only a total of six countries, between C, D and E, each of these three countries must have traded with at least one of the other two countries.
For this to happen, the imports of one must be the same as the exports of another.
For E, the imports of E are the same as the exports of C. Hence, C must have exported 75 tons to E. Also, E could not have exported to or imported from D (since the exports and imports of these two countries do not match)
Similarly, for D, the exports of D are the same as the imports of C. Hence, D must have exported 65 tons to C.
Since E and D could not have exported or imported among themselves, they must have imported or exported from each of A, B and F.
Consider E. If E imported from F, it must have imported 75 tons. However, F only exported a total of 50 tons. Hence, E could not have imported from F and must have exported to F.
E must have exported 40 tons to F.
If D exported to F, then it must have exported 65 tons. However, the imports of F is only 40 tons. Hence, D must have imported from F, a quantity of 45 tons.
Now, C can neither export nor import to F (since C has to export 75 tons and import 65 tons from any country and F does not have the necessary quantity of imports or exports).
C must import 65 tons from one of A and B.
D must import 45 tons from one of A and B.
E must import 75 tons from one of A and B.
Hence, two countries (among C, D and E) must import from one of the two countries, A and B, while one country must import from the other country.
The exports of A is 85. Hence, A cannot be exporting to two countries among C, D and E.
The exports of B is 120. Hence, B can export to C and D OR D and E. In either case, B must export to D.
If B is exporting to D, then D must export 65 tons to A.
C must either export 75 tons to or import 65 tons from A. A is importing 65 tons from D. Hence, it cannot import a further 75 tons from C. Hence, C must import 65 tons from A.
Since C is importing from A, it must export 75 tons to B.
E must export 40 tons and import 75 tons from A and B, in any order.
A cannot export 75 tons to E, as A is already exporting 65 tons to C. Hence, E must export 40 tons to A and import 75 tons from B.
The remaining quantities are: A has to export 20 tons; B has to import 25 tons; F has to export 5 tons.
The only possibility for all the three conditions to be satisfied is if B imports 20 tons from A and 5 tons from F.
The following table provides the quantity exported by the country mentioned in the column to the country mentioned in the row. A positive value indicates exports and negative value indicates imports.

		TO					
		A	**B**	**C**	**D**	**E**	**F**
FROM	**A**	X	20	65	-65	-40	0
	B	-20	X	-75	45	75	-5
	C	-65	75	X	-65	75	0
	D	65	-45	65	X	0	-45
	E	40	-75	-75	0	X	40
	F	0	5	0	45	-40	X

C exported Steel to B. Choice (B)

Q7. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.
It is known that, each of C, D and E, imported from exactly two countries and exported to exactly two countries. Further, each of C, D and E imported an equal quantity of steel from each country from which it imported steel and exported an equal quantity of steel to each country to which it exported steel.
What is the quantity of steel (in mn tonnes) that A exported to B?

a) 10
b) 20
c) 30
d) A did not export to B.

From the above solution, A exported 20 tons to B. Choice (B)

Q8. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.
It is known that, each of C, D and E, imported from exactly two countries and exported to exactly two countries. Further, each of C, D and E imported an equal quantity of steel from each country from which it imported steel and exported an equal quantity of steel to each country to which it exported steel.
From which of the following countries did B not import steel?

a) D
b) C
c) F
d) More than one of the above

From the above solution, B did not import steel from D. Choice (A)

DIRECTIONS for questions 9 to 12: Answer the questions on the basis of the information given below.
Five persons, A through E, were standing along a straight line from East to West, not necessarily in the same order. The five persons were facing four different directions, North, South, East and West. The distance between any pair of persons standing immediately next to each other was exactly 10 m. After some time, the five of them walked exactly 10 m along the direction that they were facing.
The following information is known about the distances between them before and after they walked for 10 m:

i. After walking, the distance between A and B was exactly 10 m.
ii. D, who was facing East, was at a distance of exactly 10 m from both B and E, after walking.
iii. No two persons were at the same point after walking.

iv. Before they started walking, B was to the West of E and they were neither facing the same direction nor facing each other.
v. At least one person was facing North and at least one person was facing West.
vi. The distance between E and C decreased after walking but the distance between A and C remained the same

Q9. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices. What is the distance between B and C after walking?

a) 10 m
b) 20 m
c) $10\sqrt{2}$ m
d) $20\sqrt{2}$ m

Q10. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices. Who among the following was standing the closest to A after walking?

a) D
b) E
c) C
d) More than one of the above

Q11. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices. If all of them walked a further 10 m along the respective directions that they were facing, what will be the distance between A and D?

a) 10 m
b) $20\sqrt{2}$ m
c) 20 m
d) $20\sqrt{5}$ m

Q12. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices. If all of them walked a further 10 m along the direction that they were facing, the distance between which of the following pairs of persons will be the highest?

a) A and C
b) A and D
c) C and E
d) C and D

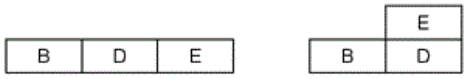
Let 1 to 5 represent the five position along the line, from West to East.
From (ii), D was facing East. Hence, he must have walked East for 10 m. After walking, he was equidistant from both B and E.
If B, D and E were next to each other, in that order, and facing the same direction, then they will be equidistant after walking. But this is not possible from (iv).
B and E cannot be facing each other as well. Hence, they could not have walked along the same line.
Since they can't have walked along the straight line, the only possibilities for their positions after they walked are given below. Let 1 and 2 represent the positions of B and E in any order.

In the first case, 1 can also be below D. In the second case, 2 can also be above D. These variations will depend on whether they are facing North or South.

Case 1:
Consider the first case. We know that D walked along the line towards East. For person 1 to reach the position shown, he must have been in the position where D is shown in the figure. For person 2 to reach there, he must have been either in the place where D is shown in the figure OR he must have been one place East of his position shown in the figure. He cannot be in the place occupied by D in the figure as it must have been occupied by person 1. Hence, before walking, he must have been one place to the East of his position.
In this case, 1 must be B and 2 must be E from (iv).
In the first case, the following is the possibility for their positions before and after walking:

D walked East. E walked West. B walked North. He could also have walked South, in which case, B will be below D.
From (i), the distance between A and B after walking is 10 m. If A was to the West of D or to the East of E, the distance between B and A can never be 10 m. Hence, A must be immediately next to B. A must have walked along the same direction as B. From (vi), the distance between E and C decreased. If C is to the immediate East of E, the distance between them cannot reduce. Hence, C must have been to the West of D. For the distance between A and C to remain the same, they must have moved in the same direction. Hence, A, B and C could have walked South or they could have walked North. From (v), they must have walked North.
The following figures represent their positions before than after they walked:

Case 2:
In the second case, person 2 must have been in the position occupied by D. D must have been in the position occupied by 1. Only then he could have walked East and reach his final position. Person 1 must have occupied the place East of the place shown in the figure. He must also have walked East. From (iv), 1 must be B and 2 must be E.
The following diagram provides their positions before walking:



The distance between A and B is 10 m. A can be to the North or South or West of B. However, for A to be either North or South of B, his initial position must have been the one in which D was there. Hence, A must be to the West of D. The only possibility for this is for A to be to the West of B before walking as well. Hence, A, B and D all walked East. E could have walked North or South.
C cannot be to the East of E before walking. This is because the distance between them cannot decrease to less than 10 m in any case.
Hence, C must be to the West of A. In this case, since the distance between C and A remained the same, C must also have walked East. Hence, A, B, C and D all walked East. However, this case violates condition (v) and hence, is not possible.
Therefore, only one case is possible and this is presented below again:

The distance between C and D will be the highest. Choice (D)

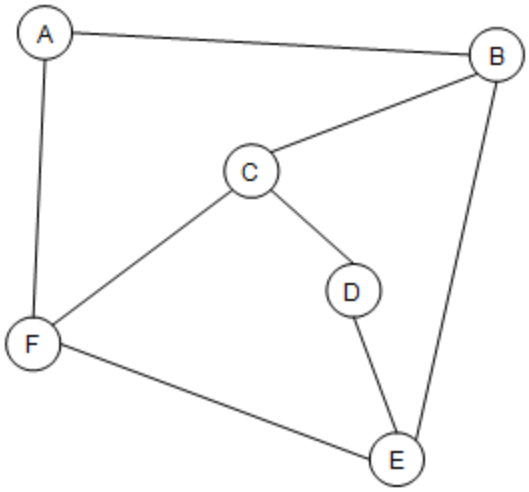
DIRECTIONS for questions 13 to 16: Answer the questions on the basis of the information given below.

Three buses – B123, B345 and B456 – travel between six different stops – A through F. These stops are connected by roads as indicated in the figure below. Each of the three buses travels indefinitely along a different route among the three routes, A – B – C – D – E – F – A, F – E – D – C – B – A – F and B – E – D – C – F – A – B, not necessarily in the same order. Further, any bus while travelling from one stop to the next does not pass through any other stop.

The fare of each bus between any two stops is calculated as the product of the distance between the two stops and a per kilometre fare, which is distinct for the three buses. The distance in kilometres between any two stops is a natural number and the per kilometre fare (in Rs.) is a natural number greater than 2.

On a particular day, ten persons travelled in the three buses. The table below provides, for each of the ten persons, the bus that he travelled on, the stop where he boarded the bus and the stop where he got off the bus and the fare paid by him. It is known that no person travelled through the same stop twice.

Person	Bus	From	To	Fare (in Rs.)
Ram	B123	A	D	42
Tej	B456	D	F	32
Uday	B123	B	E	54
Nitin	B345	B	C	90
Paul	B345	C	B	36
Jai	B123	B	D	36
Sudeep	B456	C	E	24
Lohit	B345	E	C	63
Parvesh	B456	C	A	12
Lalit	B456	D	A	28



Q13. DIRECTIONS for questions 13 and 14: Select the correct alternative from the given choices.

Who among the following would have passed through the maximum number of stops?

a) Ram
b) Tej
c) Nitin
d) Lalit

Q14. DIRECTIONS for questions 13 and 14: Select the correct alternative from the given choices.

What is the minimum distance that any bus will travel when going from D to A?

a) 6 km
b) 7 km
c) 12 km
d) 14 km

Q15. DIRECTIONS for questions 15 and 16: Type in your answer in the input box provided below the question.

If a person travelled from D to F on B123, what is the fare (in Rs.) that he would have paid?

Q16. DIRECTIONS for questions 15 and 16: Type in your answer in the input box provided below the question.

If a person travelled from B to F on B345, what is the fare (in Rs.) that he would have paid?

Given that Ram, Uday and Jai travelled in the same bus. The amount that each person paid depends on the distance that he travels. Since Ram paid ₹42, Uday paid ₹54 and Jai paid ₹36, Uday must have travelled for a longer distance than Ram, who, in turn, must have travelled for a longer distance than Jai. Jai travelled from B to D, while Ram travelled from A to D. This is only possible if this bus follows the route A – B – C – D – E – F – A. In the other routes, the distance from B to D is more than the distance from A to D.

Similarly, for B456, the distance from D to F (travelled by Tej) must be greater than the distance between D to A (travelled by Lalit). The only route for which this is possible is F – E – D – C – B – A – F.

Hence, the route of B345 must be B – E – D – C – F – A – B.

For B123, the per kilometer fare for the persons who travel on this bus will be the same. Since the three persons who travelled on this bus paid ₹42, ₹54 and ₹36, the per kilometer fare must be a factor of these three numbers. Hence, the per kilometer fare can be ₹3 or ₹6 (since the per kilometer fare must be greater than 2).

Similarly, for B456, the fares paid by the persons who travelled on this bus are ₹32, ₹24 and ₹12. Except 4, There are no common factors of these numbers which are greater than 2. Hence, **the per kilometer fare of B456 must be 4.**

For B456, the distance between D and F must be 32/4 = 8 (since the per kilometer fare is ₹4).

Hence, DC + CB + BA + AF = 8.

Also, the distance between C and E must be 24/4 = 6.

Hence, CB + BA + AF + FE = 6.

The distance between C and A must be 12/4 = 3.

Hence, CB + BA = 3.

The distance between D and A must be 28/4 = 7.

DC + CB + BA = 7.

Since CB + BA = 3, **DC = 4**. Since DC = 4, form the first equation, **AF = 1**.

From the second equation, **FE = 2**.

The route taken by B123 for travelling from A to D is AB + BC + CD.

We know that AB + BC = CB + BA = 3. Also, CD = 4.

Hence, AB + BC + CD = 7.

∴ **The per kilometer fare of B123 must be ₹6.**

The distance between B and E = 54/6 = 9.

Hence, BC + CD + DE = 9.

The distance between B and D is 36/6 = 6.

Hence, BC + CD = 6.

From the above two equations, we get **DE = 3**. Since CD = 4, **BC = 2**. Since BC = 2 and BC + BA = 3, **AB = 1**.

For B345, the fare paid for travelling between E and C is ₹63.

The distance travelled by the bus = ED + DC.

Since ED = 3 and DC = 4, ED + DC = 7.

Hence, **the per kilometer fare of B345 is 63/7 = 9.**

The distance between C and B is 36/9 = 4.

Hence, CF + FA + AB = 4.

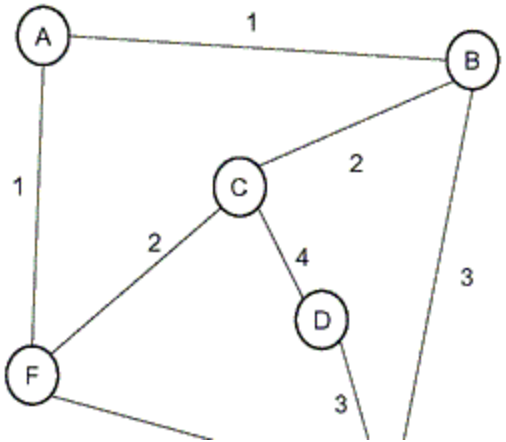
Since FA = 1 and AB =1 , **CF = 2**.

Also, the distance between B and C is 90/9 = 10.

Hence, BE + ED + DC = 10.

Since DE = 3 and CD = 4, **BE = 3**.

The following diagram provides the distances of the routes:



DIRECTIONS for questions 17 to 20: Answer the questions on the basis of the information given below.

Ten runners – Jai, Gautam, Hari, Chetan, Farhan, Amar, Balu, Eswar, Dinesh and Indrajit – participated in a race such that the ten persons started the race one behind the other. Their positions at the beginning of the race was in the order mentioned above, with Jai at the front and Indrajit at the back. During the race, exactly five runners overtook other runners in the race, i.e., no runner other than these five overtook any other runner.

The following table provides the number of times each of the five runners overtook another runner during the race:

Runner	Number of times Overtook
Balu	2
Chetan	4
Dinesh	5
Amar	1
Indrajit	3

Q17. DIRECTIONS for questions 17 to 19: Type in your answer in the input box provided below the question.

How many runners would have finished the race before Dinesh?

Q18. DIRECTIONS for questions 17 to 19: Type in your answer in the input box provided below the question.

What is the maximum number of runners who would have finished the race before Balu?

Q19. DIRECTIONS for questions 17 to 19: Type in your answer in the input box provided below the question.

How many of the following can be the seventh runner to finish the race?

I. Amar II. Balu III. Farhan IV. Indrajit

Q20. DIRECTIONS for question 20: Select the correct alternative from the given choices.

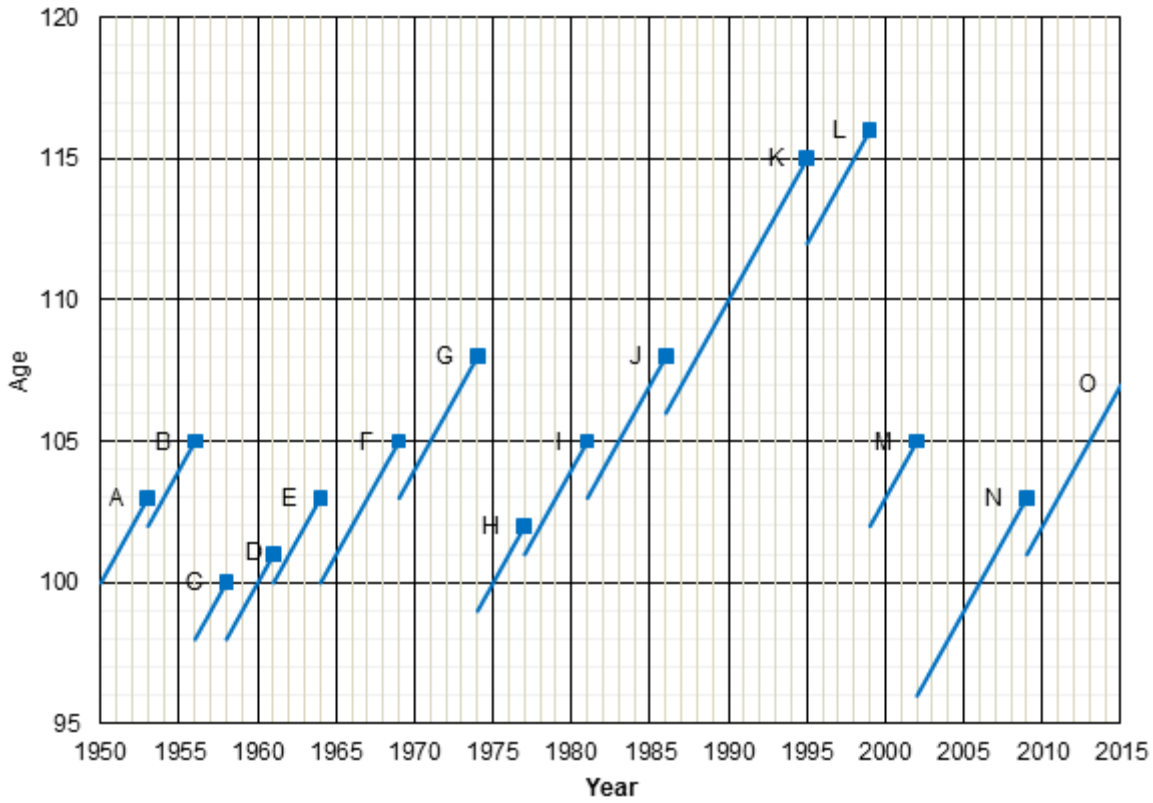
In which of the following positions would Farhan definitely not have finished the race?

a) 6^{th}
b) 7^{th}
c) 8^{th}
d) 9^{th}

Given that Chetan overtook a runner four times during the race. But there are only three persons in front of him at the beginning of the race. This implies that one of the persons behind Chetan must have overtaken him.
Amar, Balu and Indrajit could not have been the persons who overtook Chetan (since they overtook 1, 2 and 3 times respectively).
Only Dinesh could have overtaken Chetan. Indrajit could not have overtaken Dinesh because, if Indrajit overtook Dinesh, Dinesh will have to overtake six persons to move in front of Chetan. Hence, Dinesh would have overtaken Eswar, Balu, Amar, Farhan and Chetan (Dinesh could have overtaken Eswar, Balu, Amar, Farhan in any order because Amar and Balu might have overtaken others before Dinesh). Chetan can overtake four persons to move to the first position.
The positions of the first five runners (which will not change further) are Chetan, Jai, Gautam, Hari, Dinesh.
The positions of the last five runners will vary depending on the order in which each runner overtook another runner.

Four persons would have finished the race before Dinesh. Ans: (4)

DIRECTIONS for questions 21 to 24: Answer the questions on the basis of the information given below.
The chart given below provides the age of the oldest person alive during each year between 1950 and 2015, in a certain country. Each line in the chart indicates a different person. Further, the beginning of each line indicates the year in which the person became the oldest person alive, while the end of the line (indicated by a square) indicates the year in which the person had passed away.
During the given period, a total of 15 persons (indicated in the graph with the labels A through O) became the oldest person alive at any point of time.



Note: Assume that, for any person, the age of the person mentioned in the graph is his/her age at the beginning of that calendar year.

Q21. DIRECTIONS for question 21: Type in your answer in the input box provided below the question.

Among the given persons, how many persons were alive and were more than 80 years old, immediately after E became the oldest person alive?

E became the oldest person alive in the year 1961.
Any person who was at least 100 years of age in 1980, will be more than 80 years of age in 1961.
By observation, we can see that F, G, H, I and J are more than 100 years by 1981. All these persons will be more than 80 years of age in 1961.
Also, K was 106 years of age in 1986. Hence, he must have been 81 years of age in 1961.
Checking for L, we can see that L is not more than 80 years old in 1961.
Hence, a total of 7 persons (E, F, G, H, I, J and K), are more than 80 years old in 1961. Ans: (7)

Q22. DIRECTIONS for question 22: Select the correct alternative from the given choices.

The difference between the years of birth of which of the following pairs of persons is maximum?

a) F, M

b) G, N
c) E, L
d) D, K

The difference in the years of birth of any two persons is the same as the difference between their ages in any year or the difference between the years in which they attain the same age.
Option A: F was 105 years in 1969, while M was 105 years in 2002. The difference in their years of birth will be 2002 – 1969 = 33
Option B: G was 103 years in 1969, while N was 103 years old in 2009. The difference in their years of birth = 2009 – 1969 = 40
Option C: E was 100 years old in 1961. Hence, he must have been born in 1861. L was 112 years old in 1995. Hence, L must have been born in 1883.
The difference in their years of birth = 1883 – 1861 = 22
Option D: D was 100 years old in 1960. Hence, D must have been born in 1860. K was 110 years old in 1990. Hence, K must have been born in 1880. Required difference = 1880 – 1860 = 20.
Hence, the difference is the maximum for G and N. Choice (B)

Q23. DIRECTIONS for question 23 Type in your answer in the input box provided below the question.
If the difference between the years of birth for any pair of persons who became the oldest persons alive, one immediately after the other, is x, what is the maximum possible value of x?

For each pair of persons who became the oldest person alive one immediately after the other, the vertical drop between the end of one line and the beginning of the next line indicates the difference in the year of birth (as mentioned in the previous solution).
This drop is the highest for L and M, which is equal to 14 years.
Hence, the maximum possible value of x = 14. Ans: (14)

Q24. DIRECTIONS for question 24: Select the correct alternative from the given choices.
When H became the oldest person alive, what is the average of the ages (in years) of all the persons who were alive at that point of time?

a) 85.375
b) 85.5
c) 86.125
d) 87.25

H became the oldest person alive in the year 1974.
All the persons who became the oldest person alive after H were all alive in 1974.
H was 99 years old in 1974.
From the graph we can see that I was one year younger than H. Hence, I must have been 98 years old in 1974.
J was two years younger than I. Hence, J must have been 96 years old in 1974.
K was two years younger than J. Hence, K must have been 94 years old in 1974.
L was three years younger than K. Hence, L must have been 91 years old in 1974.
M was 14 years younger than L. Hence, M must have been 77 years old in 1974.
N was 9 years younger than M. Hence, N must have been 68 years old in 1974.
O was two years younger than N. Hence, O must have been 66 years old in 1974.
The average age of all the above persons $= \frac{99 + 98 + 96 + 94 + 91 + 77 + 68 + 66}{8}$
$= 86.125\ years$ Choice (C)

DIRECTIONS for questions 25 to 28: Answer the questions on the basis of the information given below.
Nine persons, P through X, belong to the same family, spread across three generations. Among the nine persons, there are three persons with a blood group A, two persons with a blood group B, one person with a blood group AB and three persons with a blood group O. It is known that any male in the family has the same blood group as his mother, while any female in the family has the same blood group as her father.
The following information is known about the family:

i. There are exactly three married couples in the family and the others are unmarried. Every married couple has at least one child.
ii. No two siblings have the same blood group.
iii. P, whose blood group is B, is a female, while Q, whose blood group is AB, is not married to W.
iv. R, who is a male, has two children, and the blood group of R is A.
v. T is younger than U, and both of them are females having the same blood group.
vi. X is older than S, and both of them are males having the same blood group.

Q25. DIRECTIONS for questions 25 to 28: Select the correct alternative from the given choices.
Who among the following is the son of R?

a) T
b) W
c) S
d) None of the above

Q26. DIRECTIONS for questions 25 to 28: Select the correct alternative from the given choices.
What is the blood group of the father of S?

a) A

b) B
c) O
d) AB

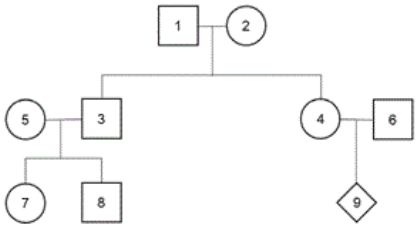
Q27. DIRECTIONS for questions 25 to 28: Select the correct alternative from the given choices.
Who among the following has blood group O and has at least one child?

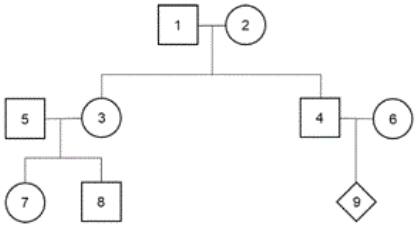
a) T
b) S
c) V
d) U

Q28. DIRECTIONS for questions 25 to 28: Select the correct alternative from the given choices.
Who among the following is the son of U?

a) R
b) T
c) X
d) None of the above

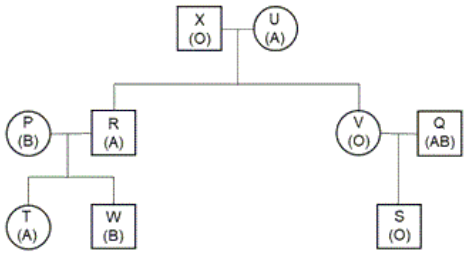
Given that every male has the same blood group as his mother, while every female has the same blood group as her father.
Also, every married couple has at least one child. Hence, there cannot be any married couples in the third generation (as there are no members in the fourth generation).
Also, no two siblings have the same blood group. Since every child can have the blood group of either the mother or the father, no married couple can have more than two children.
Since there are three married couples, there should be a married couple in the first generation. This couple must have two children, one male and one female. Each of these children must be married. One of the couples must have two children, while the other must have only one child.
Hence, there are two possible cases: the male child of the grand parents can have two children OR the female child of the grandparents can have two children. In each case, the other child must have one child. The two cases are given below (the rhombus indicates that the gender of the person is not known).





First Case:
In the first case, the blood group of the grandmother (2), her son (3) and the son's daughter (7) must be the same. The blood group of the grandfather (1) and his daughter (4) must be the same. The blood group of 9 can be the same as that of 4 or 6. The blood group of 8 must be the same as that of 5.
However, three persons have a blood group of A and three have a blood group of O. For this to be satisfied, the blood group of 9 must be the same as that of 4. Hence, 9 must be a male (since his blood group is the same as his mother's).
Therefore, (2, 3, 7) must have blood group of A or O, while (1, 4, 9) must have blood group of A or O. (5, 8) also have the same blood group.
Also, the only person whose blood group is unique is 6. Hence, his blood group must be AB. From (iv), this must be Q.
Also, there must be exactly two persons whose blood group is B. These two persons must be 5 and 8. Hence, the blood group of these two persons must be B. From (iv), 5 must be P.
From (vi), T and U are both females and have the same blood group. This is possible only if they are grandmother and grand daughter. Hence, T and U must be 2 and 7 in any order. Since T is younger than U, T must be 7 and U must be 2.
Also, X and S are both males and have the same blood group. This is possible only if they are grandfather and grandson. Hence, X and S must be 1 and 9 in any order. Since X is older than S, X must be 1 and S must be 9.
From (v), R is a male, whose blood group is A. Hence, R must be 3 and the blood group of 2, 3 and 7 must be A, while the blood group of 1, 4 and 9 must be O.
Also, from (iv), Q is not married to W. Hence, 4 must be V, while 8 must be W.

Second Case:
In the second case, (1, 3, 8) must have the same blood group; (2, 4, 9) must have the same blood group. Hence, 9 must be a female. (5, 7) must have the same blood group.
Since two persons have blood group B, (5, 7) must have B. Also, only one person has AB blood group. Hence, 6 must have AB and must be Q.
From (vi), T and U must be 2 and 9, while from (vii), X and S must be 1 and 8.
In this case R must be 5. However, if R is 5, R must have B blood group. However, it is given that R has A blood group. Hence, this is not possible.
Therefore, only the first case is possible, and this is presented below:



R is the son of U. Choice (A)

Q29. DIRECTIONS for questions 29 to 32: Select the correct alternative from the given choices.
If Y scored 80 or more marks in subject C, then which of the following must be true?

a) Y scored 80 or more marks in subject E.
b) Z scored 80 or more marks in subject B.
c) Z scored 80 or more marks in subject E
d) X scored 80 or more marks in subject E.

From (i) and (ii), X, Y and Z scored 80 or more marks in 1, 2, and 4 subjects in any order.
From (iii) and (iv), X scored less than 80 marks in subjects A, D, G and F.
∴ X did not score 80 or more marks in four subjects.
From (iv) and (v), one student cannot score 80 or more in both the subjects, B and E, and same is the case for the subjects A and C. Also one student scored 80 or more in D and F.
From (vi), either X or Z scored 80 or more marks in subject B.

Given Y scored 80 or more marks in C
⇒ Y scored less than 80 marks in A.
⇒ Z scored 80 or more marks in A
Now X could have scored 80 or more marks in B or E i.e., only one subject.

Case (i):
If X scored 80 or more marks in B.
As Z scored 80 or more marks in A and G, he could have scored 80 or more marks in zero or two more subjects.

Case (i) (a):
When zero more subjects, Y scored 80 or more marks in D, E and F.
The distribution is as follows:
X – B
Y – CDEF
Z – AG

Case (i) (b):
When two more subjects, Z scored 80 or more marks in D and F.
⇒ Y scored 80 or more marks in E.
The distribution is as follows.
X – B
Y – CE
Z – ADFG

Case (ii):
If X scored 80 or more marks in E, Z scored 80 or more marks in B.
⇒ Z scored 80 or more marks in 4 subjects i.e., A, B, G and one more subject among D and F, which is not possible as the same student scored 80 or more marks in both D and F.
∴ In both case (i) (a) and case (i)(b), Y scored 80 or more marks in E.

Choice (A)

Q30. DIRECTIONS for questions 29 to 32: Select the correct alternative from the given choices.
A student can score 80 or more marks in each of the following sets of subjects except

a) A, E, F.
b) A, G, E.
c) A, F, G.
d) C, G, D.

From (i) and (ii), X, Y and Z scored 80 or more marks in 1, 2, and 4 subjects in any order.
From (iii) and (iv), X scored less than 80 marks in subjects A, D, G and F.
$\therefore$ X did not score 80 or more marks in four subjects.
From (iv) and (v), one student cannot score 80 or more in both the subjects, B and E, and same is the case for the subjects A and C. Also one student scored 80 or more in D and F.
From (vi), either X or Z scored 80 or more marks in subject B.

Choice (A), AEF $\Rightarrow$ AEFD
This has to be Y (as Z got 80 or more in G). Hence X got 80 or more marks in B and C, is one of the possible cases.
Choice (B), AGE
This has to be Z, which hence has four subjects of 80 or more marks.
$\therefore$ Y scored 80 or more marks in D and F. Of the remaining subjects (i.e., B and C), Z could not have got 80 or more marks in any subject. Hence Z has 80 or more marks in only three subjects, which is contradiction.
Choice (C), AFG $\Rightarrow$ ADFG
This has to be Z, and X scored 80 or more marks in B, Y scored 80 or more marks in C and E is a possible case.
Choice (D), CGD $\Rightarrow$ CGDF
This has to be Z, and X scored 80 or more marks in B, Y scored 80 or more marks in A and E is a possible case. Choice (B)

Q31. DIRECTIONS for questions 29 to 32: Select the correct alternative from the given choices.
If Z scored 80 or more marks in subject B and less than 80 marks in subject D, then what could be the highest percentage of marks scored by Y? (Assume the maximum marks in each subject as 100)

a) 91%
b) 87%
c) 82%
d) 85%

From (i) and (ii), X, Y and Z scored 80 or more marks in 1, 2, and 4 subjects in any order.
From (iii) and (iv), X scored less than 80 marks in subjects A, D, G and F.
∴ X did not score 80 or more marks in four subjects.
From (iv) and (v), one student cannot score 80 or more in both the subjects, B and E, and same is the case for the subjects A and C. Also one student scored 80 or more in D and F.
From (vi), either X or Z scored 80 or more marks in subject B.

As Z scored 80 or more marks in B and less than 80 marks in D, Y scored 80 or more marks in D and also in F. Of the remaining subjects (i.e., A, C and E), Z did not get 80 or more marks in E and also he could have got 80 or more marks in at most one of A and C. Hence Z did not get 80 or more marks in four subjects and Y got 80 or more marks in four subjects.
To maximize the score of Y, for subjects of 80 or more marks, a maximum of 100 marks is possible and for subjects of less than 80 marks, a maximum of 79 marks is possible.

∴ Required percentage = $\frac{4\times100+3\times79}{7\times100}\times100 = 91\%$ Choice (A)

Q32. DIRECTIONS for questions 29 to 32: Select the correct alternative from the given choices.
Which of the following could be an accurate matching of subjects and students who scored 80 or more marks in it?

a) A − X, B − Y, C − Z
b) E − X, A − Y, C − Z
c) C − X, A − Y, E − Z
d) F − X, C − Y, B – Z

From (i) and (ii), X, Y and Z scored 80 or more marks in 1, 2, and 4 subjects in any order.
From (iii) and (iv), X scored less than 80 marks in subjects A, D, G and F.
∴ X did not score 80 or more marks in four subjects.
From (iv) and (v), one student cannot score 80 or more in both the subjects, B and E, and same is the case for the subjects A and C. Also one student scored 80 or more in D and F.
From (vi), either X or Z scored 80 or more marks in subject B.

By observing the choices and all the possibilities, we can say that (A), (B) and (D) are not possible.
Only choice (C) is possible. Choice (C)

AIMCAT 2013 QA

Q1. DIRECTIONS for questions 1 to 3: Type in your answer in the input box provided in the question.
The minimum number of straight lines required to obtain 16 non-overlapping parallelograms is

A set of 5 parallel lines intersecting with another set of 5 parallel lines gives 16 non-overlapping parallelograms. So the minimum number of lines required to get 16 non-overlapping parallelograms is 5 + 5 = 10. Ans: (10)

Q2. DIRECTIONS for questions 1 to 3: Type in your answer in the input box provided in the question.
A book has 120 pages. A certain number of consecutive leaves are torn from the book. The sum of the page numbers on the remaining pages is 6215. The number of leaves which are torn from the book can be at most

Each leaf is two pages.
Let the number of leaves which are torn from the book be N.
Number of pages which are torn from the book is 2N.
As consecutive leaves are torn, the page numbers on the leaves torn form an AP whose common difference is 1.
Sum of the page numbers on the remaining pages is 6215.
Sum of the page numbers on the leaves torn

$$= \frac{120(121)}{2} - 6215 = 1045.$$

Let a be the first page number on the torn leaves.

$$1045 = \frac{2N}{2}[2a + (2N - 1)(1)]$$

$$1045 = N[2a + 2N - 1] \quad \ldots. (1)$$

$a \geq 1. \Rightarrow 2a + 2N - 1 \geq N$
We can rewrite (1) as follows
$N(2a + 2N - 1) = 1045 = 5(209) = 5(11)(19)$
$= 1(1045)$
$= 5(209)$
$= 11(95)$
$= 19(55)$
The maximum value of N is 19. Ans: (19)

Q3. DIRECTIONS for questions 1 to 3: Type in your answer in the input box provided in the question.
If $(1012)_5 = (246)_x$, then x =

$(1012)_5 = (246)_x$
$1 \times 5^3 + 0 \times 5^2 + 1 \times 5^1\ 2 \times 5^0 = 2x^2 + 4x + 6$
$125 + 0 + 5 + 2 = 2x^2 + 4x + 6$
$2x^2 + 4x + 6 - 132 = 0$
$2x^2 + 4x - 126 = 0$
$x^2 + 2x - 63 = 0$
$x^2 + 9x - 7x - 63 = 0$
$(x + 9)(x - 7) = 0$
$x = -9$ or $x = 7$
Since x is always positive,
$\therefore x = 7$ Ans: (7)

Q4. DIRECTIONS for questions 4 to 6: Select the correct alternative from the given choices.
If n > 5, then find the remainder when $7^n - 6n(3n - 2) - 7$ is divided by 216.

a) 43
b) 1
c) 210
d) Cannot be determined

$7^n = (6 + 1)^n = 1 + 6n + {}^nC_2(36) + 216[{}^nC_3 + {}^nC_4(6) + \text{-------} + {}^nC_n(6)^{n-3}]$
$= 1 + 6n + 36\frac{n(n\ \ 1)}{2} + 216[{}^nC_3 + {}^nC_4(6) \text{ ------ } + {}^nc_n(6)n - 3]$
$\therefore 7^n - 6n(3n - 2) - 7$
$1 + 6n + 18n^2 - 18n + 216(K) - 18n^2 + 12n - 7 = 216(K) - 6$
Now, when $216(K) - 6$ is divided by 216 the remainder is 210.

Alternative Solution:

Though the question says n > 5, one could figure out (or guess) that the condition that n > 5 is not significant. Hence, by trying n = 0, 1, 2, one can figure out that option (C) fits. Choice (C)

Q5. DIRECTIONS for questions 4 to 6: Select the correct alternative from the given choices.
The population of a country increased by 60% from the year 1970 to the year 2010. If the percentage increase in the population of the country from 1970 to 1990 was 25%, then find the percentage increase in the population of the country from 1990 to 2010.

a) 20%
b) 24%
c) 28%
d) 30%

Let the population in 1970 be x.

$\Rightarrow$ the population in 2010 = $1.6x = \frac{8}{5}x$.

Also, the population in 1990 = $1.25x = \frac{5}{4}x$

$\therefore$ The required percentage increase

$$= \frac{\left(\frac{8}{5}\right) - \left(\frac{5}{4}\right)}{\left(\frac{5}{4}\right)} = \frac{7}{25} = 28\%$$

Choice (C)

Q6. DIRECTIONS for questions 4 to 6: Select the correct alternative from the given choices.
A rectangular tank has a height of h. It is fitted with two inlet pipes which can fill it in 6 hours and 12 hours respectively. An emptying pipe which can empty the tank in 16 hours is fitted at a height of $\frac{h}{4}$. If all the three pipes are opened simultaneously, find the time taken to fill the tank.

a) 6 hours
b) 5.5 hours
c) 4.5 hours
d) 5 hours

The two inlet pipes are as good as an inlet pipe which can fill $\frac{1}{6} + \frac{1}{12}$ or $\frac{1}{4}$ th of the tank in a hour i.e. an inlet pipe which can fill the tank in 4 hours.

The emptying pipe will not affect the filling of the bottom $\frac{1}{4}$th of the tank.

$\therefore$ Time taken to fill this part = $\left(\frac{1}{4}\right)(4)$ or 1 hour.

Time taken to fill the top $\frac{3}{4}$th of the tank

$$= \frac{1}{\frac{1}{\frac{3}{4}.4} - \frac{1}{\frac{3}{4}.16}} = \frac{1}{\frac{1}{3} - \frac{1}{12}}$$ or 4 hours

The total time taken to fill the tank = 5 hours

Choice (D)

Q7. DIRECTIONS for questions 7 to 10: Type in your answer in the input box provided below the question.

The p^{th} term and $(p + 2)^{th}$ term of an arithmetic progression are in the ratio p : (p + 2). The sum of the first 2p terms of the arithmetic progression and the sum of the first 3p terms of the arithmetic progression are in the ratio 14 : 31. Find the value of p.

Given $\frac{a+(p-1)d}{a+(p+1)d} = \frac{p}{p+2}$

$\Rightarrow 2d = 2a \quad \Rightarrow a = d$. Let $a = d = 1$.

$\frac{2p(2p+1)}{3p(3p+1)} = \frac{14}{31} \quad \Rightarrow 124p + 62 = 126p + 42$

$\Rightarrow 2p = 20 \Rightarrow p = 10$ Ans: (10)

Q8. DIRECTIONS for questions 7 to 10: Type in your answer in the input box provided below the question.

Two trains, of lengths 500 m and 300 m respectively, run on parallel tracks. When the trains run in the same direction, the faster train takes 80 seconds to cross the slower train. When they run in opposite directions, they take 20 seconds to cross each other. Find the speed (in km/hr) of the slower train.

Let the speeds of trains be x m/sec and y m /sec, where x > y.

$\frac{500 + 300}{x - y} = 80$

$\Rightarrow x - y = 10$ __ (1)

and $\frac{500 + 300}{x + y} = 20$

$\Rightarrow x + y = 40$ ___ (2)

Solving (1) and (2),

x = 25 m/sec and y = 15 m/sec

$\therefore$ Speed of slower train = $15 \times \frac{18}{5}$ = 54 km/hr Ans: (54)

Q9. DIRECTIONS for questions 7 to 10: Type in your answer in the input box provided below the question.

If the roots of the equation $x^3 - ax^2 + bx - c = 0$ are in the ratio 2 : 4 : 5, and c = 320, find the value of b.

Let the roots be 2k, 4k and 5k.
$\therefore (x - 2k)(x - 4k)(x - 5k)$
$= x^3 - x^2(5k + 4k + 2k) + x(20k^2 + 8k^2 + 10k^2 - 40k^3)$
$= x^3 - 11kx^2 + 38k^2x - 40k^3$
But the given equation is
$x^3 - ax^2 + bx - c = 0$
$\therefore c = 40k^3 = 320$
$\Rightarrow k^3 = 8 \Rightarrow k = 2$
$\therefore b = 38k^2 = 38(4) = 152$ Ans: (152)

Q10. DIRECTIONS for questions 7 to 10: Type in your answer in the input box provided below the question.

If $x, y, z > 0$, $x + y + z = 9$ and $f(x) = \frac{9}{x} - 1$, find the minimum value of $f(x).\ f(y).\ f(z)$.

$$f(x) = \frac{9}{x} - 1$$

$$f(y) = \frac{9}{y} - 1$$

$$f(z) = \frac{9}{z} - 1$$

$$f(x).\ f(y).\ f(z) = \left(\frac{9}{x} - 1\right)\left(\frac{9}{y} - 1\right)\left(\frac{9}{z} - 1\right)$$

$$= \left(\frac{9 - x}{x}\right)\left(\frac{9 - y}{y}\right)\left(\frac{9 - z}{z}\right)$$

$$= \frac{729 - 81(x + y + z)}{xyz} + 9\left(\frac{1}{z} + \frac{1}{x} + \frac{1}{y}\right) - 1$$

$$= \frac{729 - 81 \times 9}{xyz} + 9\left(\frac{1}{z} + \frac{1}{x} + \frac{1}{y}\right) - 1$$

Now, as A.M ≥ H.M

$$\frac{9\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right)}{3} \geq \frac{3}{\frac{x}{9} + \frac{y}{9} + \frac{z}{9}} = 3$$

$$\Rightarrow 9\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right) \geq 9$$

$\therefore f(x).\ f(y).\ f(z) = \geq (9 - 1)$, i.e., 8.

Alternative solution:

The minimum is achieved when $x = y = z = 3$. Then $\left(\frac{9}{3} - 1\right)\left(\frac{9}{3} - 1\right)\left(\frac{9}{3} - 1\right) = 8$

Ans: (8)

Q11. DIRECTIONS for questions 11 and 12: Select the correct alternative from the given choices.

In a certain company, the managers constitute 20% of the workforce by number and receive 80% of the total salary paid. On the other hand, the clerks constitute 80% of the workforce by number and receive 20% of the total salary paid. The salary of all the managers is equal and the salary of all the clerks is also equal. If the company hires a few managers and clerks after which the total salary paid to managers becomes twice that paid to the clerks, what is the minimum number of clerks hired, given that at least one new manager was hired?

a) 6
b) 8
c) 12
d) 16

Let the number of Managers be x, then the number of clerks will be 4x. Let the salary of each Manager be m and that of each clerk be c.

$x\,m = 4\,(4x)\,c \Rightarrow \frac{m}{c} = \frac{16}{1}$

Let y be the number of new managers hired and z be the new clerks hired.

The new ratio of total salary of Managers to clerks is $\frac{(x+y)m}{(4x+z)c} = \frac{2}{1}$.

For the new clerks hired to be minimum in number, the number of existing managers and newly hired managers should be the minimum possible.

Thus x = 1 and y = 1.

$\frac{2m}{(4+z)c} = \frac{2}{1}$

$\Rightarrow \frac{32c}{(4+z)c} = \frac{2}{1}$ ($\because$ m = 16 c)

$\Rightarrow 8 + 2z = 32$

$\Rightarrow z = 12.$

Choice (C)

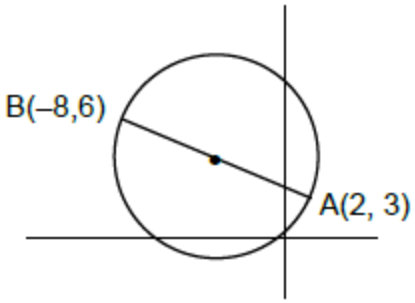
Q12. DIRECTIONS for questions 11 and 12: Select the correct alternative from the given choices.

How many integral values of x satisfy the inequality $\frac{(2x+2^2)(4x+4^2)\ldots.(10x+10^2)}{(12^2-12x)(14^2-14x)\ldots.(20^2-20x)} < 0$?

a) 4
b) 5
c) 9
d) None of the above

The inequality is of the form $P < 0$.
In all such inequalities we need not distinguish between the factors in the numerator and denominator. There are 10 factors on the LHS, in 5 of which the coefficient of x is negative. We can multiply the inequality by –1 and get $Q > 0$. Now the coefficient of x in all the 10 factors is positive.
When you consider a case where all the factors are positive (or negative), LHS > 0 and there are infinite integer values of x, for which this is possible. Choice (D)

Q13. DIRECTIONS for question 13: Type in your answer in the input box provided below the question.
If A and B are two points in the x-y plane such that A = (2, 3) and B = (–8, 6) and P is a point such that $\angle APB = \frac{\pi}{2}$ and the area of ΔAPB is 24, then how many such points P exist in the x-y plane?



The locus of P such that $A\hat{P}B = 90°$ is the circle with AB as a diameter. The area of ΔAPB would vary from 0 to r^2 where r is the radius of the circle. Here, the radius is given by $(2r)^2 = [2-(-8)]^2 + (3-6)^2 = 109$

$\therefore r^2 = \frac{109}{4} = 27.25$

As the area of the triangle APB has to be 24, there would be 4 points – two on either side of AB. Each of these points would be $\frac{48}{\sqrt{109}}$ units away from AB.

(If the area of ΔAPB was given as 27.25, then there would be only 2 points, one on either side). Ans: (4)

Q14. DIRECTIONS for questions 14 and 15: Select the correct alternative from the given choices.
A, B and C are three integers between 0 and 9, both inclusive, such that A! + B! + C! = ABC (where ABC is a three-digit number and not A × B × C). What is the sum of the values of A, B and C?

a) 8
b) 10

c) 9
d) 17

The required value, i.e., A! + B! + C! is 3-digit.
7!, 8!, 9! have 4 or more digits. Hence they need not be considered.
6! = 720, and this is 3-digit; because it is given that A! + B! + C! = ABC. The value of one of A or B or C has to be 7; and then the same will have more than 3 digits. Hence, 6! is out of consideration.
5! = 120, and is 3-digit. This could be one of the numbers.
4! = 24; and when this is added to 5!, the value is 144 which is 3-digit.
As the sum is 144, 1! has to be taken into account. Then 1! + 4! + 5! = 1 + 24 + 120 = 145 and the given condition is satisfied. A + B + C = 1 + 4 + 5 = 10. Choice (B)

Q15. DIRECTIONS for questions 14 and 15: Select the correct alternative from the given choices.

If x is real and $\left|\log_{(2x+3)}(3x-1)\right| = 1$, then find the number of possible values of x.

a) 0
b) 1
c) 2
d) 3

$\log_{(2x+3)}(3x-1) = \pm 1$
If $\log_{(2x+3)}(3x-1) = 1$
$3x-1 = 2x + 3$
$\Rightarrow x = 4$
If $\log_{(2x+3)}(3x-1) = -1$
$(2x + 3)(3x-1) = 1$
$\Rightarrow 6x^2 + 7x - 3 = 1$
$\Rightarrow 6x^2 + 7x - 4 = 0$

$$\Rightarrow x = \frac{-7 \pm \sqrt{49 + 96}}{12}$$

$$= \frac{-7 \pm \sqrt{145}}{12}$$

As $3x - 1 > 0$, $x > \frac{1}{3}$.

$\therefore$ Only $\frac{-7+\sqrt{145}}{12}$ satisfies.

$\therefore$ Two real values of x exist. Choice (C)

Q16. DIRECTIONS for question 16: Type in your answer in the input box provided below the question.
The graph of $y = x^2 + 4x + 7$ is symmetric with respect to the line $x = c$. What is the value of c?

$y = x^2 + 4x + 7 = (x + 2)^2 + 3$
The values of y at $x = -2 + k$ and $x = -2 - k$ are the same. ∴ The graph is symmetric with respect to $x = -2$
$c = -2$ Ans: (–2)

Q17. DIRECTIONS for questions 17 to 20: Select the correct alternative from the given choices.

$\lceil a \rceil$ is defined as the least integer greater than or equal to a. Let $P(a, b) = \lceil a \rceil + \lceil b \rceil + \lceil (a + b) \rceil$. Let $Q(a, b) = \lceil 2a \rceil + \lceil 2b \rceil$. Which of the following never holds true?

a) $P(a, b) \neq Q(a, b)$
b) $P(a, b) = Q(a, b)$
c) $P(a, b) < Q(a, b)$
d) $P(a, b) > Q(a, b)$

Let us choose values of a and b such that their decimal parts sum up to 1.
eg: $a = 6.4, b = 3.6$
$P(a, b) = \lceil 6.4 \rceil + \lceil 3.6 \rceil + \lceil 6.4 + 3.6 \rceil = 7 + 4 + 10 = 21.$
$Q(a, b) = \lceil 2(6.4) \rceil + \lceil 2(3.6) \rceil$
$= \lceil 12.8 \rceil + \lceil 7.2 \rceil = 13 + 8 = 21$
Hence P(a, b) can be equal to Q(a, b).
Suppose a and b have values such that their decimal part is less than 5.
$a = 3.2, b = 6.4$
$P(a, b) = \lceil 3.2 \rceil + \lceil 6.4 \rceil + \lceil 3.2 + 6.4 \rceil = 4 + 7 + 10 = 21$
$Q(a, b) = \lceil 2(3.2) \rceil + \lceil 2(6.4) \rceil = 7 + 13 = 20.$
Hence P(a, b) need not be equal to Q(a, b) and also can exceed Q(a, b). Hence by elimination, $P(a, b) < Q(a, b)$ never holds true. Choice (C)

Q18. DIRECTIONS for questions 17 to 20: Select the correct alternative from the given choices.
There are 21 people in a group. The difference between the age of the eldest person in the group and the average age of the group is 20 years. If any one person leaves the group, the average age of the remaining persons in the group will be a maximum of 21.5 years and a minimum of 20 years. Find the age of the youngest member of the group.

a) 11 years
b) 13 years
c) 7 years
d) 9 years

The average of the remaining persons will be the maximum and the minimum when the youngest and the eldest leave the group respectively.
Let the average age of the 21 people in the group be a years.
⇒ The average age of the 20 people when the eldest leaves the group $= \frac{21(a)-(a+20)}{20} = a - 1$ years.
⇒ The average age of 21 people = 20 + 1 = 21 years.
∴ The age of the youngest = (21) (21) – (20) (21.5)
= 441 – 430 = 11 years. Choice (A)

Q19. DIRECTIONS for questions 17 to 20: Select the correct alternative from the given choices.
In a stationery store, the prices of a book, a pen and a pencil are Rs.15, Rs.12 and Rs.8 respectively. Shiva had Rs.60 with him. If he spent all the money he had with him and bought a total of at least five items, comprising only books, pens and pencils, purchasing at least one item of each of the three, then in how many ways could he have purchased the items?

a) 3
b) 5
c) 4
d) None of the above

To buy one item of each kind, he spends 15 + 12 + 8
= 35 rupees.
With the remaining 25 rupees he has to buy at least 2 more items.
The possible sets are (8, 8), (8, 8, 8), (8, 12), (8, 15), (12, 12).
But in none of these ways will the amount spent be exactly ₹25 (i.e., the total money spent being equal to exactly ₹60.)
Hence, there is no possible way. Choice (D)

Q20. DIRECTIONS for questions 17 to 20: Select the correct alternative from the given choices.

What is the units digit of $3^{3\times3^{3\times3^{3\times3^{\cdot^{\cdot^{\cdot^{3\times3}}}}}}}$, where the total number of 3's is 333?

a) 3
b) 1
c) 7
d) 9

The last digit of the powers of 3 follow a cycle of 4 i.e., 3k and 3K + 4 have the same units digit.

∴ To find the units digit of the given number we need to find the remainder when the power is divided by 4.

$\text{Rem}\left[\frac{3^1}{4}\right] = 3$, $\text{Rem}\left[\frac{3^2}{4}\right] = 1$, $\text{Rem}\left[\frac{3^3}{4}\right] = 3$ and

$\text{Rem}\left[\frac{3^4}{4}\right] = 1$ i.e., $\text{Rem}\left[\frac{3^{odd}}{4}\right] = 3$ and $\text{Rem}\left[\frac{3^{even}}{4}\right] = 1$

The given power can be viewed as $3 \times 3^{odd} = 3^{odd + 1} = 3^{even}$.

∴ The remainder when the power is divided by four is 1.

∴ The last digit of the given number will have the same units digit of $3^1 = 3$.

Choice (A)

Q21. DIRECTIONS for questions 21 and 22: Type in your answer in the input box provided below the question.

A function f(x) is said to be strictly increasing if $f(x_1) > f(x_2)$ for $x_1 > x_2$. The number of strictly increasing functions that can be defined from set A with 4 positive integers to set B with 6 positive integers is

A function $f : A \rightarrow B$ is said to be strictly increasing, if for all $x_i, x_j \in A$, $x_i > x_j \Rightarrow f(x_i) > f(x_j)$

In the present case, from the 6 elements of B, we need to select 4 (to be associated with 4 elements of A) we can see that repetitions need not be considered.

∴ Required number of strictly increasing functions = ${}^6C_4$

$= \frac{6(5)}{2} = 15$

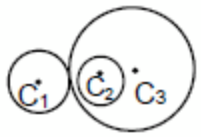
Ans: (15)

Q22. DIRECTIONS for questions 21 and 22: Type in your answer in the input box provided below the question.

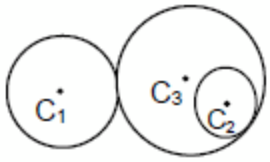
If C_i and C_j represent two circles, then $nCT(C_i, C_j)$ is defined as the number of common tangents that can be drawn to C_i and C_j. Given three circles C_1, C_2 and C_3, such that $nCT(C_1, C_2) = 4$ and $nCT(C_1, C_3) = 3$, how many of the following values can $nCT(C_2, C_3)$ assume?

(i) 0 (ii) 1 (iii) 2 (iv) 3 (v) 4

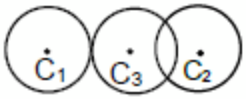
From given, we can conclude that C_1 and C_2 are non–over lapping circles while C_1 and C_3 are touching each other externally.

(i) 

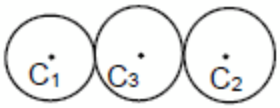
$\Rightarrow nCT(C_2, C_3) = 0$

(ii) 

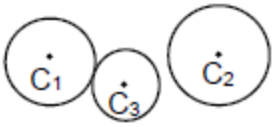
$\Rightarrow nCT(C_2, C_3) = 1$

(iii) 

$\Rightarrow nCT(C_2, C_3) = 2$

(iv) 

$\Rightarrow nCT(C_2, C_3) = 3$

(v) 

$\Rightarrow nCT(C_2, C_3) = 4$

$\therefore$ All cases are possible. Ans: (5)

Q23. DIRECTIONS for questions 23 to 25: Select the correct alternative from the given choices.

If $p \geq 2$, then which of the following inequalities definitely hold/s true?

a) $p^3 > 10^{p-1}$

b) $(p+1)^4 < 10^{p+1}$

c) $p > \left(1 + \frac{1}{p^{10}}\right)^{\frac{10}{p}}$

d) More than one of the above

(A). $p^3 > 10^{p-1}$
If $p = 3$, then the above inequality is false.
(B). $(p + 1)^4 < 10^{p+1}$
Let $p + 1 = q$ and $q \geq 3$
(B) $\Rightarrow q^4 < 10^q$
Applying log to the base 10 on both the sides, we get $4 \log_{10} q < q$.
If $q = 3$, then $4(0.2) < 3$; True
If $q = 10$, then $4(1) < 10$; True
If $q = 100$, then $4(2) < 100$; True
As we increase the value of q from 3, the value of $4 \log_{10} q$ will be much lesser than q.
$\therefore$ B is always true.

(C). $p > \left(1 + \frac{1}{p^{10}}\right)^{\frac{10}{p}}$

If $p = 2$, then $2 > \left(1 + \frac{1}{2^{10}}\right)^5$, which is true as $\frac{1}{2^{10}} < 0.001$.

As p increases, both $\frac{1}{p^{10}}$ as well as $\frac{10}{p}$ will decrease.

$\therefore p$ is always greater than $\left(1 + \frac{1}{p^{10}}\right)^{\frac{10}{p}}$ where $p \geq 2$.

$\therefore$ C is always true. Choice (D)

Q24. DIRECTIONS for questions 23 to 25: Select the correct alternative from the given choices.
A factory produces nuts and bolts. A machine in it produces only nuts while another produces only bolts. The machine producing only nuts produces 400 nuts per minute and needs to be cleaned for 15 minutes after production of 2000 nuts. The machine producing only bolts produces 300 bolts per minute and needs to be cleaned for 15 minutes after production of 3000 bolts. Find the minimum time (in minutes) required to produce 12000 pairs of bolts and nuts if both machines are operated simultaneously.

a) 85
b) 105
c) 100
d) 120

The nut machine makes 400 nuts per min and 2000 nuts in 5 min. Then, it has to be cleaned for 15 min.
∴ To produce 12,000 nuts, time required
= 5(20) + 5 = 105 min
The bolt machine makes 300 bolts per min and 3000 bolts in 10 min.
Then, it has to be cleaned for 15 min.
∴ To produce 12,000 bolts, time required = 3(25) + 10
= 85 min.
In both cases, we may ignore the time needed for cleaning, after the last lots are produced. We see that the time required is 105 min. Choice (B)

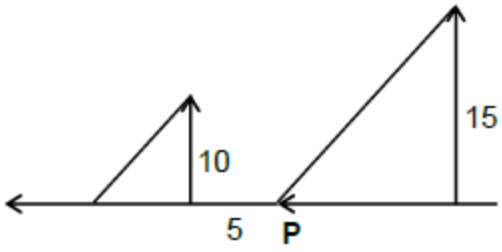
Q25. DIRECTIONS for questions 23 to 25: Select the correct alternative from the given choices.
Let $\{ b_i \}$, where i is a natural number, be a sequence of real numbers. If $b_{p+q} = b_p + b_q - pq$ and $b_8 = 100$, then what is the value of b_{15}?

a) 135
b) 130
c) 180
d) 225

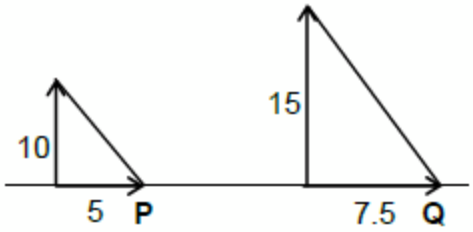
Given $b_8 = 100$
$\Rightarrow b_{16} = b_8 + b_8 - 64 = 136$
Now $b_8 = b_4 + b_4 - 16$
$\Rightarrow b_4 = 58$
Similarly $b_2 = 31$ and $b_1 = 16$
$\therefore b_{16} = b_1 + b_{15} - 15$
$\Rightarrow 136 = 16 + b_{15} - 15$
$\Rightarrow b_{15} = 135$ Choice (A)

Q26. DIRECTIONS for question 26: Type in your answer in the input box provided below the question.
A 15-foot high pole, AB, stands in an open field and directly to its west, stands a 10-foot high pole. At 10:00 a.m., the tip of the shadow of the first pole falls 5 feet to the east of the foot of the second pole. When the tip of the shadow of the second pole falls at the same point, the tip of the shadow of the first pole falls at Q. How far (in feet) is Q from the foot of the first pole?
Enter your answer as a decimal value, rounded off to two decimal places.

The two poles and their shadows at 10:00 a.m. are shown in the figure below.



The tip of the shadow of the 15-foot pole falls at P. When the tip of the shadow of the 10-foot pole falls at P, that of the 15-foot pole falls at Q, as shown in the figure below.



As the two triangles are similar, the required distance is 7.5 feet. Ans: (7.50)

Q27. DIRECTIONS for questions 27 and 28: Select the correct alternative from the given choices.
A cuboidal room with a square floor has a volume of 12500 cubic feet. Anil painted all the walls and the ceiling of the room at the rate of 1 square foot per minute. Find the difference in the time taken to paint the ceiling and the time taken to paint all the walls, if the perimeter of the floor is 100 feet.

a) 21 hours and 35 minutes
b) 20 hours and 25 minutes
c) 23 hours and 15 minutes
d) 22 hours and 55 minutes

Let the length, breadth and height be denoted by l, b and h respectively.
Base is a square.
$\therefore l = b$
$\therefore$ Base perimeter = 4l
$\therefore 4l = 100$
$l = 25$
$\therefore b = 25$
Volume = l.b.h = 12500
$\Rightarrow h = 20$
Area of the walls = 2(h)(l + b) = 2000 sq.ft
The area of the ceiling = Area of the base
$= l^2 = 625$ sq.ft
Rate of painting = 1 sq.ft/minute
$\therefore$ Required difference = (2000 − 625) minutes
= (1375) minutes = 22 hours and 55 minutes. Choice (D)

Q28. DIRECTIONS for questions 27 and 28: Select the correct alternative from the given choices.
There are three points – P, B and Q – on the ground, in a straight line, with a pole AB, at B, such that the pole AB is leaning away from P and towards Q. If B is 20 m away from both P and Q, and the angles of elevation of the top of the pole as observed from P and Q are 30° and 60° respectively, find the length of the pole.

a) 20 m
b) $10\sqrt{3}$ m
c) 10 m
d) Cannot be determined

In ΔPAQ, since $\angle P + \angle Q = 90°$
$\angle A = 90°$
$\Rightarrow$ The semicircle drawn with PQ as diameter will pass through A.
Also, B is the midpoint of PQ, since it is given that PB = BQ = 20 m.
$\therefore$ B is the centre of the semicircle.
$\Rightarrow$ BA = BP = BQ = 20 m. Choice (A)

Q29. DIRECTIONS for question 29: Type in your answer in the input box provided below the question.
A cuboid has a total surface area of A. It was cut into 120 identical cubes. If the total surface area of these cubes is KA, what is the least possible value of K?
Enter your answer as a decimal value, rounded off to three decimal places

The initial shape (ratio of length, breadth, height) of the cuboid has not been specified. But the total surface area has been taken as A. The cuboid it is cut into 120 identical cubes, each of side a (say). Therefore, the total surface area is 120 $(6a^2) = 720a^2$. The final area is this fixed quantity. The volume remains constant in the process.
It is given that $720a^2 = KA$. We need the minimum value of K. This would correspond to the maximum value of A. The total volume of the cuboid is $120a^3$. We need to distribute this fixed volume into a shape which produces the maximum A. (For the minimum A, we would have to pack the volume into a sphere, or as close to a sphere as possible, subject to the other constraints.)
For the maximum A, since we cannot cut the small cubes into smaller parts, arranging all of them in a line would produce a cuboid of dimensions a × a × 120a. The area of this cuboid A = 120a (4a) + $2a^2 = 428a^2$, which is the maximum possible.

The least value of K = $\frac{720a^2}{482a^2} = \frac{360}{241} = 1.494$ Ans: (1.494)

Q30. DIRECTIONS for questions 30 to 33: Select the correct alternative from the given choices.
If the a^{th}, b^{th}, c^{th} terms of a geometric progression are p, q, r respectively, then $p^{b-c} . q^{c-a} . r^{a-b}$ =

a) 0.
b) 1.
c) (a − b)(b − c)(c − a).
d) None of the above

Let the first term of the GP be x and the common ratio be y.
Given $p = x . y^{a-1}$
$q = x . y^{b-1}$
$r = x . y^{c-1}$
$\Rightarrow p^{b-c} . q^{c-a} . r^{a-b}$
$= [x^{b-c} . (y^{a-1})^{b-c}] [x^{c-a} . (y^{b-1})^{c-a}] [x^{a-b} . (y^{c-1})^{a-b}]$
$= x^{b-c+c-a+a-b} . y^{ab-ac-b+c+bc-ab-c+a+ac-bc-a+b}$
$= x^0 . y^0 = 1$

Alternative Solution:

Assuming a simple G.P. as 1, 1, 1 and 1, 2, 4, it can be observed from the choices that only choice (B) is possible. Choice (B)

Q31. DIRECTIONS for questions 30 to 33: Select the correct alternative from the given choices.

$\frac{1}{1!} \times \frac{2}{2!} \times \frac{3}{3!} \times \frac{4}{4!} \ldots\ldots \frac{n}{n!} =$

a) $\frac{1!+2!+3!\ldots\ldots+(n-1)!}{n!}$

b) $\frac{1}{2^{n-1}3^{n-2}4^{n-3}\ldots\ldots(n-1)^2}$

c) $\frac{1}{2^{n-2}3^{n-3}4^{n-4}\ldots\ldots(n-1)^1}$

d) $\frac{n}{n!(n-1)!}$

$\frac{1}{1!}\times\frac{2}{2!}\times\frac{3}{3!}\times\frac{4}{4!}\ldots\ldots\frac{n}{n!}$

$= 1 \times 1 \times \frac{1}{2!}\times\frac{1}{3!}\times\ldots\ldots\times\frac{1}{(n-1)!}$

$= \frac{1}{2!\times3!\times4!\ldots\ldots(n-1)!}$

$= \frac{1}{2^{n-2}3^{n-3}4^{n-4}\ldots\ldots(n-1)^1}$ Choice (C)

Q32. DIRECTIONS for questions 30 to 33: Select the correct alternative from the given choices.
A, B and C start simultaneously from P and go towards Q. A being the fastest, reaches Q, turns back without changing his speed and proceeds towards P. He meets B at a distance of 30 metres from Q and C at a distance of 70 metres from Q. B also reaches Q, turns back without changing his speed and proceeds towards P. He meets C on the way at a distance of d metres from Q. If PQ = 210 metres, find the value of d.

a) 42
b) 84
c) 126
d) 168

The data is tabulated below.

A	B	C
210 + 30	210 – 30	
210 + 70		210 – 70
	180	$140\left(\frac{240}{280}\right)=120$

In the time A covers (210 + 30) m, B covers (210 – 30) m
In the time A covers (210 + 70) m, C covers (210 – 70) m
$\therefore$ In the time B covers 180 m, C covers 120 m
We need to split PQ into 5 parts. C would cover 4 and B would cover 5 + 1.
$\therefore$ B meets C at $\frac{1}{5}(210)$ or 42 m from Q.

Alternative Solution:

It is easy to check from the choices that since A meets C at a distance of 70 m from Q, B who is slower than A, will meet C at a distance of less than 70 m from Q. Hence, only option (A) is possible. Choice (A)

Q33. DIRECTIONS for questions 30 to 33: Select the correct alternative from the given choices.
If for the quadratic equation $px^2 + qx + r = 0$, the sum of the squares of its roots is equal to the sum of the cubes of its roots and $q^3 + pq^2 = 2p + 3q \neq 0$, then what is the value of pr?

a) 0
b) 1
c) 2
d) Cannot be determined

Let α and β the roots of the equation $px^2 + qx + r = 0$

$\therefore \alpha + \beta = -q/p$ and $\alpha\beta = r/p$

Given $\alpha^2 + \beta^2 = \alpha^3 + \beta^3$

$\Rightarrow (\alpha + \beta)^2 - 2\alpha\beta = (\alpha + \beta)^3 - 3\alpha\beta\,(\alpha + \beta)$

$$\Rightarrow \left(\frac{-q}{p}\right)^2 - \frac{2r}{p} = \left(\frac{-q}{p}\right)^3 - 3 \times \frac{r}{p}\left(\frac{-q}{p}\right)$$

$$\Rightarrow \frac{q^2}{p^2} - \frac{2r}{p} = \frac{-q^3}{p^3} + \frac{3rq}{p^2}$$

$$\Rightarrow \frac{q^2 - 2pr}{p^2} = \frac{-q^3 + 3rqp}{p^3}$$

$\Rightarrow pq^2 - 2p^2r = -q^3 + 3pqr$

$\Rightarrow q^3 + q^2p = 2p^2r + 3pqr$

$\Rightarrow q^3 + q^2p = pr\,(2p + 3q)$, but given that

$q^3 + q^2\,p = (2p + 3q) \neq 0$

$\Rightarrow pr = 1$ Choice (B)

Q34. DIRECTIONS for question 34: Type in your answer in the input box provided below the question.

Six boxes are numbered 1, 2, 3, 4, 5 and 6. Each box must contain either a white ball or a black ball, but not both. At least one box must contain a black ball and boxes containing black balls must all be consecutively numbered. Find the total number of ways of filling the boxes.

If there is 1 black ball, it can be placed in 6 ways. If there are 2 black balls, they can be placed in 5 ways (in 1, 2; 2, 3; 3, 4; 4, 5 and 5, 6) and so on. If there are 6 black balls, they can be placed in 1 way.

$\therefore$ The total number of ways of placing the balls is $1 + 2 + \ldots + 6 = 21$. Ans: (21)