AIMCAT 2024
VARC

DIRECTIONS *for questions 1 to 4:* The passage given below is accompanied by a set of four questions. Choose the best answer to each question.

Four centuries after Galileo Galilei discovered that Jupiter had four moons, it remains impossible to understand the solar system without understanding Jupiter. The Jovian moon, Europa, is thought to have beneath its icy surface a liquid-water ocean that might conceivably support life. Jupiter's enormous magnetic field traps and accelerates high-energy particles (protons and electrons) thrown off by the sun. It has the fiercest radiation belts of any planet in the solar system, making it extremely hostile.

Man-made satellites have simply flown past Jupiter on their way elsewhere, taking a few photographs to send back home while they gathered energy from the Jovian gravitational field in a slingshot manoeuvre, to speed their journeys up. Only *Galileo* was an exception: it orbited Jupiter. Now, *Juno* [a probe of NASA] will be launched to help unravel Jupiter"s origin.

Jupiter is a “gas giant”. It was formed from the same primordial cloud of hydrogen and helium as gave birth to the sun. But how this happened is unclear. The “core accretion” theory holds that a rocky core formed first, assembling itself under the influence of gravity from dust grains, pebbles and boulders. Once the core acquired sufficient mass, it attracted hydrogen and helium from the

primordial cloud, having enough gravity to hold onto them. If this is correct, Jupiter could be a rocky planet similar to Earth. The core-accretion theory has a timing problem. Light exerts pressure, and the pressure of light from the infant sun should have driven off the hydrogen and helium before Jupiter had a chance to grab the primordial cloud.

A rival hypothesis argues that Jupiter formed without the need for a large rocky core, from a knot in the gas cloud itself. That would make it quite a different beast from an overblown terrestrial planet. One of *Juno*'s jobs, is to measure variations in Jupiter's gravitational field, to determine whether the planet has a core, and the core's size. This will not resolve the question of how Jupiter formed but it should narrow the range of possibilities.

Jupiter's atmosphere is another puzzle. Back in 1995, *Galileo* dropped a probe into that atmosphere, which reported comparatively greater amounts of heavy elements like nitrogen and argon, than are found in the sun. This suggests that Jupiter formed in the cool outer reaches of the early solar system, where such elements would have been more abundant, before migrating to its current position. But there was much less of one heavy element – oxygen – than expected. The probe detected little water, the compound into which gas-cloud oxygen is overwhelmingly bundled. ...

There are fears that something went amiss. So *Juno* will attempt the same experiment by sampling different parts of the atmosphere with each of its diving loops. Combining measurements from all over the planet should help sort the theoretical sheep from the goats.

Nor is it theories of Jupiter's formation alone that are at stake. The chance to poke a gas giant up close could help shed light on how planetary systems other than the sun's have formed. One of the big surprises of exoplanetology has been the discovery of a type of planet known as "Hot Jupiters" (gas giants which orbit close to their parental stars and have orbital periods measured in few days). Such worlds could not have formed in their present locations. The radiation from their parent stars would have disassembled them as fast as they formed.

Q1. Based on information provided in the passage, we can infer that, as compared to the sun, the Jovian atmosphere is reported to have greater proportions of

a) protons and electrons.

b) hydrogen and helium.

c) **nitrogen and argon.**

d) oxygen and dust grains.

Number of words and Explanatory notes for RC:

Number of words: 567

Option A: Jupiter's enormous magnetic field traps and accelerates high-energy particles (protons and electrons) thrown off by the sun. But choice A cannot be attributed to the Jovian atmosphere. So it is incorrect.
Option B: Jupiter is a "gas giant". It was formed from the same primordial cloud of hydrogen and helium as gave birth to the sun. Once the core acquired sufficient mass, it attracted hydrogen and helium from the primordial cloud, having enough gravity to hold onto them. But we cannot infer from the passage that hydrogen and helium are present in greater quantities in Jupiter's atmosphere when compared Jupiter's to the sun's. So choice B is wrong.
Option C: Back in 1995, *Galileo* dropped a probe into Jupiter's atmosphere, which reported comparatively greater amounts of heavy elements like nitrogen and argon, than are found in the sun. This makes choice C the correct answer.
Option D: The "core accretion" theory holds that a rocky core formed first, assembling itself under the influence of gravity from dust grains, pebbles and boulders. "dust grains" has not been mentioned as a point of difference between the Jovian atmosphere and the sun. But there was much less of one heavy element – oxygen – than expected. Choice D is not the answer for the question. Choice (C)

Q2. Based on the data that Juno collects, which of the following hypothesis related to Jupiter can be verified?

a) Jupiter may have come into being elsewhere and then migrated closer to the sun.

b) The same primordial cloud of hydrogen and helium formed both Jupiter and the sun.

c) **Comets and asteroids from the outer reaches of the early solar system supplied heavy elements to Jupiter's atmosphere.**

d) There was a systematic variation between the primeval atmospheric conditions of Jupiter and those of other planets of the extrasolar system.

Number of words and Explanatory notes for RC:

Number of words: 567

The passage outlines several hypotheses and evidences related to Jupiter's formation. *Juno*, a probe of NASA, will be launched to help unravel Jupiter's origin.
Option A: "Hot Jupiters" are gas giants which orbit close to their parental stars and have orbital periods measured in few days. Such worlds could not have formed in their present locations. The radiation from their parent stars would have disassembled them as fast as they formed. *Galileo* reported comparatively greater amounts of heavy elements like nitrogen and argon, than are found in the sun. This suggests that Jupiter formed in the cool outer reaches of the early solar system, where such elements would have been more abundant, before migrating to its current position. Hence the correct hypothesis is that which is provided in choice A.
Option B: Jupiter is a "gas giant". It was formed from the same primordial cloud of hydrogen and helium as gave birth to the sun. But how this happened is unclear. So choice B is already known. It is not a hypothesis that *Juno* will verify. Choice B is not the answer.
Option C: There are greater amounts of heavy elements like nitrogen and argon in Jupiter's atmosphere, than are found in the sun. This suggests that Jupiter formed in the cool outer reaches of the early solar system, where such elements would have been more abundant, before migrating to its current position. But choice C is out of scope of the given passage.
Option D: Though the passage indicates the importance of exoplanetology – a study of the planetary systems other than the sun's – it does not talks about the primeval atmospheric conditions of other planets of the extrasolar system. So "systematic variation between the primeval atmospheric conditions of Jupiter and those of other planets of the extrasolar system" cannot be arrived at. Choice D is not the hypothesis related to gas giants in the galaxies. Choice D is not the answer. Choice (A)

Q3. Which of the following studies will add the most depth to the author's objective mentioned in the passage?

a) A study that illustrates the similarity between Jupiter's four largest moons and the planets of the solar system.

b) An investigation that unifies all the findings related to the historical origin of Jupiter.

c) **A study resolving the question of when and where Jupiter and several Hot Jupiters were formed.**

d) Astronomical assessment of the merits and flaws of the "core accretion" theory and the rival hypothesis mentioned in the passage.

Number of words and Explanatory notes for RC:

Number of words: 567

Option A: Four centuries after Galileo Galilei discovered that Jupiter had four moons, it remains impossible to understand the solar system without understanding Jupiter. Though a mention is made of Jupiter's moon and man-made satellites approaching or orbiting Jupiter, choice A is not related to the question at all. It runs tangent to the overall objective of the author of the passage.
Option B: Four centuries after Galileo Galilei discovered that Jupiter had four moons, it remains impossible to understand the solar system without understanding Jupiter. Determining whether the planet has a core, and its size, will not resolve the question of how Jupiter was formed but it should narrow the range of possibilities. .... Nor is it theories of Jupiter's formation alone that are at stake. The chance to poke a gas giant up close could help shed light on how planetary systems other than the sun's have formed. The big surprise of exoplanetology has been the discovery of "Hot Jupiters". Exoplanetology, or exoplanetary science, is an integrated field of astronomical science dedicated to the search for and study of exoplanets (extrasolar planets). So choice B (findings related to the historical origin of Jupiter) would serve as the first step in furthering the author's objective and having understood the formation of Jupiter, the history of its cousins in other solar systems would be studied. Choice B is the correct answer.
Option C: The author makes it very clear right at the beginning of the passage that we need to understand the planet Jupiter's historical origin before we can begin to understand the solar system. We need to understand **how** Jupiter was formed. When and where Jupiter and several Hot Jupiters were formed is not the main objective of the passage. Choice C does not help to complete the author's objective. Choice C is incorrect.
Option D: The "core accretion" theory and the rival hypothesis have been mentioned in the passage, as part of the discussion of Jupiter's formation. Choice D may lead to a correct understanding as to whether Jupiter formed with or without a large rocky core, thereby suggesting whether Jupiter resembles the earth or not. Choice D can be considered a subset of choice B. Choice D deviates from the overarching goal of the passage. Choice (B)

Q4. In para 5, the finding that "the probe detected little water, the compound into which gas-cloud oxygen is overwhelmingly bundled" can be most undermined by which of the following?

a) A liquid-water ocean was observed on the surface of Jupiter's moon, Europa.

b) The probe survived for less than a day before contact with Jupiter was lost.

c) ***Galileo*** **sampled different parts of the Jovian atmosphere with each of its diving loops.**

d) **The probe dropped into a particularly dry part of the planet's atmosphere.**

Number of words and Explanatory notes for RC:

Number of words: 567

Galileo dropped a probe into that atmosphere, which reported comparatively greater amounts of heavy elements like nitrogen and argon .... But there was much less of one heavy element – oxygen – than expected. The probe *Galileo* detected little water, the compound into which gas-cloud oxygen is overwhelmingly bundled.

Option A: The Jovian moon, Europa, is thought to have beneath its icy surface a liquid-water ocean that might conceivably support life. If the probe detected a liquid-water ocean on the surface of Jupiter's moon, Europa, it need not be concluded that liquid-water should have been detected in Jupiter's atmosphere. We are comparing two different regions – atmosphere and ocean – in two different bodies – Jupiter and Europa. These need not have the same constituents. So choice A cannot be an argument that will weaken the quoted finding in the question.

Option B: The *Galileo* probe surviving for less than a day may be a limitation. Even so, some measurements could have been accurately taken and reported. Choice B is not specifically enough to undermine the quoted finding in the question.

Option C: If different parts of the Jovian atmosphere were already sampled, then the finding that "the probe detected little water, the compound into which gas-cloud oxygen is overwhelmingly bundled" would be strengthened. The passage goes on to say "there are fears that something went amiss. So *Juno* will attempt the same experiment by sampling different parts of the atmosphere with each of its diving loops". Hence choice C cannot be the answer.

Option D: If the *Galileo* probe dropped into a particularly dry part of the planet's atmosphere, then the finding "there is little water, the compound into which gas-cloud oxygen is overwhelmingly bundled in the Jovian atmosphere" would be incorrect. The atmosphere would have water in other locations. Hence choice D will most weaken the evidence and is the answer. Choice (D)

DIRECTIONS *for questions 5 to 9:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

What vehicle is most strongly associated with Republican voting districts? Extended-cab pickup trucks. For Democratic districts? Sedans. Those conclusions may not be particularly surprising. After all, market researchers and political analysts have studied such things for decades. But what is surprising is how researchers working on an ambitious project [based at Stanford University] reached those conclusions: by analysing 50 million images and location data from Google Street View, the street-scene feature of the online giant's mapping service.

For the first time, helped by recent advances in artificial intelligence, researchers are able to analyse large quantities of images, pulling out data that can be sorted and mined to predict things like

income, political leanings and buying habits. In the Stanford study, computers collected details about cars in the millions of images it processed, including makes and models.

All of a sudden, we can do the same kind of analysis on images that we have been able to do on text…For computers, as for humans, reading and observation are two distinct ways to understand the world. In that sense, computers don't have one hand tied behind their backs anymore.

Text has been easier for A.I. [artificial intelligence] to handle, because words have discrete characters – 26 letters, in the case of English. That makes it much closer to the natural language of computers than the freehand chaos of imagery. But image recognition technology, much of it developed by major technology companies, has improved greatly in recent years.

The Stanford project gives a glimpse at the potential...But first, a database curated by humans had to train the A.I. software to understand the images. The researchers recruited hundreds of people to pick out and classify cars in a sample of millions of pictures. Some of the online contractors did simple tasks like identifying the cars in images. Others were car experts who knew nuances like the subtle difference in the taillights on the 2007 and 2008 Honda Accords.

"Collecting and labelling a large data set is the most painful thing you can do in our field," said Ms. Timnit Gebru, who received her Ph.D. from Stanford and works for Microsoft Research. "But without experiencing that data-wrangling work you don't understand what is impeding progress in A.I. in the real world." [she added]

Once the car-image engine was built, its speed and predictive accuracy was impressive. It successfully classified the cars in the 50 million images in two weeks. That task would take a human expert, spending 10 seconds per image, more than 15 years.

Identifying so many car images in such detail was a technical feat. But it was linking that new data set to public collections of socioeconomic and environmental information, and then tweaking the software to spot patterns and correlations, that makes the Stanford project part of what computer scientists see as the broader application of image data…

The significance of the project, experts say, is a proof of concept – that new information can be gleaned from visual data with artificial intelligence software and plenty of human help. The role of

such research will be mainly to supplement traditional information sources [like the household surveys conducted by the Census Bureau]…

…Image-based studies could be a big help now that public response rates to sample surveys are declining. An A.I.-assisted visual census could fill in gaps in the current data, but also provide more timely insights than the traditional census, conducted every 10 years…

Q5. The broader application of image data referred to in the passage is to:

a) replace traditional surveys and reports.

b) make various inferences and predictions about the general public life.

c) **find a correlation between socioeconomic and environmental data sets.**

d) **measure public response rates during census surveys.**

Number of words and Explanatory notes for RC:

Number of words: 570

Option A: The image data analysis can assist or add insights to the existing framework. There isn't enough data to suggest that this analysis will completely replace surveys and reports used traditionally.
Option B: Consider the sentence: 'For the first time, helped by recent advances in artificial intelligence, researchers are able to analyse large quantities of images, pulling out data that can be sorted and mined ***to predict things like income, political leanings and buying habits***.' From the underlined portion, we can understand that the broader application is to understand/infer patterns about the general public. Hence, Option B is the answer.
Option C: From 'But it was linking that new data set to public collections of socioeconomic and environmental information', we can understand that new data could be linked to ***socioeconomic and environmental information***. The underlined portion here is considered as one category and not two discrete sets of information which need to be clubbed or correlated. Hence, Option C is not the answer.
Option D: The visual data analysis is a good thing because the response rates of public are going down during surveys. The author didn't intend to suggest that image data could be used to measure public response rates. Hence, Option D is not the answer.

Choice (B)

Q6. According to Ms. Gebru, progress in A.I. in the real world is impeded because:

a) there is lack of awareness about how important data-wrangling work is.

b) collecting and labelling a large data set is extremely painful.

c) **curated data sets to train the A.I. software are not available.**

d) **there isn't much experience available when it comes to data analysis.**

Number of words and Explanatory notes for RC:

Number of words: 570

Consider the sentences: "Collecting and labelling a large data set is ***the most painful thing you can do in our field***," said Ms. Timnit Gebru, who received her Ph.D. from Stanford and works for Microsoft Research. "But without experiencing that data-wrangling work you don't understand what is impeding progress in A.I. in the real world."
Option A: The data-wrangling work, according to Ms. Gebru, is for understanding 'what is impeding progress'. So, whatever that is definitely not the data-wrangling work itself. Hence, Option A is not the answer.
Option B: This is already understood from the project itself. According to Gebru, the process of collecting and labelling a large data is extremely painful. That is already known. But, why exactly is it painful? That is the impediment that is hindering progress in the AI world. Hence, Option B is not the answer.
Option C: The reason that collecting the data set was such a massive process is because the visual-analysis part is missing in AI, something that can change now, thanks to this project. Hence, Option C gives us the reason why the progress has been hindered in the AI world and that reason is that the amount of data, required to train the AI so it can perform image analysis, was missing.
Option D: Given experts were involved in the project, experience in data analysis is not a concern. It is alien concept in this discussion. Hence, Option D is the easiest of the options to eliminate. Choice (C)

Q7. Text is easier than images for A.I. to handle because?

a) **Words are permutations of fixed set of letters, whereas images are harder to decipher accurately.**

b) There are only 26 letters but more number of images.

c) **The database capacity to parse imagery is not feasible.**

d) **Imagery isn't close enough to the natural language of humans.**

Number of words and Explanatory notes for RC:

Number of words: 570

Text has been easier for A.I. [artificial intelligence] to handle, ***because words have discrete characters*** – 26 letters, in the case of English. That makes it ***much closer to the natural language of computers than the freehand chaos of imagery***. But image recognition technology, much of it developed by major technology companies, has improved greatly in recent years. As mentioned, the reason is that imagery is chaotic to decipher, whereas letters are set in number and discrete and hence, easier to analyse.

Option A: While the number of letters is fixed, and any word is made from those discrete characters, there is a pattern in case of text. The same is not true for images which are drawn freehand and hence, are a lot more chaotic. That also makes it less systematic to decipher. Hence, Option A is the answer.

Option B: The number/quantity is not the concern here. The concern is in difficulty of analysis. Hence, Option B is not the answer.

Option C: The passage doesn't discuss logistics, infrastructure or database capacities at any point of time. Hence, Option C is easy to eliminate.

Option D: The natural language of machines and similarity with that is important. The natural language of humans hasn't been brought into discussion in the abovementioned para. Hence, Option D is not the answer. Choice (A)

Q8. Why did computers have one hand tied behind their back until now, according to the author?

a) **Computers were able to read but not observe.**

b) Computers couldn't analyse images as if they were letters.

c) **Computers weren't used for processing imagery.**

d) **Computers cannot read and observe at the same time.**

Number of words and Explanatory notes for RC:

Number of words: 570

Consider the sentences: All of a sudden, ***we can do the same kind of analysis on images that we have been able to do on text***...For computers, as for humans, reading and observation are two distinct ways to understand the world. In that sense computers don't have one hand tied behind their backs anymore.
This is called an analogy. Just as we are probably not as productive with one hand tied behind our back, similarly computers weren't as productive without the ability to analyse images, the way they analysed texts.
Option A: If they could read and observe, then they wouldn't have one of their hands tied behind their back. It is the absence of one of those features (observing) that makes them less productive. Hence, Option A is the answer.
Option B: Computers can analyse letters but cannot analyse images. This is indeed true. This is why they have one hand tied. However, Option B explains the analogy differently. The method of analysing letters need not be the same as that of images. Hence, Option B is not the answer.
Option C: Computers not being used is not a reflection of the inability of systems to analyse visual data. They could not be used until this project as they didn't have the ability to process images. Hence, Option C is not the answer.
Option D: This indicates that they can read and observe separately, but not together. However, that is not true until this project (they cannot observe, just read). Hence, Option D is not the answer. Choice (A)

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Q9-12 The passage given below is accompanied by a set of five questions.

What vehicle is most strongly associated with Republican voting districts? Extended-cab pickup trucks. For Democratic districts? Sedans. Those conclusions may not be particularly surprising. After all, market researchers and political analysts have studied such things for decades. But what is surprising is how researchers working on an ambitious project [based at Stanford University] reached those conclusions: by analysing 50 million images and location data from Google Street View, the street-scene feature of the online giant's mapping service.

For the first time, helped by recent advances in artificial intelligence, researchers are able to analyse large quantities of images, pulling out data that can be sorted and mined to predict things like income, political leanings and buying habits. In the Stanford study, computers collected details about cars in the millions of images it processed, including makes and models.

All of a sudden, we can do the same kind of analysis on images that we have been able to do on text…For computers, as for humans, reading and observation are two distinct ways to understand the world. In that sense, computers don't have one hand tied behind their backs anymore.

Text has been easier for A.I. [artificial intelligence] to handle, because words have discrete characters – 26 letters, in the case of English. That makes it much closer to the natural language of computers than the freehand chaos of imagery. But image recognition technology, much of it developed by major technology companies, has improved greatly in recent years.

The Stanford project gives a glimpse at the potential...But first, a database curated by humans had to train the A.I. software to understand the images. The researchers recruited hundreds of people to pick out and classify cars in a sample of millions of pictures. Some of the online contractors did simple tasks like identifying the cars in images. Others were car experts who knew nuances like the subtle difference in the taillights on the 2007 and 2008 Honda Accords.

"Collecting and labelling a large data set is the most painful thing you can do in our field," said Ms. Timnit Gebru, who received her Ph.D. from Stanford and works for Microsoft Research. "But without experiencing that data-wrangling work you don't understand what is impeding progress in A.I. in the real world." [she added]

Once the car-image engine was built, its speed and predictive accuracy was impressive. It successfully classified the cars in the 50 million images in two weeks. That task would take a human expert, spending 10 seconds per image, more than 15 years.

Identifying so many car images in such detail was a technical feat. But it was linking that new data set to public collections of socioeconomic and environmental information, and then tweaking the software to spot patterns and correlations, that makes the Stanford project part of what computer scientists see as the broader application of image data…

The significance of the project, experts say, is a proof of concept – that new information can be gleaned from visual data with artificial intelligence software and plenty of human help. The role of such research will be mainly to supplement traditional information sources [like the household surveys conducted by the Census Bureau]…

…Image-based studies could be a big help now that public response rates to sample surveys are declining. An A.I.-assisted visual census could fill in gaps in the current data, but also provide more timely insights than the traditional census, conducted every 10 years…

Q9. The 'proof of concept' mentioned in the penultimate para is that:

a) **Images can be analysed in large numbers.**

b) It is possible to glean through images without human help.

c) **It is possible to analyse visual data.**

d) **Imagery is far more complicated than text to analyse.**

Number of words and Explanatory notes for RC:

Number of words: 570

Consider the sentences: The significance of the project, experts say, is ***a proof of concept*** — ***that new information can be gleaned from visual data*** with artificial intelligence software and plenty of human help. The role of such research will be mainly to supplement…
The underlined portions explain what the proof of concept is – that visual data/images can be parsed and analysed with artificial intelligence.
Option A: It was not about ***HOW*** many images can be analysed. It is about whether or not they could be analysed. That visual data could be processed – that was the concept. Hence, Option A is not the answer.
Option B: The above-mentioned para clearly states that a lot of human help was indeed required. Hence, Option B is not the answer.
Option C: This is the proof of concept that can change the way AI works and processes information. The whole project was about analysing visual data, to assist in research and surveys. Hence, Option C is the answer.
Option D: While this may be true, this was already known. The aim of the project was not to establish this. It was to analyse images despite this complexity. Hence, Option D is not the answer. Choice (C)

Q10. The author's suggestion, that overall productivity rises as resources move from the least to the most productive firms, can be weakened if:

a) **productivity of companies doesn't hit a plateau if resources are available.**

b) productivity of companies depends on the rules and regulations in markets.

c) **productivity of companies is a good indicator of longevity.**

d) **productivity of companies positively influences a nation's growth.**

Number of words and Explanatory notes for RC:

Number of words: 571

Consider the sentences: More recently, economists have emphasized how trade affects productivity. When a nation opens up to international trade, ***the most productive firms expand their markets***, while the least productive are forced out by increased competition. ***As resources move from the least to the most productive firms***, overall productivity rises. The author arrives at the conclusion only by ***assuming*** that ***productivity is directly proportional to resources***, and as resources are available, productivity increases.

Option A: If the productivity doesn't hit a plateau, then it will prove the author's statement. As the resources go up, the productivity goes up as well. Hence, Option A is not the answer.

Option B: In the above discussion, the productivity of companies is being impeded by a factor other than the resources. This means that even if resources are available, it is quite possible that the productivity doesn't go up because of the regulations/restrictions. This weakens the author's conclusion that as the resources move to productive firms, overall productivity rises. Hence, Option B is the answer.

Option C: If productivity of companies is an indicator of longevity, it tells us productive companies last longer. It doesn't tell us if their productivity can keep increasing without limitations. So, this is irrelevant. Hence, Option C is not the answer.

Option D: This option talks about the consequences of productivity, but doesn't touch upon the effect of resources or an external factor on productivity. So, this choice is irrelevant as far as the author's conclusion is concerned. Hence, Option D is not the answer.

Choice (B)

Q11. The author concludes that the theories of Smith and Ricardo should be taken seriously because free trade:

a) **leads to better economic growth.**

b) leads to increased ratio of trade to GDP.

c) **leads to better living standards.**

d) **leads to increased earning capability.**

Number of words and Explanatory notes for RC:

Number of words: 571

Consider the sentences: After analysing the data, Mr. Frankel and Mr. Romer concluded that "a rise of one percentage point in the ratio of trade to growth rate (GDP) ***increases income per person*** by at least one-half percent." In other words, nations should take the theories of Smith and Ricardo seriously.
From this, we can understand that the author thinks trade leads to better income per person (and that is a positive). The theories of Ricardo and Smith suggest that free trade is beneficial and leads to growth.
Option A: Consider the sentence: 'Throughout history, when nations have opened themselves up to the world economy, the typical result has been an increase in their growth rates.' From this, it can be clearly understood that trade impacts growth positively. Hence, Option A is the answer.
Option B: While the trade to GDP ratio has been discussed to talk about its impact on income level, the option talks about ***increased ratio of trade to GDP***. We cannot really understand how the ratio increasing or decreasing along with free trade can be inferred. Hence, Option B is not the answer.
Option C: While income levels might increase, the living standards need not increase because that depends on several other factors not discussed in the passage. Hence, Option C is not the answer.
Option D: Even if income levels go up with free trade, 'earning capability' remains an alien parameter not quite discussed in the passage. Hence, Option D is not the answer. Choice (A)

Q12. The problem addressed by Frankel and Romer's approach is that:

a) **some countries are landlocked and hence, cannot indulge in free trade.**

b) the increase in growth rates due to free trade are affected by government policies.

c) **not all closed economies remove trade restrictions and measure growth rates.**

d) **the effect of trade on growth is unclear because of policies and restrictions.**

Number of words and Explanatory notes for RC:

Number of words: 571

Consider the sentences: These results, while suggestive, ***come with a caveat***. Trade restrictions often accompany other government policies that interfere with markets. ***Perhaps these other policies, rather than trade restrictions, impede growth***. ***To address this problem***, a third approach to measuring the effects of trade, proposed by the economists Jeffrey A. Frankel of Harvard and David C. Romer [University of California], focuses on geography. Some countries trade less because of geographic disadvantages.

The problem can be understood as: the exact effect of trade is not known since policies and restrictions sometimes have an adverse effect on growth despite trade helping in growth.

Option A: Being landlocked is not a problem. Using such countries to calculate effect of trade on growth is the solution to the problem. Hence, Option A is not the answer.

Option B: This talks about the ***the increase in growth rate***, which is something we are not concerned about. We are concerned about the impediment of government policies, and how that has to be separated to understand the actual effect of trade on growth rate. Hence, Option B is not the answer.

Option C: This option misrepresents data in several ways. To start with, the very idea of a closed economy is one with restrictions on trade. So, removing restrictions to measure growth rate, absolutely makes no sense. Hence, Option C is not the answer.

Option D: This talks about the actual problem, for which the author suggests several approaches. It is to clearly understand how trade bumps up growth and also, how that can be calculated despite the confusing parameter of government policies. Hence, Option D is the answer. Choice (D)

DIRECTIONS *for questions 13 to 16:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

The place to start is 18th-century Scotland. Adam Smith's book … is often credited as the beginning of economics. The case for free trade is one of its major themes.

Smith argued that trade among nations is like trade among people. No one feels compelled to sew his own clothes and grow his own food simply to keep busy. Instead, we find employment doing what we do best and rely on other people for most goods and services. Similarly, nations should specialize in producing what they do best and freely trade with other nations to satisfy their consumption needs.

This argument was expanded by David Ricardo in the 19th century. Ricardo addressed the question: What if one nation does everything better than another? His answer was that trade depends on comparative advantage – how good a nation is at producing one thing relative to how good it is at producing another.

For example, even if Portugal was better than England at producing both wine and cloth, if Portugal had a larger advantage in wine production, Portugal should export wine and import cloth. Both nations would end up better off.

The same principle applies to people. Given his athletic prowess, Roger Federer may be able to mow his lawn faster than anyone else. But the advantage he has playing tennis is far greater. So, according to Ricardo, Mr. Federer should hire a lawn service and spend more time on the court.

More recently, economists have emphasized how trade affects productivity. When a nation opens up to international trade, the most productive firms expand their markets, while the least productive are forced out by increased competition. As resources move from the least to the most productive firms, overall productivity rises.

A sceptic might say that all this is just theory. Where's the evidence? One approach to answering this question is to examine whether countries that are open to trade enjoy greater prosperity. In a 1995 paper, the economists Jeffrey D. Sachs and Andrew Warner studied a large sample of nations and found that open economies grew significantly faster than closed ones.

A second approach is to look at what happens when closed economies remove their trade restrictions. Again, free trade fares well. Throughout history, when nations have opened themselves up to the world economy, the typical result has been an increase in their growth rates.

These results, while suggestive, come with a caveat. Trade restrictions often accompany other government policies that interfere with markets. Perhaps these other policies, rather than trade restrictions, impede growth.

To address this problem, a third approach to measuring the effects of trade, proposed by the economists Jeffrey A. Frankel of Harvard and David C. Romer [University of California], focuses on geography. Some countries trade less because of geographic disadvantages.

For example, New Zealand is disadvantaged compared with Belgium because it is farther from other populous countries. Similarly, landlocked nations are disadvantaged compared with nations with their own seaports. Because these geographic characteristics are correlated with trade, but arguably uncorrelated with other determinants of prosperity, they can be used to separate the impact of trade on national income from other confounding factors.

After analyzing the data, Mr. Frankel and Mr. Romer concluded that “a rise of one percentage point in the ratio of trade to growth rate (GDP) increases income per person by at least one-half percent.” In other words, nations should take the theories of Smith and Ricardo seriously.

Q13. The analogy of Roger Federer has been given by the author to show that:

a) **not everyone can reach excellence in everything.**

b) some people are good at everything.

c) **one should do the activity in which one has the most comparative advantage.**

d) **one should excel only at one activity.**

Number of words and Explanatory notes for RC:

Number of words: 571

Roger Federer is used as an example of someone who could do two things well. However, it doesn't mean he should do both. He should do what he is better at than others are (playing tennis) so that someone else can do the other bit (mowing lawn) in this case.
Option A: The author's argument is not about reaching excellence. It is about different people doing different things and then trading. Hence, Option A is not the answer.
Option B: Roger Federer was not mentioned as an example of someone who could do everything. That's why just two activities were mentioned. Hence, Option B is not the answer.
Option C: This is the author's main argument. Federer may be good at mowing lawns and playing tennis. But, he should stick to playing tennis as his resources are better utilised for that, and others cannot play tennis as well as he does, while someone else may be able to mow the lawn, despite not being as good as Federer at mowing lawns. Comparing Portugal and England, the author suggests that "even if Portugal was better than England at producing both wine and cloth, if Portugal had a larger advantage in wine production, Portugal should export wine and import cloth". Pursuing the activity in which one has the most comparative advantage is optimal. Hence, Option C is the answer.
Option D: There is no way we could restrict what one can excel at – one or several things. The author is talking about how we should restrict the number of activities one should apply their resources to, excel or not. Hence, Option D is not the answer.

Choice (C)

Q14. All of the following, if true, prove the efficacy of free trade EXCEPT:

a) **Free trade pushes resources towards the more productive firms.**

b) Economies with no trade restrictions grow faster than the ones that have restrictions.

c) **Closed economies grow faster as soon as trade restrictions are lifted.**

d) **Growth in geographically remote nations is stunted.**

Number of words and Explanatory notes for RC:

Number of words: 571

We can pick the right answer based on tone. Three of the four options would indicate that free trade leads to something positive.
Option A: According to the passage, free trade pushes resources towards the more productive firms and that results in overall growth. Hence, Option A is not the answer.
Option B: The author has used this piece of information to prove how open economies have better growth rates than closed economies. So, free trade does have positive consequences. Hence, Option B is not the answer.
Option C: Raising restrictions has resulted in good growth proving that it is free trade that has brought about a positive change. Hence, Option C is not the answer.
Option D: Growth being stunted in geographically remote areas (the remoteness affects free trade) is a parameter the author says can be used to measure the positive effects of free trade on growth (elsewhere where location is not a handicap).

Choice (D)

Q15. Which of the following is in sync with the idea conveyed by Blueprint?

a) **Most traits are polygenic.**

b) There are specific genes for complex, omni-genetic traits.

c) **The cost and timescale of decoding genomes is not feasible for collecting large amounts of genomic data.**

d) **Eugenics can provide solutions to intellectual disabilities.**

Number of words and Explanatory notes for RC:

Number of words: 588

Consider the sentences: Blueprint conveys that ***traits such as intelligence or mental health***—vulnerability to schizophrenia or autism, say—***are not determined by a few genes, but influenced by tens, hundreds or even thousands of them***. In general, the relationships are neither linear nor confined to single traits; so neat divisions between populations seem implausible, and any simple winnowing of "bad" mutations impossible. Also consider the sentence: Plomin shows persuasively that the genes we inherit affect, sometimes profoundly, our personality, temperament, physical and mental health and, thereby, our life outcomes.

So, there are two parts to what Plomin(and therefore, the book Blueprint) conveys – a. Genes are responsible for traits. b. We cannot really say that one trait comes from one specific gene. Several genes could be responsible for certain traits, thereby, ruling out the 'eugenics' idea of preferring or leaning towards those who are 'considered' to be carrying good genes.

Option A: The book conveys that traits are influenced by multiple genes. So, genes are influential and yet, not in the way they were understood to be until the latest research. The author would agree with the fact that most traits are 'polygenic' (they are caused as a combination of multiple genes, and not just one gene influencing it). Hence, Option A is the answer.

Option B: From 'omni-genetic traits (including height), affected by more or less the whole genome made up of some 23,000 genes' we can understand that omni-genetic traits are influenced by the entire genome, which is a combination of several genes. So, the choice is factually incorrect. Hence, Option B is not the answer.

Option C: Consider the sentence: 'but he has also seen it transformed by the sudden availability of genomic data from large numbers of individuals'. The given option is in direct disagreement with the statement because it says, the genomic data cannot be extracted easily. Hence, Option C is not the answer.

Option D: From 'modern behavioural genetics shows ***why "eugenic" solutions to intellectual disability*** (or assertions of "innate" racial differences that justify hierarchies or stereotypes) ***are flawed*** from a scientific point of view' we can understand that the idea that eugenics can provide solutions ***for intellectual disabilities***, is in itself flawed. Hence, Option D is not the answer. Choice (A)

Q16. The discovery that most traits are influenced by several genes was 'shocking' because:

a) **genes that have near-negligible effects cannot influence entire traits.**

b) the media had spun tales against such a possibility.

c) **experts believed that there are specific genes for specific traits.**

d) **all-or-nothing defects are caused by genes at the extremes of the spectrum.**

Number of words and Explanatory notes for RC:

Number of words: 588

Consider the sentences: Plomin says the discovery that most traits are "polygenic" —influenced by many genes that have individually near-negligible effects—was "shocking" to those in the field. This is an inadvertent admission that ***the "genes for" trope*** now so lamented by experts ***was created*** not by the media but ***by scientists who spun them this tale.*** It was shocking to the experts in the field. Also, it was shocking because the false belief was spun not by media but by experts.
Option A: The discussion here is about how genes that have near-negligible traits individually, influence traits together as a combination. The choice states the exact opposite of that by stating that genes cannot influence entire traits.
Option B: It is not the media that had spun the tales according to the lines underscored above. Hence, Option B is not the answer.
Option C: It was shocking because the false belief was spun by none other than experts. It is also shocking because 'the genes for' specific defects theory is now a trope, a mistaken cliched view, that is lamented and criticised by experts themselves. Hence, Option C is the answer.
Option D: The defects are not all-or-nothing. The theory that only one gene causes a defect is 'all-or-nothing'. So this choice distorts the data. Hence, Option D is not the right answer. Choice (C)

DIRECTIONS *for questions 17 to 20:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

What exactly do genes imply about our behaviour and abilities? [Robert] Plomin shows persuasively that the genes we inherit affect, sometimes profoundly, our personality, temperament, physical and mental health and, thereby, our life outcomes. Although Plomin tries to dispel accusations of biological determinism by repeating the slogan of today's geneticists that "genes are not destiny," I suspect many readers of Blueprint [Plomin's book] will be left wondering why not.

Plomin [an American psychologist] has long been at the forefront of efforts to understand our genes. He has seen his research [being] denounced as irresponsible and even quasi-fascistic – not to mention scientifically mistaken. He has seen the field suffer from false claims and a lack of hard

evidence; but he has also seen it transformed by the sudden availability of genomic data from large numbers of individuals. This data glut is due to the dramatic drop in the cost and timescale of decoding genomes in the wake of the Human Genome Project.

…Plomin believes that naysayers should now accept that genes influence not only our health, height, appearance and hair colour but pretty much every behavioural trait we can measure.

While some of the statistical tools and their interpretation remain under discussion, he is broadly right to say that behavioural genetics has established that link. To deny these facts leaves the door open to abuse by those with dangerous political agendas, as well as to overlook a biomedical resource of immense potential for health, social policy and our understanding of human nature.

Modern behavioural genetics shows why “eugenic” solutions to intellectual disability or assertions of “innate” racial differences that justify hierarchies or stereotypes are flawed from a scientific point of view, as well as an ethical one. Blueprint conveys that traits such as intelligence or mental health – vulnerability to schizophrenia or autism, say – are not determined by a few genes, but influenced by tens, hundreds or even thousands of them. In general, the relationships are neither linear nor confined to single traits; so neat divisions between populations seem implausible, and any simple winnowing of “bad” mutations impossible.

Thus, the popular notion that there are “genes for” some complex trait such as height or sexual orientation is plain wrong. Some researchers are now even talking about “omni-genetic” traits (including height), affected by more or less the whole genome made up of some 23,000 genes. In one especially valuable discussion, Plomin shows that many common mental illnesses and disabilities are not all-or-nothing “defects” but extremes on a spectrum that includes us all.

Plomin says the discovery that most traits are “polygenic” – influenced by many genes that have individually near-negligible effects – was “shocking” to those in the field. This is an inadvertent admission that the “genes for” trope now so lamented by experts was created not by the media but by scientists who spun them this tale…

Many genes, which operate at a very basic level in governing the biochemistry and growth of our cells and tissues, are multitaskers. The time it took for scientists to shift their views shows how even empirical disciplines can develop collective myopia.

Today's evidence shows that almost any human propensity is influenced by (many) genes, although the process is more complicated than most media reports acknowledge. Plomin recounts his involvement in a study in the 1980s reporting significant correlations between how much children watched television and their genes (as assessed by adoptive and non-adoptive siblings). How could such a genetic trait have possibly emerged from natural selection over just the few generations with access to television?

Q17. Which of the following questions, if answered, can help verify the author's conclusion as can be inferred from the last line of the passage?

a) **Are there correlations between how much children watched television and their genes?**

b) Are adoptive and non-adoptive siblings not similar?

c) **Do genetic traits emerge from natural selection?**

d) **Are the effects of natural selection not seen in the span of a couple of generations?**

Number of words and Explanatory notes for RC:

Number of words: 588

Consider the para: Today's evidence shows that almost ***any human propensity is influenced by (many) genes***, although the process is more complicated than most media reports acknowledge. Plomin recounts his involvement in a study in the 1980s reporting ***significant correlations between how much children watched television and their genes*** (as assessed by adoptive and non-adoptive siblings). ***How could such a genetic trait have possibly emerged from natural selection over just the few generations with access to television?***

The author uses Plomin's explanation to show that there is a definite correlation between genes and trait. He concludes that it is genes and not natural selection that influences certain traits (in this case TV-watching habits which definitely have developed over a period of time too small for natural selection to do its work). Also, please note that the author's question in the last sentence of the passage is a rhetorical one, with a foregone conclusion.

Option A: This has already been done and the results stated above. Therefore, this question will not be helpful in verifying the author's conclusion. Option A is not the answer.

Option B: The discussion is more about the influence of genes and a conclusion on adoptive and non-adoptive siblings wouldn't really help in anyway. It is irrelevant information. Option B is not the answer.

Option C: Whether the question gets a positive or negative answer, it doesn't really help in this case, because the author's conclusion is based on the time-span – a few generations. A study that proves genetic traits emerge from natural selection might still not weaken the author's conclusion because such traits may take centuries to manifest. Hence, Option C is not the answer.

Option D: Plomin's assumption in the last line of the passage is that genetic traits cannot possibly emerge within a few generations. It takes much longer. So, if the question is answered it can help be decisive about whether Plomin's assumption is valid or not. Hence, Option D is the answer. Choice (D)

Q18. The flaw from 'a scientific point of view' referred to in the fifth para (As far as…'bad' mutations impossible.) is that:

a) **assertions of innate racial differences cannot justify hierarchies and stereotypes.**

b) traits such as intelligence are determined by a large number of genes.

c) **it is possible to weed out bad mutations to achieve better mental health.**

d) **it leaves the door open to abuse by those with dangerous political agenda.**

Text Solution

Number of words and Explanatory notes for RC:

Number of words: 588

Consider the sentences: As far as political sensitivities go, modern behavioural genetics shows why "eugenic" solutions to intellectual disability or assertions of "innate" racial differences ***that justify hierarchies or stereotypes are flawed*** from a scientific point of view, as well as an ethical one. Blueprint conveys that ***traits such as intelligence or mental health***—vulnerability to schizophrenia or autism, say—***are not determined by a few genes***, but influenced by tens, hundreds or even thousands of them. The flaw is that eugenics assumes traits are influenced by a few specific genes. However, research has showed that some traits are influenced by tens of thousands of genes.

Option A: Innate racial differences are used to justify hierarchies and stereotypes. This option states the opposite instead of explaining what the flaw is. Hence, Option A is not the answer.

Option B: Consider the sentence: 'Blueprint conveys that traits such as intelligence or mental health—vulnerability to schizophrenia or autism, say—***are not determined by a few genes, but influenced by tens, hundreds or even thousands of them***.' Traits such as intelligence are not determined by a few genes and hence, eugenics cannot really aim to get rid of the bad mutations and breed the good part. This is the fundamental flaw that the author is talking about. Hence, Option B is the answer.

Option C: This agrees with eugenics by stating that bad mutations can be weeded out – that belief itself is fundamentally flawed according to the passage because traits are not influenced by specific genes, which can be gotten rid of; rather they are influenced by several, which means getting rid of one or two genes doesn't achieve anything. Genetic correction to improve traits cannot be considered. Hence, Option C is not the answer.

Option D: This is more a consequence rather than a flaw in believing traits are influenced by a few specific genes. Hence, Option D is not the answer.

Choice (B)

Q19. The criticism unleashed against Plomin's research is that it

a) **lacked hard evidence.**

b) was based on scarce genomic data.

c) **was quasi-fascistic.**

d) **was ethically flawed.**

Text Solution

Number of words and Explanatory notes for RC:

Number of words: 588

Consider the sentences: He has seen his research [being] ***denounced as irresponsible*** and ***even quasi-fascistic*** – not to mention ***scientifically mistaken***. He has seen the field suffer from false claims and a lack of hard evidence. Plomin has been criticised for his study – as per the underscored parts.
Option A: The field of genetics, according to Plomin, has suffered from false claims and a lack of hard evidence. It is not his research that has been blamed for lack of evidence. Hence, Option A is not the answer.
Option B: Plomin's research became possible, and he could prove his detractors wrong because of plentiful genomic data that became available. Hence, Option B is not a criticism levied against Plomin
Option C: Quasi-fascistic is one of the accusations levied on Plomin and his genetic research. Hence, Option C is the answer.
Option D: Plomin's work has been criticised for being scientifically mistaken. However, nothing has been mentioned about his work being ethically flawed. Hence, Option D is not the answer.
Choice (C)

Q20. The purpose of philosophy is to keep interest alive in all of the following questions EXCEPT:

a) **Do we evade death till eternity?**

b) Do mind and matter function independently to an extent?

c) **Is it purpose that drives the universe?**

d) **Does astronomy undermine the self-importance associated with life?**

Text Solution

Number of words and Explanatory notes for RC:

Number of words: 566

Consider the sentence: 'Russell discusses the nature, purpose and importance of philosophy… in a set of questions belonging to philosophical inquiry: "***Do we survive death in any sense***, and if so, ***do we survive for a time or for ever***? ***Can mind dominate matter, or does matter completely dominate mind***, or has each a certain limited independence? ***Has the universe a purpose***? ...If there is a cosmic scheme, ***has life more importance in it than astronomy would lead us to suppose***, or is our emphasis upon life mere parochialism and self-importance?"'

Option A: From 'Do we survive death, and if yes, do we survive it for a while or forever', we can understand that one of the questions Russell asks is about whether death can be permanently avoided. Hence, Option A is one of the questions in which philosophy keeps the interest alive. Option A is not the answer.

Option B: From '***Can mind dominate matter, or does matter completely dominate mind***, or has each a certain limited independence' we can understand that Russell is asking ***whether one dominates the other*** or ***whether they both have certain independence***. Hence, Option B is not the answer.

Option C: This is a direct question asked by Russell about the purpose of universe. (Is it possible to have a purpose – the question asked by Russell – and yet, not be driven by it though? One must understand that the term 'driven' itself is related to having a purpose. So, having a purpose and driven by a purpose aren't two different things. Option C is not the answer.

Option D: Has life more importance in it than astronomy would lead us to suppose? In this question, Russell implies that astronomy may be undermining the importance of life (he also asks the counter-question about the possibility of life being unimportant and our own parochialism or narrow-minded viewpoint seeing it as important). So, Russell indicates that ***astronomy reduces the importance of life***, thereby reducing the possible parochialism in self-importance. In other words, astronomy doesn't undermine (weaken) the view that ***we may be parochial in believing life is important***. Hence, Option D is not one of the questions asked by Russell.

Choice (D)

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.

When we philosophers try to defend our discipline, the question of why philosophy is important sometimes gets entangled with our own self-importance. When we seek to protect philosophy, we are also protecting our livelihood. There is an irony here, since philosophers often present

themselves as thinkers who attain a supreme objectivity in relation to whatever issues they engage with.

The question of our objectivity concerning the significance of philosophy gives us good reason to listen to Bertrand Russell's views on this subject. Russell was more than a philosopher: he was also a mathematician, a peace campaigner, an educator, a populariser of modern science and a cultural critic. The range and diversity of his work makes him well-placed to comment on the value of philosophy, for he appreciated the relationship between philosophy and other kinds of inquiry. And Russell more than once showed himself to be committed to the pursuit of truth even when this jeopardised his professional life [or conflicted with his earlier work].

[In his 1946 essay, Philosophy for Laymen,] Russell discusses the nature, purpose and importance of philosophy… in a set of questions belonging to philosophical inquiry: "Do we survive death in any sense, and if so, do we survive for a time or for ever? Can mind dominate matter, or does matter completely dominate mind, or has each a certain limited independence? Has the universe a purpose? ...If there is a cosmic scheme, has life more importance in it than astronomy would lead us to suppose, or is our emphasis upon life mere parochialism and self-importance?"

He continues: "Human life would be impoverished if they were forgotten, or if definite answers were accepted without adequate evidence." One important purpose of philosophy, therefore, is to keep interest in these questions alive…

Socrates argues … that the philosopher's pursuit of truth involves reorienting his whole soul towards the good, as well as theoretical clarification of what the soul is and what its good consists in. Russell stands in this tradition, arguing that "if philosophy is to play a serious part [in the lives of men who are not specialists], it must not cease to advocate some way of life". He identifies key differences between philosophical and religious approaches to living well: philosophy refuses any appeal to the authority of a tradition or a sacred book.

Russell evidently regarded authoritarianism as the essence of religion, and on this basis his philosophy is emphatically anti-religious. An ethically oriented scepticism lies at the heart of his own conception of a properly philosophical way of life. For Russell, philosophy should lead to peace ... "Dogmatism is an enemy to peace, and an insuperable barrier to democracy," he writes. Even

minimal philosophical training, he argues, would teach us to see through the "bloodthirsty nonsense" preached in the name of nationalist, sectarian interests – and also, in the name of democracy.

Russell teaches his "laymen" readers to think more objectively about emotive issues: "When [in a sentence expressing political opinion] there are words that arouse powerful but different emotions in different readers, try replacing them by symbols, A, B, C, and so on and forgetting the particular significance of the symbols. Suppose A is England, B is Germany and C is Russia. So long as you remember what the letters mean, most of the things you will believe will depend upon whether you are English, German or Russian, which is logically irrelevant."

Q21. Russell exhorts use of symbols in political opinions

a) **because it is difficult to forget the significance of symbols.**

b) to remember the emotional significance of the words.

c) **because laymen cannot think emotively about objective issues.**

d) **to avoid logically irrelevant bias.**

Number of words and Explanatory notes for RC:

Number of words: 566

Consider the sentences: 'When [in a sentence expressing political opinion] there are ***words that arouse powerful but different emotions in different readers***, try replacing them by symbols, A, B, C, and so on and ***forgetting the particular significance of the symbols***. Suppose A is England, B is Germany and C is Russia. So long as you remember what the letters mean, ***most of the things you will believe will depend upon whether you are English, German or Russian***, which is logically irrelevant.' It is important to replace powerful words that evoke emotions (like German/English/Russian) with symbols so that one can think logically without the influence of emotions, since symbols do not have any particular significance.

Option A: If this were true, the advice itself will become pointless. The advice is to forget the significance of symbols so one can forget emotions and take logical decisions. Hence, Option A is not the answer.

Option B: The idea is to avoid remembering the emotional significance of words as that would evoke emotions which affect our logic. Emotions are logically irrelevant as implied in the para. Hence, Option B is not the answer.

Option C: Not thinking emotively is a boon, as that would help one avoid logical irrelevance and be more objective. Hence, Option C is not the answer.

Option D: In order to avoid logically irrelevant bias, one must avoid words that are associated to emotions and instead use symbols which can give us clarity of thought because all symbols are same. A, B, and C for example do not evoke emotions the same ways English/Russian/German. So, symbols help one avoid emotions which lead to bias. Hence, Option D is the answer. Choice (D)

Q22. A philosophical approach differs from a religious approach, according to Russell, in that the former:

a) **doesn't appeal to any authority.**

b) subscribes to a tradition or a sacred book.

c) **isn't based on traditional values.**

d) **doesn't have any literature.**

Text Solution

Number of words and Explanatory notes for RC:

Number of words: 566

Consider the sentences: He identifies key differences between philosophical and religious approaches to living well: ***philosophy refuses any appeal to the authority of a tradition or a sacred book***.
Option A: Consider the sentence: 'He identifies key differences between philosophical and religious approaches to living well: philosophy refuses any appeal to the authority of a tradition or a sacred book.' From this we can understand that philosophy stays away from authoritarianism of any sort. Hence, Option A is the answer.
Option B: Philosophy (the former) doesn't subscribe/follow a sacred book. It is religion that does. Philosophy doesn't have an authority as its very essence. Therefore, Option B is inaccurate.
Option C: Philosophy doesn't make tradition / orthodoxy / conventionalism the primary goal. This is not the same as saying philosophy is not based on traditional values. Option C is not the answer.
Option D: Not appealing to the authority of a book – doesn't imply not having any literature whatsoever. It is just that there is no one 'sacred' book which is deemed the authority. Hence, Option D is not the answer. Choice (A)

Q23. The irony in philosophers protecting philosophy is that:

a) **it is closely linked to their sense of self-importance.**

b) they are not concerned about their livelihood.

c) **they are staying relevant.**

d) **they are not being objective.**

Text Solution

Number of words and Explanatory notes for RC:

Number of words: 566

Consider the para: When we philosophers try to defend our discipline, the question of why philosophy is important sometimes gets entangled with our own self-importance. ***When we seek to protect philosophy, we are also protecting our livelihood.*** There is an irony here, ***since philosophers often present themselves as thinkers who attain a supreme objectivity*** in relation to whatever issues they engage with. The irony here is that philosophers are supposed to be objective – no ulterior motive, no conflicts with what they are doing, only focusing on logic.

Option A: Philosophers may be trying to save philosophy because their livelihood depends on it. That is a conflict of interest. However, their own sense of self-importance has not been mentioned by the author, nor is that affecting their judgment in any way. Hence, Option A can be eliminated.

Option B: Philosophers earning their livelihood while doing what they are doing indicates the irony being referred to in the passage. The irony here is that someone who is looking to earn his/her livelihood may not exactly be objective enough. 'Not concerned about their livelihood' is therefore, contradictory. Hence, Option B is not the answer.

Option C: Trying to stay relevant is not necessarily depicting loss of objectivity. Hence, Option C is not the answer.

Option D: Their not being objective is the irony here. Irony is where there is incongruence between expected result and actual event. Philosophers are expected to remain objective. But, they are not, if they are worried about livelihood. Hence, Option D is the answer.

Choice (D)

Q24. All of the following are reasons we should listen to Bertrand Russell, according to the author, EXCEPT:

a) **Russell's diverse work adds value to his views on philosophy.**

b) Russell approved of the relationship between philosophy and other kinds of inquiry.

c) **Russell put truth ahead of his professional life.**

d) **Russell's work is in conflict with philosophical truths pursued by him.**

Text Solution

Number of words and Explanatory notes for RC:

Number of words: 566

The second para gives us all the information that we need. Consider the sentences: 'The question of our objectivity concerning the significance of philosophy gives us good reason to listen to Bertrand Russell's views on this subject. Russell was more than a philosopher: he was also ***a mathematician, a peace campaigner, an educator, a populariser of modern science and a cultural critic***. The ***range and diversity of his work*** makes him ***well-placed to comment on the value of philosophy***, for he ***appreciated the relationship between philosophy and other kinds of inquiry***. And Russell more than once showed himself to be ***committed to the pursuit of truth even when this jeopardised his professional life*** [or conflicted with his earlier work].'

Option A: The ***range and diversity of his work*** makes him ***well-placed to comment on the value of philosophy.*** From this, we can understand that one of the reasons why Russell's opinions were highly regarded by the author is that his work was diverse – and the author implies that the diversity of his work implies a broader knowledge base and greater ability to understand the value of philosophy. Option A is not the answer.

Option B: From 'he ***appreciated the relationship between philosophy and other kinds of inquiry***' we can understand that Russell did believe there was a link between philosophy and other forms/kinds of enquiry. He approved of it – can be implied by the fact that the author feels his appreciation makes him a voice of authority. Option B is not the answer.

Option C: Russell, according to the author, was committed to the pursuit of truth even if it put his professional life in jeopardy (detrimental to his profession/career/standing). Therefore, his was a sincere voice that the author feels has a lot of credibility. Hence, Option C cannot be the answer.

Option D: Russell pursued truth even if it conflicted with his earlier work. In other words, Russell ***never shied away from the truth even it meant he was proven wrong by himself*** or if there were conflicts between his present and past work. That doesn't mean his work is necessarily conflicted by the ***philosophical truths pursued by him***. Option D is therefore, the answer. Choice (D)

Q25. DIRECTIONS *for question 25*: The sentences given in the 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. No Deal basically means that if we can't find a solution that would benefit us both, we agree to disagree agreeably.
2. In other words, no expectations have been created, no performance contracts established.

3. It is so much better to realize these important points upfront instead of downstream when expectations have been created and both parties have been disillusioned.
4. For example, I don't hire you or we don't take on a particular assignment together because it's obvious that our values or our goals are going in opposite directions.

Text Solution

Sentence 1: Sentence 1 is a general sentence that defines what "No Deal" means.
Sentence 2: Sentence 2 has the pronoun 'it'. It continues to tell us the meaning of something.
Sentence 3: Sentence 3 has the demonstrative adjective "these points".
Sentence 4: Sentence 4 exemplifies the definition of "No Deal".
Sentence 1 is a general sentence that begins the paragraph. It explains what "No Deal" means. Sentences 1 and 2 form a mandatory pair. "No Deal basically means" in sentence 1 links with "In other words" in sentence 2. "We agree to disagree" in sentence 1 is parallel to "no expectations have been created, no performance contracts established" in sentence 2. The defining points mentioned in sentences 1 and 2 are exemplified in sentence 4. "I don't hire you or we don't take on a particular assignment together" in sentence 4 links with "we agree to disagree agreeably" given earlier in sentence 1. Also "our values or our goals are going in opposite directions" in sentence 4 links with "zwe can't find a solution that would benefit us both" given earlier in sentence 1. So, 124. Sentence 3 concludes the para. "these points" in sentence 3 summarizes what has been mentioned in sentences 1, 2 and 4. "expectations have been created and both parties have been disillusioned (downstream)" in sentence 3 contrasts "no expectations have been created, no performance contracts established" in sentence 2 and "we agree to disagree agreeably" in sentence 1.
Note that sentence 3 cannot be placed immediately after sentences 1 and 2. "realize these important points" in sentence 3 cannot directly relate to "no expectations have been created, no performance contracts established" given in sentence 2. "when expectations have been created and both parties have been disillusioned" is repeated in sentence 3. So sentence 3 immediately after sentence 2 would amount to "circular reasoning fallacy". That would also mean placing sentence 4 (with the example) wrongly at the end of the para. Sentence 4 would be an abrupt ending to the para. Hence sentence 4 has to precede sentences 1 and 2. So, 1243. Ans: (1243)

Q26. DIRECTIONS *for question 26*: 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. Some art can exist just as well in silence and obscurity as on the pages of newspapers.
2. The same is true of real modern art.
3. Banksy's art has no life as art, no aesthetic or even anti-aesthetic effect, no content beyond the trite, no personality.
4. The Mona Lisa is always being talked about, but even if no one ever again concocted a headline about this roughly 510-year-old painting it would still be as great.
5. It is an archetypal product of our society: it exists only to be talked about, the perfect message for social media.

Text Solution

Sentence 1 depicts 'some art' in a positive way – it can exist anywhere. It also introduces a contrast between silence and obscurity on one hand and 'pages of a newspaper' on the other hand – attention and media.
Sentence 2 connects modern art with something else using the connecting term 'the same'.
Sentence 3 talks about Banksy's art in a negative light as understood by 'no content beyond the trite'.
Sentence 4 is an example, but the example has contrasts – 'always being talked about' and 'no one concocted a headline'. Therefore, it can be understood that 14 is a pair, based on tone and idea.
Sentence 5 talks about something as an archetypal product of our society. The 'it' can be 'modern art' in 2, 'some art' in 1 or Banksy's art in 3. It exists 'only to be talked about' doesn't present contrast. It is subtly negative. Hence, this is an extension of 3. 'It' is not modern art, because of the use of the 'same' in 2. Modern art cannot be equated to Banksy's art as one is a specific and one is a generic term – a category as an example. So modern art is similar to some art in 1, which means modern art is positive according to the author.
So, 1 and 4 are a pair. 3 and 5 represent a pair. While 2 is part of the idea, it cannot form a coherent connection with the other two pairs. Ans: (2)

Q27. DIRECTIONS *for question 27*: The paragraph given below is followed by four summaries. Choose the option that best captures the author's position.

The common notion that the unrestrained pursuit of self-interest is beneficial for all is illusory. The "I" world brings out the worst in people. It breeds a toxic social, economic and political environment. The ideological tensions and extreme political partisanship present in many countries also find their

source in narcissism. Self-focused world leaders, interested in short-term gains, lack the empathy to view issues and situations from the perspective of others. This neglect of community results in a series of powder kegs with potentially catastrophic consequences, including the destruction of our planet.

a) **Contrary to common belief, narcissism pollutes the environment and creates leaders whose lack of empathy costs the planet dearly.**

b) Narcissism, contrary to popular opinion, creates a conflicted environment where lack of empathy leads to disastrous consequences.

c) **The pursuit of unrestrained self-interest creates strife and eliminates empathy, leading to dire consequences.**

d) **World leaders who lack empathy and pursue short-term gains are the by-product of a toxic social, political and economic environment.**

Text Solution

Main ideas:
The unrestrained pursuit of self-interest (equated to narcissism) is not beneficial as it is believed to be. Rather, it creates a bad environment.
It is also the source of strife in the world, thanks to narcissistic leaders without empathy. This has disastrous consequences.
Option A: While most of what this summary says resonates with the para, there is inaccuracy in attributing the cause of the rise of leaders to narcissism. Narcissism doesn't create the leaders. Narcissistic leaders create the problems. Hence, Option A, while reasonably close is not the best summary.
Option B: Narcissism creates a conflicted environment (toxic), and a lack of empathy, attributed to narcissists has negative consequences. Both the main ideas have been mentioned. Please note, the summary sticks to the idea rather than zeroing on the specifics, for example, world leaders and their attitudes. Option B is a good summary.
Option C: 'Unrestrained' self-interest (wrong) is not the same as 'unrestrained pursuit' of self-interest (correct). That aside narcissism is equated to the absence of empathy (in a far-fetched way). Narcissism doesn't eliminate empathy. Hence, Option C is not the answer.
Option D: World leaders, who are narcissistic, lack empathy and pursue short-term gains. This is true. However, it cannot be inferred from the para that they are the by-products of a toxic environment. As per the given para, narcissism breeds a toxic environment, and it is narcissism in leaders which leads to catastrophic consequences. Option D is not the answer. Choice (B)

Q28. DIRECTIONS *for question 28*: The sentences given in the 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. One secret letter talked about how a doctor asked fellow Red Army survivors to write to her with their memories even as Soviet censors stopped her from publishing her account.
2. In 2010, Czyz's daughter discovered 27 of these secret letters in her grandmother's old rolling pin and a chopping board.
3. Using urine as invisible ink in censored letters, Krysia Czyz and other Polish prisoners told their families about their whereabouts and the obscene medical experiments being carried out on them.
4. Ravensbruck's concentration camp inmates, taken away on death transports, hid notes in their clothes for their friends in the camp to find, when their clothes were returned there, telling them their new location.

Sentence 1: Sentence 1 has the reference to "one secret letter" and its contents.
Sentence 2: Sentence 2 has the demonstrative adjective "these secret letters". It has the half name "Czyz".
Sentence 3: Sentence 3 talks about how the women prisoners communicated with others as to what evils they were being subjected to. It has the clues "censored letters", "whereabouts" and "obscene medical experiments". It also has the full name of the prisoner "Krysia Czyz".
Sentence 4: Sentence 4 mentions the name of a concentration camp and also speaks about the fact that women inmates who were taken away hid notes in their clothes ....
On a careful reading of the sentences, it has been observed that sentence 4 is the only general sentence that can begin the paragraph. The remaining sentences need a precedent and more substantiation. Sentence 4 is followed by sentence 3. "Krysia Czyz and other Polish prisoners" in sentence 3 links with "Women from the Ravensbruck's concentration camp" in sentence 4. "hid notes for their friends in the camp to find" in sentence 4 links with "using urine as invisible ink in censored letters" in sentence 3. "telling them where they were being taken" in sentence 4 links with "their whereabouts and the obscene medical experiments being carried out on them" in sentence 3. Sentence 3 is followed by sentence 2. "Czyz's daughter discovered 27 of these secret letters" in sentence 2 links with "Using urine as invisible ink in censored letters, Krysia Czyz" in sentence 3. Sentence 2 is followed by sentence 1. "One secret letter" in sentence 1 links with "27 of these secret letters" in sentence 2. "asked fellow Red Army survivors to write to her with their memories" in sentence 1 is parallel to "telling them where they were being taken" in sentence 4 and "told their families about their whereabouts and the obscene medical experiments being carried out on them" in sentence 3. "Soviet censors stopped her from publishing her account" in sentence 1 is parallel to "censored letters" in sentence 3. So, 4321. Ans: (4321)

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. Of course, the speed of sound depends on how high above sea level the plane is and what the temperature is.
2. And the supersonic boom of the Concorde or Space Shuttle was caused not by one shock wave but the interaction of a series of shock waves radiating from different parts of the aircraft.
3. That creates an instantaneous change in pressure, resulting in a shock wave that contains a huge amount of sound energy.

4. However, once an aircraft accelerates beyond the speed of sound (above Mach 1), the air molecules simply can't get out of the way fast enough but pile up at certain points on the aircraft.
5. Below Mach 1, the molecules of air in front of an aircraft are pushed out of the way, much as a boat travelling through water creates a bow or stern wave.

Text Solution

Sentence 1: Sentence 1 mentions a general statement related to the speed of sound.
Sentence 2: Sentence 2 brings in the idea of the supersonic boom created by the Concorde or Space Shuttle. It has the clues "not one but a series of shock waves".
Sentence 3: Sentence 3 has the demonstrative pronoun 'that'. It has the clue 'shock wave'.
Sentence 4: Sentence 4 has a contrast conjunction 'however'. It tells us what happens to the air molecules as the aircraft moves beyond Mach 1(i.e. beyond the speed of sound).
Sentence 5: Sentence 5 tells us what happens to the air molecules in front of an aircraft as the latter moves at a speed below Mach 1.
Sentence 5 is a general sentence that begins the para. Sentence 4 (Below Mach 1) with the contrast conjunction 'however' follows sentence 5 (once an aircraft accelerates beyond Mach 1). "air molecules are pushed out of the way" in sentence 5 contrasts " air molecules simply can't get out of the way fast enough" in sentence 4. Sentence 4 is followed by sentence 3. "That creates an instantaneous change in pressure" in sentence 3 is a consequence of "air molecules simply can't get out of the way fast enough but pile up at certain points on the aircraft" in sentence 4. Sentence 2 which has the examples of the supersonic boom of the Concorde or Space Shuttle follows sentence 3. "resulting in a shock wave" in sentence 3 is substantiated further by "caused not by one shock wave but the interaction of a series of shock waves" in sentence 2. "radiating from different parts of the aircraft" in sentence 2 links with "pile up at certain points on the aircraft" mentioned earlier in sentence 4. So, 5432.
Sentence 1 is the odd sentence out. It tells us what the speed of sound depends on. This sentence runs tangent to the topic of discussion which expand on how (a) shock wave(s) is/ are created at different points of an aircraft. Ans: (1)

Q30. DIRECTIONS *for question 30*: The sentences given in the 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. The more important the task that you complete, the greater the quantity of endorphins that your brain releases.
2. Every time you complete a task of any kind, your brain releases a small quantity of endorphins.
3. Over time, you can develop a positive addiction to the feelings of well-being that you receive from this “endorphin rush”.
4. These natural morphine-like compounds give you a sense of well-being and elation, stimulate your creativity and improve your personality.

Text Solution

Sentence 1: Sentence 1 mentions the relation between 'task' and 'endorphins'. Note the use of 'the more important **the** task".
Sentence 2: Sentence 2 talks about the brain releasing some endorphins. Note the use of '**a** task'.
Sentence 3: Sentence 3 has the clues "over time" and "endorphin rush".
Sentence 4: Sentence 4 has the pronoun 'these'. The sentence explains the function of endorphins.
So, sentence 2 is a general sentence that begins the para. It introduces the topic of discussion: complete a task .... release of endorphins by the brain. Note that sentence 2 needs to precede sentence 1. "task of any kind" in sentence 2 is more general in tone than "the more important the task you complete" in sentence 1. Also "every time" in sentence 2 is a generalization.
Sentence 2 is followed by sentence 4. "these natural morphine-like compounds" in sentence 4 points to "endorphins" in sentence 2. "sense of well-being and elation, stimulate your creativity and improve your personality" in sentence 4 are consequences of "brain releases a small quantity of endorphins" mentioned in sentence 2. Sentence 4 is followed by sentence 1. Sentence 1 talks about the enormous quantity of endorphins released by the brain when the task is more important. Sentences 1 and 3 form a logical block. "the greater the quantity of endorphins that your brain releases" in sentence 1 links with "endorphin rush" in sentence 3. Also "positive addiction to the feelings of well-being that you receive" in sentence 3 is parallel to "give you a sense of well-being and elation, stimulate your creativity and improve your personality" given earlier in sentence 4. So, 2413. The conclusion sentence 3 (*over time*) mirrors the introduction sentence 2 (*every time*).
Ans: (2413)

Q31. DIRECTIONS *for question 31*: 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. By touch alone, this tactile visual aid can help travellers with visual impairments orient themselves among the real town's streets and buildings.
2. This is not just a model but it's also a tactile map of Landshut, Germany, and it's meant to be explored with your fingertips.
3. World Braille Day is an event observed each year on the birthday of Louis Braille, who created Braille in 1824.
4. The map is also embossed with the raised dots used in Braille's writing system, employed here to identify important parts of the town.

5. The miniature representation of this Bavarian town includes local landmarks like the towering St. Martin's church, the tallest church in Bavaria and the second tallest brick structure in the world.

Text Solution

Sentence 1: Sentence 1 has the demonstrative adjective 'this'. 'this tactile aid' indicates that sentence 1 would need a sentence preceding it.
Sentence 2: Sentence 2 has a "not just ... but also" sequence. It mentions tactile map of a location.
Sentence 3: Sentence 3 is related to "World Braille Day".
Sentence 4: Sentence 4 has the clue 'also'.
Sentence 5: Sentence 5 tells us what the miniature representation of the town includes.
So, sentence 2 is a general sentence that begins the para. It lays the foundation of the para and all the remaining sentence flow from it. Sentences 2 and 1 form a logical block. "By touch alone" in sentence 1 links with "meant to be explored with your fingertips" in sentence 2. And "this tactile visual aid" in sentence 1 links with "tactile map" in sentence 2. Sentence 1 is followed by sentence 5. "orient themselves among the real town's ..." in sentence 1 links with "miniature representation of this Bavarian town" in sentence 5. "St. Martin's church, the tallest church in Bavaria and the second tallest brick structure in the world" in sentence 5 points to "streets and buildings" in sentence 1. Sentence 5 is followed by sentence 4. "The miniature representation includes" in sentence 5 links with "The map is also embossed with the raised dots ...." in sentence 4. So, 2154.
Sentence 3 is the odd sentence out. It is not related to the tactile map or visual aid discussed in the remaining sentences. This sentence can belong to another text or passage altogether. Ans: (3)

Q32. DIRECTIONS *for question 32*: The paragraph given below is followed by four summaries. Choose the option that best captures the author's position.

1992 was the last year that the Welsh curriculum let English speaking schoolgirls from Swansea drop Welsh language lessons in favour of French or German. The Welsh Language Act of 1993 changed the scenario. The country's mother tongue was given equal footing with English in the public sector, and soon after, road signs began turning bilingual and the Welsh language became a compulsory subject in schools until the age of 16. Instead of withering on the vine like Cornish and the variants of Gaelic, Welsh budded, blossomed and bloomed. The 2001 census showed the first

rise in Welsh speakers in 100 years, from 508,000 to 582,000. The big increase of Welsh speaking was in the 5-24 age group. Youngsters have reclaimed Welsh as their own. It's no longer the language of hearth, home and chapel – it's also the language of everyday conversation, of blogs and of music.

a) **Welsh seemed like a doomed language in Wales but now it is an obligatory language in schools and in society at large.**

b) The Welsh Language Act helped increase the popularity of the language among youngsters and has become an everyday language.

c) **The youth culture in Wales helped revive the Welsh language, which is now the language of daily conversation and writing in Wales.**

d) **Welsh seemed to be in terminal decline just like Cornish and Gaelic variants, but the great Welsh language revival arrested this decline.**

Text Solution

Option A: Nowhere does the para mention that Welsh was a doomed language. So choice A is distorted. It is also incomplete as a summary.
Option B: Choice B concisely summarizes all the main points of the para.
Option C: The para does not mention the fact that youth culture is booming in Wales. It only tells us that youngsters have reclaimed Welsh as their own and there is an increase in the number of Welsh speakers in Wales. So choice C is out of scope.
Option D: As explained in choice A, "Welsh seemed to be in terminal decline" in choice D is incorrect. "just like Cornish and Gaelic variants" is an inappropriate comparison. Choice D is wrong. Choice (B)

Q33. DIRECTIONS *for question 33*: The sentences given in the 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. But once he could no longer write down equations, theories had to be translated into geometry in his head.
2. His words necessarily became so few and his theories of everything emerged in a voice that was both robotic, and curiously laden with emotion.
3. In his youth, Stephen Hawking never lacked mathematical acumen.
4. And after a tracheotomy in 1985, the ocean of his thinking had to be forced through a cumbersome and narrow technological aperture.

Text Solution

Sentence 1: Sentence 1 has the contrast conjunction 'but'.
Sentence 2: Sentence 2 mentions some consequences of his illness, mainly how his voice was affected.
Sentence 3: Sentence 3 has the proper noun "Stephen Hawking".
Sentence 4: Sentence 4 has the conjunction 'and' and it mentions how a tracheotomy in 1985 affected him.
So, sentence 3 is a general standalone sentence that can begin the paragraph (In youth, ...). Sentence 3 is followed by sentence 1. The contrast conjunction 'but' in sentence 1 contrasts the point in sentence 3. i.e. "Once he could no longer write down equations" in sentence 1 contrasts "In youth" in sentence 3. Also "theories had to be translated into geometry" in sentence 1 contrasts "never lacked confidence" in sentence 3. Sentence 1 is followed by sentence 4. "And after a tracheotomy in 1985" in sentence 4 links with "once he could no longer write down equations" in sentence 1. "theories had to be translated into geometry in his head" in sentence 1 runs parallel to "the ocean of his thinking had to be forced through a cumbersome and narrow technological aperture" in sentence 4. Sentence 4 is followed by sentence 2. "ocean of his thinking" in sentence 4 links with "his theories of everything" in sentence 2. " ... emerged in a voice that was both robotic, and curiously laden with emotion" in sentence 2 is a consequence of "....had to be forced through a cumbersome and narrow technological aperture" in sentence 4. So, 3142. Ans: (3142)

Q34. DIRECTIONS *for question 34*: The paragraph given below is followed by four summaries. Choose the option that best captures the author's position.

Apple has always been an opportunistic innovator, seeking to capitalise on the next "big thing" with a powerful brand, superior design and user-friendliness, not to mention an efficient global supply system. But where the iPod, iPhone and iPad have driven growth in the past, it's not yet clear what

the next big thing will be. Though successful, connected watches did not quite deliver. Voice-controlled intelligent homes and self-driving cars offer major opportunities, but Apple is not as strongly positioned as Amazon and Google in the former case and carmakers (Tesla included) in the latter. So, as we have seen with the protracted transition from products to services at other big ICT companies such as IBM, Apple's shareholders may just have to be patient until the transition to ecosystem opportunities and services pays off.

a) **One has to wait to see when Apple's current bet on ecosystem opportunities will come off the way some of its past innovations have paid off.**

b) Apple is stuttering in its strategy of capitalising on the next big thing owing to the competition from other well-known brands.

c) **While Apple's innovations succeeded in the past, its transition to ecosystem opportunities is in choppy waters.**

d) **The rise of competition has adversely affected Apple's business, particularly its plan to cash in on ecosystem innovations.**

Text Solution

Main ideas:
Apple has done well in the past by innovating and capitalising on the next big thing.
However, the next success is proving to be a little elusive.
Apple is investing in ecosystem opportunities, but one needs patience until the strategy pays off.
Option A: 'One has to wait to see' when Apple's strategy will pay dividends. This is the main idea. The author is not pessimistic about Apple's strategy, and that has to be noted. The author isn't too optimistic. The summary also points to 'some' of the past innovations which have paid off. This choice, more or less, represents the central concern of the para, which is about when (and not 'if') Apple's plan to pursue ecosystem opportunities will pay off. Hence, Option A is a good summary.
Option B: While Apple hasn't had a major success, that its strategy is 'stuttering' is far-fetched and not the exact essence of the para. Also, this option indicates there is competition from some brands across all products, which is not true. There are specific brand leaders in different domains Apple is focusing on. Hence, Option B is not accurate.
Option C: This choice concludes that Apple's current transition is in a bad place (choppy waters). That is extravagant, not to mention the absence of reasoning as to why this is the conclusion. Hence, Option C is not the answer.
Option D: This option is inaccurate in two ways: we cannot quite define that there is a rise in competition now that didn't exist earlier. We cannot really proclaim that it is affecting Apple's business. 'Particularly' suggests all the businesses of Apple are being affected, ecosystem innovations being one of them. However, that is not true. The para only talks about competition with respect to ecosystem opportunities. Hence, Option D is easy to eliminate.

Choice (A)

LRDI

DIRECTIONS *for questions 1 to 4:* Answer the questions on the basis of the information given below.

Each of nine persons, P, Q, R, S, T, U, V, W and X, lives in a different flat in an apartment building, which has six floors (excluding the ground floor, which is used only for parking) and three flats on each floor. The three flats on each floor are in a row and no two adjacent flats on a floor are occupied. At least one person lives on each floor.

Further, the following information is known:

i. P and Q live on the same floor.
ii. R and S live on different floors.

iii. T lives in the middle flat on the fourth floor.

iv. U lives on the sixth floor and V lives on the first floor.

v. W lives on the floor which is immediately above the floor on which X lives.

Q1. DIRECTIONS *for questions 1 and 2:* Select the correct alternative from the given choices.

If W and U do not live on the same floor, then which of the following cannot be true?

a) **W lives on the third floor.**

b) Q lives on the third floor.

c) **R lives on the second floor.**

d) **P lives on the second floor.**

Text Solution

As there are nine persons and six floors, there must be three floors with two persons each and three floors with one person each.

Given, W and U live on different floors. As W and X live on two consecutive floors, as per the given conditions those two must be either 3rd and 2nd or 2nd and 1st.
So, one among them must be on the 2nd floor.
If P lives on the second floor, Q must also be there.
Hence, (D) is false. Choice (D)

Q2. DIRECTIONS *for questions 1 and 2:* Select the correct alternative from the given choices.

If S and R are living on the first floor and the sixth floor respectively, then which of the following must be true?

a) **T is living on the same floor as X.**

b) Q is living on the second floor.

c) **P is living on the third floor.**

d) **W is living alone on his floor.**

Text Solution

As there are nine persons and six floors, there must be three floors with two persons each and three floors with one person each.

As per the given conditions, U and R live on the sixth floor and S and V live on the first floor.
So, T, W and X must live alone on their respective floors. As, W and X are in two consecutive floors, those two floors must be third and second floor.
So, only option (D) must be true. Choice (D)

Q3. DIRECTIONS *for question 3:* Type in your answer in the input box provided below the question.

If Q lives on the third floor, then how many combinations of persons could live on the second floor?

Text Solution

As there are nine persons and six floors, there must be three floors with two persons each and three floors with one person each.

Q is on the third floor means, P is also on the third floor.
If there is only one person on the second floor, then that person can be W or R or S.
If there are two persons, then it must be W along with R or S.
∴ A total of 5 combinations of persons are possible. Ans: (5)

Q4. DIRECTIONS *for question 4:* Select the correct alternative from the given choices.

If P lives on the fifth floor, then on which of the following floors can X live?

a) **Sixth**

b) Fourth

c) **Third**

d) **Second**

Text Solution

As there are nine persons and six floors, there must be three floors with two persons each and three floors with one person each.

X cannot live on the sixth floor, since W cannot live on the floor above X.
X cannot live in the fourth floor, as he will have to stay in a flat adjacent to T's flat. X cannot live in the third floor, as W cannot live in fourth floor.
Hence, X can live only in the second floor. Choice (D)

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

In a chess tournament, each of the ten players, A through J, played every other player exactly once. one point is awarded for a win, half a point for a draw and 0 points for a loss. The player with the highest number of points, at the end of all the matches, is ranked first and he will be the winner of the tournament. The player with the next highest number of points is ranked second, the next one, third, and so on. If two players end up with the same number of points, the one with more number of wins is ranked better among the two. If two players have the same number of points as well as wins, both of them will be ranked the same. The following is a partially filled table of points scored by the players at the end of the tournament.

Player	A	B	C	D	E	F	G	H	I	J
A	–	1/2	1		1		1	0		1/2
B		–		1	0		1	1	0	1
C		0	–	1/2	1		1/2	1	0	
D	1/2			–	1/2	1				
E					–				0	1/2
F	1	1/2	1		1/2	–				
G				1/2	0	1	–	1	0	1
H				1/2	1	1/2		–	1/2	
I	1/2			0		1			–	1
J			1/2	1		1/2		0		–

In the above table, the number of points scored by some players in the matches against some of the other players are given. For example, A scored 1 point in the match against C.

Q5. DIRECTIONS *for questions 5 to 7:* Select the correct alternative from the given choices.

Which player was ranked second in the tournament?

a) **A**

b) B

c) **H**

d) **I**

The table can be filled as follows:
In the game between A and B, A got 1/2 point or the match ended in a draw. So B also gets 1/2 point, while in the game between A and C, A got 1 point or A won the game and so C who lost the game gets zero points.
The table, when filled will be as follows:

Player	A	B	C	D	E	F	G	H	I	J	Total
A	X	1/2	1	1/2	1	0	1	0	1/2	1/2	5
B	1/2	X	1	1	0	1/2	1	1	0	1	6
C	0	0	X	1/2	1	0	1/2	1	0	1/2	3½
D	1/2	0	1/2	X	1/2	1	1/2	1/2	1	0	4½
E	0	1	0	1/2	X	1/2	1	0	0	1/2	3½
F	1	1/2	1	0	1/2	X	0	1/2	0	1/2	4
G	0	0	1/2	1/2	0	1	X	1	0	1	4
H	1	0	0	1/2	1	1/2	0	X	1/2	1	4½
I	1/2	1	1	0	1	1	1	1/2	X	1	7
J	1/2	0	1/2	1	1/2	1/2	0	0	0	X	3

Now the final rankings and points are as follows (after the ties are broken as per the criteria mentioned):

Points:

I	:	7
B	:	6
A	:	5
H	:	4.5
D	:	4.5
G	:	4
F	:	4
C	:	3.5
E	:	3.5
J	:	3

Rankings are as follows:	
1st	I
2nd	B
3rd	A
4th	H
5th	D
6th	G
7th	F
8th	E and C
9th	J

B finished second.

Choice (B)

Q6. DIRECTIONS *for questions 5 to 7:* Select the correct alternative from the given choices.

Which player had the maximum number of draws?

a) **A**

b) F

c) **J**

d) **D**

The table can be filled as follows:
In the game between A and B, A got 1/2 point or the match ended in a draw. So B also gets 1/2 point, while in the game between A and C, A got 1 point or A won the game and so C who lost the game gets zero points.
The table, when filled will be as follows:

Player	A	B	C	D	E	F	G	H	I	J	Total
A	X	1/2	1	1/2	1	0	1	0	1/2	1/2	5
B	1/2	X	1	1	0	1/2	1	1	0	1	6
C	0	0	X	1/2	1	0	1/2	1	0	1/2	$3^1/_2$
D	1/2	0	1/2	X	1/2	1	1/2	1/2	1	0	$4^1/_2$
E	0	1	0	1/2	X	1/2	1	0	0	1/2	$3^1/_2$
F	1	1/2	1	0	1/2	X	0	1/2	0	1/2	4
G	0	0	1/2	1/2	0	1	X	1	0	1	4
H	1	0	0	1/2	1	1/2	0	X	1/2	1	$4^1/_2$
I	1/2	1	1	0	1	1	1	1/2	X	1	7
J	1/2	0	1/2	1	1/2	1/2	0	0	0	X	3

Now the final rankings and points are as follows (after the ties are broken as per the criteria mentioned):

Points:

I : 7
B : 6
A : 5
H : 4.5
D : 4.5
G : 4
F : 4
C : 3.5
E : 3.5
J : 3

Rankings are as follows:	
1st	I
2nd	B
3rd	A
4th	H
5th	D
6th	G
7th	F
8th	E and C
9th	J

D had five draws, which is the maximum. Choice (D)

Q7. DIRECTIONS *for questions 5 to 7:* Select the correct alternative from the given choices.

Which of the following pairs of players are ranked the same?

a) **A and B**

b) D and H

c) **C and E**

d) **F and G**

Text Solution

The table can be filled as follows:
In the game between A and B, A got 1/2 point or the match ended in a draw. So B also gets 1/2 point, while in the game between A and C, A got 1 point or A won the game and so C who lost the game gets zero points.
The table, when filled will be as follows:

Player	A	B	C	D	E	F	G	H	I	J	Total
A	X	1/2	1	1/2	1	0	1	0	1/2	1/2	5
B	1/2	X	1	1	0	1/2	1	1	0	1	6
C	0	0	X	1/2	1	0	1/2	1	0	1/2	$3^1/_2$
D	1/2	0	1/2	X	1/2	1	1/2	1/2	1	0	$4^1/_2$
E	0	1	0	1/2	X	1/2	1	0	0	1/2	$3^1/_2$
F	1	1/2	1	0	1/2	X	0	1/2	0	1/2	4
G	0	0	1/2	1/2	0	1	X	1	0	1	4
H	1	0	0	1/2	1	1/2	0	X	1/2	1	$4^1/_2$
I	1/2	1	1	0	1	1	1	1/2	X	1	7
J	1/2	0	1/2	1	1/2	1/2	0	0	0	X	3

Now the final rankings and points are as follows (after the ties are broken as per the criteria mentioned):

Points:

I	:	7
B	:	6
A	:	5
H	:	4.5
D	:	4.5
G	:	4
F	:	4
C	:	3.5
E	:	3.5
J	:	3

Rankings are as follows:	
1st	I
2nd	B
3rd	A
4th	H
5th	D
6th	G
7th	F
8th	E and C
9th	J

Rankings of C and E are the same.

Choice (C)

Q8. DIRECTIONS *for question 8:* Type in your answer in the input box provided below the question.

How many pairs of players were awarded the same number of points

Text Solution

The table can be filled as follows:
In the game between A and B, A got 1/2 point or the match ended in a draw. So B also gets 1/2 point, while in the game between A and C, A got 1 point or A won the game and so C who lost the game gets zero points.
The table, when filled will be as follows:

Player	A	B	C	D	E	F	G	H	I	J	Total
A	X	1/2	1	1/2	1	0	1	0	1/2	1/2	5
B	1/2	X	1	1	0	1/2	1	1	0	1	6
C	0	0	X	1/2	1	0	1/2	1	0	1/2	$3^1/_2$
D	1/2	0	1/2	X	1/2	1	1/2	1/2	1	0	$4^1/_2$
E	0	1	0	1/2	X	1/2	1	0	0	1/2	$3^1/_2$
F	1	1/2	1	0	1/2	X	0	1/2	0	1/2	4
G	0	0	1/2	1/2	0	1	X	1	0	1	4
H	1	0	0	1/2	1	1/2	0	X	1/2	1	$4^1/_2$
I	1/2	1	1	0	1	1	1	1/2	X	1	7
J	1/2	0	1/2	1	1/2	1/2	0	0	0	X	3

Now the final rankings and points are as follows (after the ties are broken as per the criteria mentioned):

Points:

I : 7
B : 6
A : 5
H : 4.5
D : 4.5
G : 4
F : 4
C : 3.5
E : 3.5
J : 3

Rankings are as follows:	
1st	I
2nd	B
3rd	A
4th	H
5th	D
6th	G
7th	F
8th	E and C
9th	J

Three pairs of players – (H, D), (G, F), (C, E) – were awarded the same number of points. Ans: (3)

DIRECTIONS *for questions 9 to 12:* Answer the questions on the basis of the information given below.

Eight students, A through H, are sitting around a circular table. Each student specializes in a different subject among Chemistry, Computer Science, Ecology, Geography, Mathematics, Medicine, Physics and Sociology, not necessarily in that order. The students are ranked in the descending order of their heights with rank 1 being the tallest, and no two students are of the same height. The sum of the ranks of any two students sitting opposite each other is odd. Further it is known that,

i. the tallest student is not sitting opposite the shortest student, who, in turn, specializes in Ecology.
ii. A, whose specialization is Geography, is the fourth tallest student and he is sitting opposite the student who is the fourth shortest and whose specialization is Sociology.
iii. the students whose specializations are Chemistry and Physics are sitting adjacent to each other.
iv. B and C are sitting opposite each other and one of them specializes in Medicine, and the other, in Computer Science.
v. E is sitting two places away from A, while the student sitting opposite E specializes in Chemistry.
vi. D is sitting to the immediate right of A, while the student sitting opposite D specializes in Mathematics.
vii. there is exactly one student between F, the second shortest student, and the second tallest student.

Q9. DIRECTIONS *for questions 9 to 11:* Select the correct alternative from the given choices.

If it is known that the third tallest student is sitting adjacent to the second tallest student, then who is sitting to the immediate right of the tallest student?

a) **A**

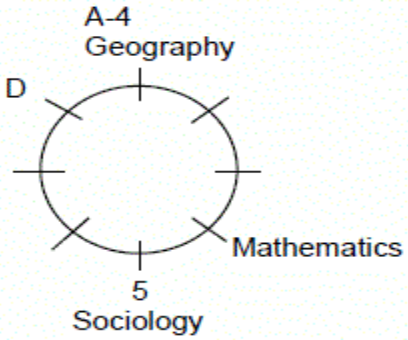
b) G

c) **E**

d) **H**

Text Solution

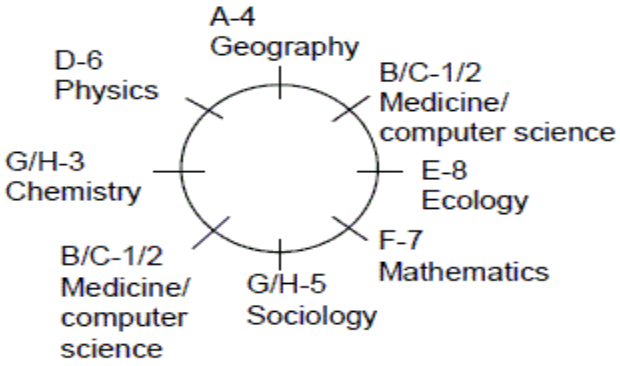
The following arrangement can be made from condition (ii) and condition (vi).



As E is two places away from A and B and C are opposite to each other, the positions B and C can take can be determined as the positions adjacent to A and adjacent to the 5th ranked person in any order.

From condition (v) and (iii), the position of E and the positions of persons specialized in Physics and Chemistry can be determined and E, should be specialized in Ecology. From condition (vii), F should be the person specialized in Mathematics and either B or C should be the second tallest person.

From condition (i) and as no student whose rank is an even number is opposite to another student, whose rank is also an even number, the student whose specialization is Chemistry should be the third tallest person and D should be the sixth tallest person. G and H are specialized in Sociology and Chemistry in any order.



From the arrangement, we can see that if the third tallest person is sitting adjacent to the second tallest person then the tallest person would be sitting between A and E.
∴ The person sitting to the immediate right of the tallest person is A.

Choice (A)

Q10. DIRECTIONS *for questions 9 to 11:* Select the correct alternative from the given choices.

If G is sitting adjacent to the student whose specialization is Medicine, then the student whose specialization is Computer Science is sitting adjacent to who among the following?

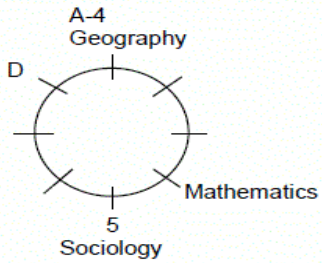
a) **H**

b) E

c) **D**

d) **F**

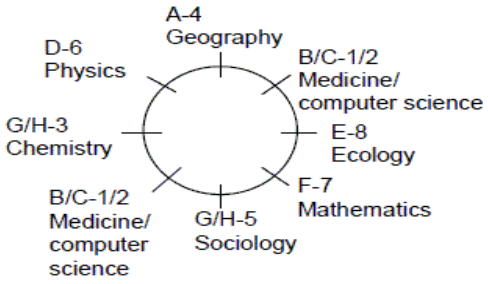
The following arrangement can be made from condition (ii) and condition (vi).



As E is two places away from A and B and C are opposite to each other, the positions B and C can take can be determined as the positions adjacent to A and adjacent to the 5th ranked person in any order.

From condition (v) and (iii), the position of E and the positions of persons specialized in Physics and Chemistry can be determined and E, should be specialized in Ecology. From condition (vii), F should be the person specialized in Mathematics and either B or C should be the second tallest person.

From condition (i) and as no student whose rank is an even number is opposite to another student, whose rank is also an even number, the student whose specialization is Chemistry should be the third tallest person and D should be the sixth tallest person. G and H are specialized in Sociology and Chemistry in any order.



From the arrangement, we can see that if G is adjacent to the student whose specialization is Medicine, then the student whose specialization is Computer Science is adjacent to A and E. Choice (B)

Q11. DIRECTIONS *for questions 9 to 11:* Select the correct alternative from the given choices.

If it is known that when the shortest student and the tallest student interchange their places, the student whose specialization is Computer Science will be sitting opposite G, who among the following specializes in Sociology?

a) **H**

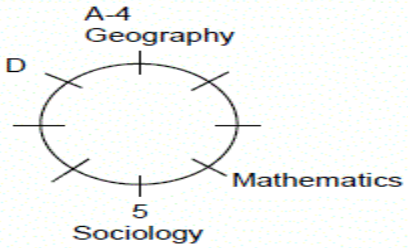
b) E

c) **D**

d) **F**

Text Solution

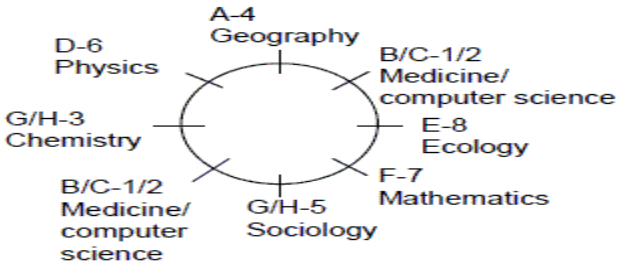
The following arrangement can be made from condition (ii) and condition (vi).



As E is two places away from A and B and C are opposite to each other, the positions B and C can take can be determined as the positions adjacent to A and adjacent to the 5th ranked person in any order.

From condition (v) and (iii), the position of E and the positions of persons specialized in Physics and Chemistry can be determined and E, should be specialized in Ecology. From condition (vii), F should be the person specialized in Mathematics and either B or C should be the second tallest person.

From condition (i) and as no student whose rank is an even number is opposite to another student, whose rank is also an even number, the student whose specialization is Chemistry should be the third tallest person and D should be the sixth tallest person. G and H are specialized in Sociology and Chemistry in any order.



As per the figure arrived at above, only G or H can specialise in Sociology. From the given choices, only H is possible.

Choice (A)

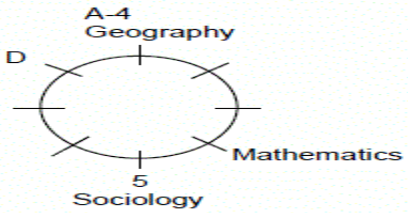
Q12. DIRECTIONS *for question 12:* Type in your answer in the input box provided below the question.

How many of the following statements are definitely true?

I. If G specializes in Sociology, then the second tallest student specializes in Computer Science.
II. If the student who specializes in Computer Science is sitting adjacent to the shortest student, then the student who specializes in Medicine is sitting adjacent to the student who specializes in Chemistry.
III. If B is the tallest student, then C is the second tallest student.
IV. If B is the second tallest student, then C specializes in Computer Science.

Text Solution

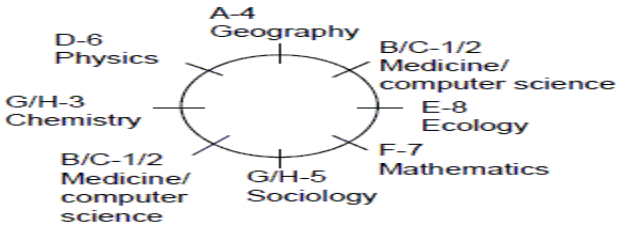
The following arrangement can be made from condition (ii) and condition (vi).



As E is two places away from A and B and C are opposite to each other, the positions B and C can take can be determined as the positions adjacent to A and adjacent to the 5th ranked person in any order.

From condition (v) and (iii), the position of E and the positions of persons specialized in Physics and Chemistry can be determined and E, should be specialized in Ecology. From condition (vii), F should be the person specialized in Mathematics and either B or C should be the second tallest person.

From condition (i) and as no student whose rank is an even number is opposite to another student, whose rank is also an even number, the student whose specialization is Chemistry should be the third tallest person and D should be the sixth tallest person. G and H are specialized in Sociology and Chemistry in any order.



The specialization of G is independent from the specialization of the second tallest person. Hence option I is not definitely true. If the person whose specialization is Computer Science is adjacent to the shortest person, then the person who is specialized in Medicine is always adjacent to the person whose specialization is Chemistry. Hence, option II is definitely true.
The height of B is dependent of the height of C. Hence, option III, is definitely true.
The specialization is not dependent on the height for B and C. Hence, option IV is not always true.
Ans: (2)

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

Table A provides data about the Wind Speed Reading and the corresponding increase in the Beaufort Number over the Beaufort Number of the immediately preceding Wind Speed Reading. Table B gives the Sea Disturbance Number and its corresponding Beaufort Number (given in parentheses) and the associated Average Wave Height. Table C gives the observable wind characteristics, i.e., the common name assigned to the wind, for the corresponding Beaufort Number.

Table A

Wind Speed Reading (in Km/Hr)	Increase in Beaufort Number *
1 – 5	1
6 – 11	1
12 – 19	2
20 – 38	1
39 – 49	3
50 – 61	2
62 – 74	3
75 – 88	3
89 – 102	2
> 102	1

Table B

Sea Disturbance Number (Beaufort Number)	Average Wave Height
0 (0)	0
0 (1)	0.1
1 (2)	0.3
2 (4)	0.4
3 (5)	0.6
4 (8)	1.2
5 (10)	2.4
6 (13)	4
7 (16)	6
8 (18)	9

Table C

Beaufort Number	Wind Name
0	Calm
1	Light Air
2	Light Breeze
4	Gentle Breeze
5	Moderate
8	Fresh
10	Strong
13	Gale
16	Storm
18 or more	Hurricane

*Beaufort Number is 0 for Wind Speed Reading of less than 1 km/hr and for all wind speeds in excess of 1 km/hr, the Beaufort Number is calculated over that of the immediate preceding wind speed reading.

Q13. DIRECTIONS *for questions 13 to 15:* Select the correct alternative from the given choices.

What is the range over which the Average Wave Height can vary when the wind speed reading varies between 20 and 74 km/hr?

a) **0.3 – 2.4**

b) 0.1 – 6

c) **0.6 – 4**

d) **Data inadequate**

Text Solution

Here an accurate interpretation of Table A would enable one to solve entire set very easily.

The Beaufort number is 0 when wind speed is less than 1 km/hr. Now let us construct a table for Beaufort numbers with the corresponding wind speed reading (i.e. cumulative of the column reading given in the second column of table A).

Wind Speed Reading	Beaufort Number
1-5	1
6-11	2
12-19	4
20-38	5
39-49	8
50-61	10
62-74	13
75-88	16
89-102	18
>102	19

Now we can answer the given questions.

When the Wind Speed Reading is 20 the Beaufort Number is 5. The corresponding Sea Disturbance Number is 3 for which the average wave height is 0.6. When the Wind Speed Reading is 74. The Beaufort Number is 13 for which the average wave height is 4.

$\therefore$ The average wave height range is 0.6 – 4. Choice (C)

Q14. DIRECTIONS *for questions 13 to 15:* Select the correct alternative from the given choices.

Which of the following is not a possible Wind Speed Reading (in km/hr) when the wind is either Light Breeze, Gentle Breeze, Moderate, Fresh or Strong?

a) **60**

b) 42

c) **32**

d) **72**

Text Solution

Here an accurate interpretation of Table A would enable one to solve entire set very easily.

The Beaufort number is 0 when wind speed is less than 1 km/hr. Now let us construct a table for Beaufort numbers with the corresponding wind speed reading (i.e. cumulative of the column reading given in the second column of table A).

Wind Speed Reading	Beaufort Number
1-5	1
6-11	2
12-19	4
20-38	5
39-49	8
50-61	10
62-74	13
75-88	16
89-102	18
>102	19

Now we can answer the given questions.

When the wind is either Light Breeze, Gentle, Moderate, Fresh or Strong the Beaufort numbers are 2, 4, 5, 8 or 10. The corresponding wind speeds for those Beaufort numbers are in the range of 6 – 61.
∴72 is not a possible Wind Speed Reading. Choice (D)

Q15. DIRECTIONS *for questions 13 to 15:* Select the correct alternative from the given choices.

The coast guard of Bangladesh raises cautionary signal 1 for a Storm, 2 for a Gale and 3 for a Hurricane in times of inclement weather. On 5th June 2003, the wind speeds at Coastal Bangladesh were in excess of 94 km/hr. Which of the following is true regarding the cautionary signal raised?

a) **The signal raised was 1.**

b) The signal raised was 2.

c) **The signal raised was 3.**

d) **Either signal 1 or signal 2.** Text Solution

Here an accurate interpretation of Table A would enable one to solve entire set very easily.

The Beaufort number is 0 when wind speed is less than 1 km/hr. Now let us construct a table for Beaufort numbers with the corresponding wind speed reading (i.e. cumulative of the column reading given in the second column of table A).

Wind Speed Reading	Beaufort Number
1-5	1
6-11	2
12-19	4
20-38	5
39-49	8
50-61	10
62-74	13
75-88	16
89-102	18
>102	19

Now we can answer the given questions.

When the wind speeds are in excess of 94 km/hr the corresponding Beaufort Number is 18 or 19. The wind type for Beaufort Number 18 or more is Hurricane and in times of a Hurricane the coast guard of Bangladesh raises cautionary signal 3. Choice (C)

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

What is the increase in the Sea Disturbance Number when the Wind Speed Reading has increased from 17 km/hr to 83 km/hr? Text Solution

Here an accurate interpretation of Table A would enable one to solve entire set very easily.

The Beaufort number is 0 when wind speed is less than 1 km/hr. Now let us construct a table for Beaufort numbers with the corresponding wind speed reading (i.e. cumulative of the column reading given in the second column of table A).

Wind Speed Reading	Beaufort Number
1-5	1
6-11	2
12-19	4
20-38	5
39-49	8
50-61	10
62-74	13
75-88	16
89-102	18
>102	19

Now we can answer the given questions.

When the Wind Speed Reading is 17 km/hr. The corresponding Beaufort Number is 4. The corresponding Sea Disturbance Number for this reading is 2. When the Wind Speed Reading is 83 km/hr the Beaufort Number is 16. For this Beaufort reading the corresponding Sea Disturbance Number is 7.
∴ The increase is Sea Disturbance Number is 5. Ans: (5)

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

Christopher was scheduled to meet four friends – Kareena, Jiya, Bipasha and Mary – on the same day, at a clubhouse. He made sure that each of his friends were to meet him at a different location inside the clubhouse and at a different time.

i. The friend whom he met at the lawns, and Jiya were the last and the first friends he met respectively.
ii. Mary was not the friend he met at the pattiserie and she was not the last friend he met.
iii. He met Bipasha after he met Kareena.
iv. He met exactly one friend in between meeting Bipasha and meeting the friend at the pattiserie, not necessarily in the same order.

v. He met the friend at the bar before meeting the friend at the library.

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

Whom did Christopher meet at the library?

a) **Mary**

b) Jiya

c) **Kareena**

d) **Bipasha**

Text Solution

(i) Jiya ≠ Lawns
Jiya = 1st person met by Christopher
Person met at the lawns is the 4th person met by Christopher.

(ii) Mary ≠ Pattiserie
Mary is not the last person that Christopher met.

(iii) Christopher met Bipasha after Kareena.

(iv) As neither Kareena nor Mary can be the last person Christopher met, Bipasha must be the last person met by Christopher. Kareena must be the 2nd person he must have met and they must have met at the pattiserie.

(v) Christopher meets the person at the bar before meeting the person at the library.

From the above information, the following can be deduced.

Order of meeting Christopher	Name	Location
1	Jiya	Bar
2	Kareena	Pattiserie
3	Mary	Library
4	Bipasha	Lawns

At the library, Christopher met Mary. Choice (A)

Q18. DIRECTIONS *for questions 17 to 20:* Select the correct alternative from the given choices.

At which of the following locations did Christopher meet a friend immediately before meeting the friend at the lawns?

a) **Pattiserie**

b) Bar

c) **Library**

d) **Either Pattiserie or Library** Text Solution

(i) Jiya ≠ Lawns
Jiya = 1st person met by Christopher
Person met at the lawns is the 4th person met by Christopher.

(ii) Mary ≠ Pattiserie
Mary is not the last person that Christopher met.

(iii) Christopher met Bipasha after Kareena.

(iv) As neither Kareena nor Mary can be the last person Christopher met, Bipasha must be the last person met by Christopher. Kareena must be the 2nd person he must have met and they must have met at the pattiserie.

(v) Christopher meets the person at the bar before meeting the person at the library.
From the above information, the following can be deduced.

Order of meeting Christopher	Name	Location
1	Jiya	Bar
2	Kareena	Pattiserie
3	Mary	Library
4	Bipasha	Lawns

At the library. Choice (C)

Q19. DIRECTIONS *for questions 17 to 20:* Select the correct alternative from the given choices.

Whom did Christopher meet immediately before he met Bipasha?

a) **Jiya**

b) Kareena

c) **Mary**

d) **Cannot be determined** Text Solution

(i) Jiya ≠ Lawns
Jiya = 1st person met by Christopher
Person met at the lawns is the 4th person met by Christopher.

(ii) Mary ≠ Pattiserie
Mary is not the last person that Christopher met.

(iii) Christopher met Bipasha after Kareena.

(iv) As neither Kareena nor Mary can be the last person Christopher met, Bipasha must be the last person met by Christopher. Kareena must be the 2nd person he must have met and they must have met at the pattiserie.

(v) Christopher meets the person at the bar before meeting the person at the library.
From the above information, the following can be deduced.

Order of meeting Christopher	Name	Location
1	Jiya	Bar
2	Kareena	Pattiserie
3	Mary	Library
4	Bipasha	Lawns

Christopher met Mary immediately before he met Bipasha. Choice (C)

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

Which of the following statements is definitely true?

a) **Christopher met Jiya at the pattiserie.**

b) Christopher met exactly two friends before he met Bipasha.

c) **Christopher met Mary immediately after he met Jiya.**

d) **Christopher met Kareena before he met Mary.**

Text Solution

(i) Jiya ≠ Lawns
Jiya = 1st person met by Christopher
Person met at the lawns is the 4th person met by Christopher.

(ii) Mary ≠ Pattiserie
Mary is not the last person that Christopher met.

(iii) Christopher met Bipasha after Kareena.

(iv) As neither Kareena nor Mary can be the last person Christopher met, Bipasha must be the last person met by Christopher. Kareena must be the 2nd person he must have met and they must have met at the pattiserie.

(v) Christopher meets the person at the bar before meeting the person at the library.

From the above information, the following can be deduced.

Order of meeting Christopher	Name	Location
1	Jiya	Bar
2	Kareena	Pattiserie
3	Mary	Library
4	Bipasha	Lawns

The statement given in Choice (D) is definitely true. Choice (D)

DIRECTIONS *for questions 21 to 24:* Answer the questions on the basis of the information given below.

The following tables give information about the number of copies sold as well as the readership factor of five magazines.

Number of Copies Sold

Magazine \ Year	2007	2008	2009	2010	2011
LF	1,86,300	1,95,000	2,48,000	2,25,000	2,65,000
SS	1,38,400	1,46,000	2,50,000	1,78,000	2,22,400
BL	1,65,600	1,68,000	2,25,000	1,76,000	2,85,500
TI	1,78,200	1,65,000	2,62,000	1,84,000	2,36,000
ND	1,93,500	2,10,000	2,45,000	2,20,000	3,25,000

Readership factor

Magazine \ Year	2007	2008	2009	2010	2011
LF	4	4	3.5	6	5
SS	4.2	4.5	2	5	4.5
BL	3.5	5.5	2.5	3	5.5
TI	6.2	6	4.2	4.5	4.5
ND	3.2	5.2	3.5	3.5	4

Note:

i. The Readership Factor of a magazine is the average number of people reading a copy of the magazine.
ii. For any magazine, Total Number of Readers = No. of Copies Sold × Readership Factor

Q21. DIRECTIONS *for questions 21 and 22:* Select the correct alternative from the given choices.

Which magazine had the highest number of readers in the year 2011?

a) **LF**

b) ND

c) **TI**

d) **BL**

Text Solution

In 2011, BL had the highest number of readers. Choice (D)

Q22. DIRECTIONS *for questions 21 and 22:* Select the correct alternative from the given choices.

Which magazine has shown the highest percentage increase in the number of readers from 2007 to 2011 ?

a) **LF**

b) SS

c) **BL**

d) **ND**

Text Solution

From the second table, we can see that the highest percentage increase in readership factor is for BL — (1)
The number of copies sold of BL is less than the number of copies sold of both LF and TI in 2007 and the same is more for BL in 2011 ———— (2)
Form (1) and (2) the percentage increase in readers of BL is more than that of LF and TI
The percentage increase in readership factor and number of copies sold of SS, BL and BD are as follows.

Magazine	% change in Readership Factor	% change in No. of Copies Sold
SS	$\frac{4.5}{4.2} - 1 = 7.14\%$	$\left(\frac{2224}{1384}\right) - 1 = 60.7\%$
BL	(5.5/3.5) – 1 = 57.14%	(2855 / 1656) – 1 = 72.40%
ND	(4/3.2) – 1 = 25%	(3250 /1935) – 1 = 67.95%

From the table we can see than BL has the highest percentage increase in both readership factor and number of copies sold
⇒ BL has the highest percentage increase in the number of readers.

Choice (C)

Q23. DIRECTIONS *for questions 23 and 24:* Type in your answer in the input box provided below the question.

Every year, a company places its advertisements in exactly one of the five magazines mentioned above. If each year, the company chooses that magazine which had the highest number of readers in the previous year, in how many different magazines did the company advertise from 2008 to 2012?

Text Solution

By observation in 2007, the product of readership factor and number of copies sold is the highest for TI
Similarly, the product will be highest for either TI or ND in 2008
$165 \times 6 = 990$ and $210 \times 5.2 = 1092$. Thus, the number of readers is the highest for ND in 2008.
By observation, the product is the highest for TI in 2009, and for LF in 2010
In 2011, the product will be the highest for either BL or ND
$2855 \times 5.5 = 15702.5$ and $3250 \times 4 = 13000$. Thus the readers is highest for BL in 2011.
Hence, the company advertises in TI, ND, TI, LF and BL in 2008, 2009, 2010, 2011 and 2012 respectively $\Rightarrow$ the company places its advertisements in four different magazines
Ans: (4)

Q24. DIRECTIONS *for questions 23 and 24:* Type in your answer in the input box provided below the question.

If the revenue received from the sale of magazines is the only source of revenue for each of the magazines and if the selling prices of the magazines LF, SS, BL, TI, ND, in each of the given years, are in the ratio of 11 : 12 : 13 : 14 : 15 respectively, then what is the maximum number of years for which any magazine had the highest revenue per reader during given period?

Text Solution

As the readership factor gives the number of persons reading a copy, price / readership factor gives the revenue per reader. Given, the selling price of the magazines are in the ratio 11 : 12 : 13 : 14 : 15 the revenue per reader in 2007 will be highest for that magazine for which has the highest ratio among $\frac{11}{4}, \frac{12}{4.2}, \frac{13}{3.5}, \frac{14}{6.2}$ and $\frac{15}{3.2}$. By observation, it must be ND. Similarly, in year 2011 ND will be the highest.

Now, checking for 2008, will give that among $\frac{11}{4}, \frac{12}{4.5}, \frac{13}{5.5}, \frac{14}{6}$ and $\frac{15}{5.2}$, we see that $\frac{15}{5.2}$, i.e., ND is highest. Similarly, for 2009 and 2010 we get SS and BL respectively.
Hence, ND was the highest for the maximum number of years, i.e., 3 years.
Ans: (3)

DIRECTIONS *for questions 25 to 28:* Answer the questions on the basis of the information given below.

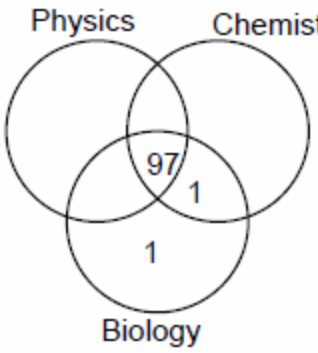
At an International School, each of the students in Class XII has to opt for at least one of the three subjects, Physics, Chemistry or Biology. It is also known that, the number of students who opted for Physics is less than the number of students who opted for Chemistry, which, in turn, is less than the number of students who opted for Biology.

Q25. DIRECTIONS *for questions 25 to 28:* Type in your answer in the input box provided below the question.

If 97 students opted for Physics, the total number of students is at least

Text Solution

As the number of students who study Physics is the least and it is given to be 97, the minimum total number of students is 99 as shown below.



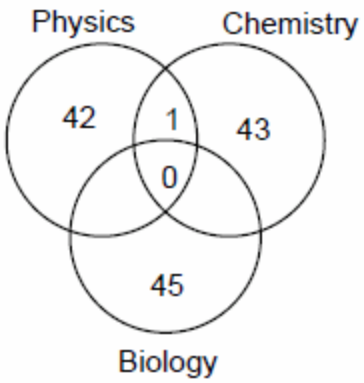
Ans: (99)

Q26. DIRECTIONS *for questions 25 to 28:* Type in your answer in the input box provided below the question.

If 45 students opted for Biology and it is known that the number of students who opted for exactly one, exactly two, and exactly three subjects are all different and also the number of students who opted for only Physics, only Chemistry and only Biology are all different, then the total number of students is at most

Text Solution

As the maximum number of students study biology, the maximum total number of students can be 45 + 42 + 43 + 1 = 131 as shown below.



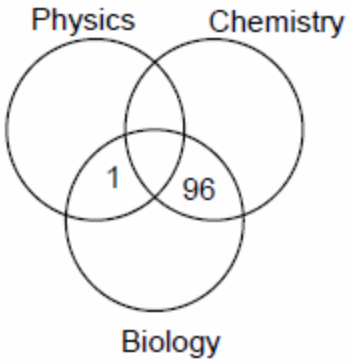
Ans: (131)

Q27. DIRECTIONS *for questions 25 to 28:* Type in your answer in the input box provided below the question.

If it is now made mandatory that each student opt for at least two of the three given subjects, and 96 students opted for Chemistry, then the total number of students is at least

Text Solution

The minimum total number of students is 97, which is as given below.



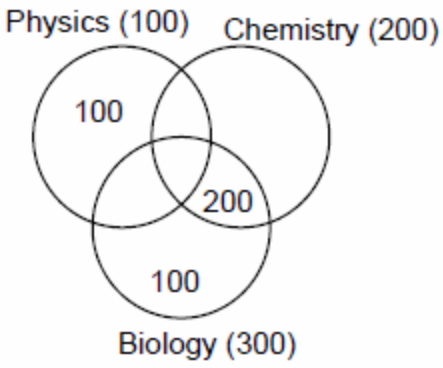
Ans: (97)

Q28. DIRECTIONS *for questions 25 to 28:* Type in your answer in the input box provided below the question.

100 students opted for Physics, 200 students opted for Chemistry 300 students opted for Biology. If the maximum possible number of students opted for only Chemistry and Biology, then the total number of student is at most

Text Solution

The maximum possible number of students who could have opted for only Chemistry and Biology is 200.
The number of students can be at most 400 as shown below.



Ans: (400)

DIRECTIONS *for questions 29 to 32:* Answer the questions on the basis of the information given below.

Company ABC has business across the country in only Cement, Construction and IT sectors. The growth in the total sales and the growth in the sales of the company in each of the three sectors, in the year 2009, when compared to the previous year, in five major states, where the company operates, are given in the table below. The total growth in the sales of the company in any state is the weighted average of the growth in the sales of the company in each of the three sectors in that state.

Percentage growth in sales of company ABC

(all figures in percentage terms)

State	A.P.	U.P.	M.P.	T.N.	W.B.
Total Sales	**10.2**	**15.6**	**12.2**	**3.5**	**9.8**
Cement	14.0	18.1	10.8	4.2	8.4
Construction	8.5	13.5	8.2	3.2	10.8
IT	5.2	10.3	15.5	3.0	8.8

Q29. DIRECTIONS *for questions 29 to 32:* Select the correct alternative from the given choices.

In the year 2008, the cement business of company ABC in the state A.P. contributed at least what percentage (approximately) of the total sales of the company in that state?

a) **21%**

b) 31%

c) **41%**

d) **61%**

Text Solution

To find the minimum percentage contribution of the cement business, we have to assume maximum contribution from the other two businesses. So assume weightage of IT business is negligible compared to construction and total growth in construction and IT businesses is approximately equal to 8.5.

Then $\frac{8.5\,(100-x)+14x}{100} = 10.2 \Rightarrow x \cong 30.9\%$ Choice (B)

Q30. DIRECTIONS *for questions 29 to 32:* Select the correct alternative from the given choices.

In the year 2008, if the total sales of company ABC in the state M.P. were Rs.2500 crore, what were the maximum possible sales (approximately) of the IT business in that state?

a) **Rs.1110 crore**

b) Rs.1250 crore

c) **Rs.1370 crore**

d) **Rs.1480 crore**

Text Solution

In 2008, let us find the maximum possible percentage contribution of the IT business. For this we have to assume IT business contributed the maximum and the other sectors contributed the minimum. So we assume the contribution of the cement business to be negligible compared to that of the construction business and contribution of cement and construction businesses together is nearly 8.2%.

Then $\frac{15.5x + 8.2(100-x)}{100} = 12.2$

$\Rightarrow x \cong 54\%$ and 54% of ₹2500 crore ≅ ₹1370 crore. Choice (C)

Q31. DIRECTIONS *for questions 29 to 32:* Select the correct alternative from the given choices.

Which of the following can be concluded about the individual sales of the three businesses of company ABC in the state of W.B. for the year 2008?

a) **Cement business had the maximum sales.**

b) Construction business had the maximum sales.

c) **IT business had the maximum sales.**

d) **Construction business had the minimum sales.**

Text Solution

Since the total sales growth is 9.8% and that of Cement and IT are 8.4% and 8.8% respectively, the total sales growth of Cement and IT businesses would be less than 8.8% and so construction business, which grew by 10.8% would have definitely contributed more than 50%, since only then can the overall growth will be 9.8%.

Choice (B)

Q32. DIRECTIONS *for questions 29 to 32:* Select the correct alternative from the given choices.

In the year 2009, the cement business of company ABC in the state U.P. contributed at most what percentage of the total sales of the company in that state (approximately)?

a) **54%**

b) 78%

c) **60%**

d) **70%**

To find the maximum percentage contribution of the cement business, we have to assume minimum contribution from the other two businesses. So assume the weightage of construction business negligible compared to that of IT business and the contribution of construction and IT together is nearly 10.3%.

Then, $\frac{18.1a + 10.3b}{a+b} = 15.6 \Rightarrow 2.5a = 5.3b$

$\Rightarrow \frac{a}{b} = \frac{5.3}{2.5} = \frac{53}{25}$

$\therefore \frac{1.181a}{(a+b)1.156} = \frac{(1.181)\frac{a}{b}}{\left(\frac{a}{b}+1\right)(1.56)} \times 100$

$= \frac{1.181 \times \frac{53}{25}}{\left(\frac{53}{25}+1\right)(1.156)} \times 100 = \frac{1.181 \times 53}{78 \times 1.156} \times 100 \cong 70\%$

Choice (D)

QUANT

Q1. DIRECTIONS *for question 1:* Select the correct alternative from the given choices.

A shopkeeper had 15 cartons of pencil boxes with him and each carton had 120 pencil boxes, with each pencil box having 15 pencils. If the shopkeeper was able to sell only 10% of the pencils present in 15% of the pencil boxes in 20% of the cartons that he had, how many pencils was the shopkeeper able to sell?

a) **81**

b) 99

c) **72**

d) **78**

Text Solution

20% of the cartons = 3 cartons
10% of pencil boxes in 3 cartons = 10% × 3 × 120 = 54
10% of the pencils in 54 pencil boxes = 81 Choice (A)

Q2. DIRECTIONS *for question 2:* Type in your answer in the input box provided below the question.

If $f(x) = -2x^2 - 2|x|$ and $g(x) = 3x^2 - 3|x|$, at how many points in the coordinate plane will *f(x)* and *g(x)* intersect?

Text Solution

Since $f(x) = g(x)$

$-2x^2 - 2|x| = 3x^2 - 3|x|$

$\Rightarrow 5x^2 = |x|$

$\therefore$ x can be 0 or 1/5 or –1/5.
Hence, x can assume three values, i.e., *f(x)* and *g(x)* will intersect at three points.
Ans: (3)

Q3. DIRECTIONS *for questions 3 to 7:* Select the correct alternative from the given choices.

What is the remainder when $28! + 27^{28}$ is divided by 29?

a) **0**

b) 13

c) **2**

d) **28**

Text Solution

From Wilson's theorem, $(29 - 1)! + 1$ is divisible by 29.
From Fermat's little theorem, $(27^{(29-1)} - 1)$ is divisible by 29.
Hence, $(29-1)! + 27^{28}$ is divisible by 29. Therefore, the required remainder will be 0.
Choice (A)

Q4. DIRECTIONS *for questions 3 to 7:* Select the correct alternative from the given choices.

From five positive integers, every possible combination of three numbers is selected and the total of the three numbers is found. If the ten possible sums are 30, 33, 34, 35, 36, 37, 38, 40, 41 and 42, find the sum of the least and the greatest of the five numbers.

a) **25**

b) 26

c) **27**

d) **Cannot be determined** **Text Solution**

Each of the 5 numbers occurs in 6 triplets (∵ Of the remaining 4 numbers, 2 can be selected in $^4C_2$ or 6 ways).
∴ The sum of the 10 given sums is 6 times the sum of the 5 numbers.
∴ 6 times the sum of the 5 numbers is 30 + (33 + 34 + 35 + 36 + 37 + 38) + (40 + 41 + 42) = 366, or the sum of the five numbers is 61.
∴ The sum of the 10 pairs that can be formed are (61 – 42), (61 – 41) etc., i.e., 19, 20, 21, 23, 24, 25, 26, 27, 28 and 31.
Let the 5 numbers be a, b, c, d and e where $a < b < c < d < e$.
∴ $a + b = 19 \rightarrow (1)$ and $c + e = 28 \rightarrow (2)$
$a + c = 20 \rightarrow (3)$ $d + e = 31 \rightarrow (4)$
also $a + b + c + d + e = 61 \rightarrow (5)$
(5) – (1) – (2) gives $d = 14$
⇒ from (4), $e = 17$
Also, (5) – (3) – (4) gives $b = 10$
⇒ from (1), $a = 9$
Hence $a + e = 17 + 9 = 26$.

Alternative Solution:

As $a < b < c < d < e$, among the triplets, the least is $a + b + c$ and the second least is $a + b + d$. Similarly, the greatest is $a + d + e$ and the second is $b + d + e$.
∴ $a + b + c = 30$ ------- (1) and $b + d + e = 41$ ------- (3)
$a + b + d = 33$ ------- (2) $c + d + e = 42$ ------- (4)
Adding all the triplets, we get $6(a + b + c + d + e) = 366$ or $a + b + c + d + e = 61$ --- (5)
(5), (1) ⇒ $d + e = 31$.
∴ From (4), $c = 11$ and from (3), $b = 10$
∴ From (1), $a = 9$. From (2), $d = 14$ and finally $e = 17$
∴ $a + e = 9 + 17 = 26$. Choice (B)

Q5. DIRECTIONS *for questions 3 to 7:* Select the correct alternative from the given choices.

In an airport, a plane is scheduled to take off every 35 minutes, starting from 8:00 AM, and a plane is scheduled to land every 20 minutes, starting from 8:05 AM. Whenever a take-off and a landing are going to occur at the same time, the ground control will delay the plane that is about to land by three minutes, while all the subsequent planes will take-off/land on schedule. How many planes that are scheduled to land between 8:00 AM and 9:30 PM will get delayed?

a) **5**

b) 3

c) **2**

d) **6**

Text Solution

The planes land after 0, 35, 70, 105… (35×n) minutes from 8:00 AM.
The planes take off after 5, 25, 45, 65… (20k + 5) minutes from 8:00 AM.
The instances when a landing and a take off can occur at the same time will be first at 105 (35 × 3, 20 × 5 + 5) and then, after every 140 minutes.
The number of minutes between 8:00 AM and 9:30PM
= 810 minutes.
Hence, the planes will get delayed at 105 min, 245 min, 385 min, 525 min, 665 min and 805 min. Hence, a total of 6 planes will get delayed. Choice (D)

Q6. DIRECTIONS *for questions 3 to 7:* Select the correct alternative from the given choices.

If $x = 2 + 2^{2/3} + 2^{1/3}$, then which of the following is true?

a) $\mathbf{2x^3 - 2x^2 + 6x + 3 = 0}$

b) $6x^3 + x^2 - 12x + 6 = 0$

c) $\mathbf{x^3 - 6x^2 + 6x - 2 = 0}$

d) $\mathbf{x^3 - 12x^2 + x - 4 = 0}$

Text Solution

$x = 2 + 2^{2/3} + 2^{1/3}$
$x - 2 = 2^{2/3} + 2^{1/3}$
Cubing both sides, $x^3 - 8 - 6x^2 + 12x$
$= 2^2 + 2 + 3.2^{2/3} \cdot 2^{1/3}(2^{2/3} + 2^{1/3}) = 6 + 6(x - 2)$
$\Rightarrow x^3 - 6x^2 + 6x - 2 = 0$

Alternative solution:

Approximate value of x = 2 + 1.6 + 1.3 = 4.9.
Upon inspection, only option C satisfies. One may also use the calculator to arrive at this value. Choice (C)

Q7. DIRECTIONS *for questions 3 to 7:* Select the correct alternative from the given choices.

What is the number of integral values of x which satisfy both the inequalities $8x^2 + 6x - 27 < 0$ and $-x^2 + 11x + 80 > 0$?

a) **1**

b) 3

c) **2**

d) **4** **Text Solution**

$8x^2 + 6x - 27 < 0$ can be written as $\left(x - \frac{3}{2}\right)\left(x + \frac{9}{4}\right) < 0$

$\Rightarrow x < \frac{3}{2}$ *and* $x > -\frac{9}{4}$

$-x^2 + 11x + 80 > 0$ can be written as $(16 - x)(x + 5) > 0$

$\Rightarrow x < 16$ and $x > -5$

Hence, x can assume only four integral values: -2, -1, 0 and 1. Choice (D)

Q8. DIRECTIONS *for question 8:* Type in your answer in the input box provided below the question.

Find the sum of all positive even numbers less than 300 which are not divisible by 7.

Text Solution

Sum of all positive even numbers less than 300

$= \frac{n}{2}(a+1) = \frac{149}{2} * (2 + 298) = 22{,}350$

The highest multiple of 7 less than 300 = 7×42 = 294

Therefore, we need to subtract all the even multiples of 7 lower than this value.

Required value = $22350 - (7 \times 2 + 7 \times 4 + 7 \times 6 ... + 7 \times 42)$

$= 22350 - 7 \times (2 + 4 + 6 + 8 ... + 42)$

$22350 - 7 \times \frac{21}{2} \times 44 = 22350 - 3234 = 19116$ Ans: (19116)

Q9. DIRECTIONS *for questions 9 and 10:* Select the correct alternative from the given choices.

Two vessels, A and B, contain a mixture of kerosene and petrol in the ratio 4 : 3 and 8 : 11 respectively. If the contents of A and B are mixed, which of the following cannot be the ratio of kerosene and petrol in the mixture thus formed?

a) **13 : 17**

b) 11 : 9

c) **10 : 7**

d) **7 : 9**

Text Solution

Percentage of Kerosene in vessel A = $\frac{4}{7} \times 100 = 57.14\%$

Percentage of Kerosene in vessel B = $\frac{8}{19} \times 100 = 42.1\%$

Any mixture formed from these mixtures will always have Kerosene in the range 42.1% to 57.14%.

Considering the choices given, the percentage of kerosene in

Choice (A) = $\frac{13}{30} \times 100 \cong 43.3\%$

Choice (B) = $\frac{11}{20} \times 100 = 55\%$

Choice (C) = $\frac{10}{17} \times 100 \cong 58.8\%$

Choice (D) = $\frac{7}{16} \times 100 = 43.75\%$

The ratio given in Choice(C) is not possible. Choice (C)

Q10. DIRECTIONS *for questions 9 and 10:* Select the correct alternative from the given choices.

How many triplets of prime numbers can be formed such that the terms of the triplet are in arithmetic progression?

a) **1**

b) 2

c) **3**

d) **More than 3**

Text Solution

Some of the triplets of prime numbers in which the terms are in arithmetic progression are 3, 5, 7; 3, 7, 11; 3, 11, 19; 3, 13, 23 etc. Choice (D)

Q11. DIRECTIONS *for question 11:* Type in your answer in the input box provided below the question.

What are the last two digits of $849^{23} + 521^{63}$?**Text Solution**

The last two digits of powers of 49 will be 49, 01, 49, 01…
Hence, the last two digits of 849^{23} will be 49.
The last two digits of powers of 21 will be 21, 41, 61, 81, 01, 21…
Hence, the last two digits of 521^{63} will be 61.
The last two digits of the sum will be 49 + 61 = 110 ≡ 10 Ans: (10)

Q12. DIRECTIONS *for question 12:* Select the correct alternative from the given choices.

How many four-letter words can be formed by using the letters of the word PROPORTION, such that all the four letters are distinct?

a) **720**

b) 60

c) **180**

d) **360**

Text Solution

Number of distinct letters in the word PROPORTION = 6

Number of 4 letter words that can be formed $= \frac{6!}{2!} = 360$ Choice (D)

Q13. DIRECTIONS *for question 13:* Type in your answer in the input box provided below the question.

Ravi borrowed Rs.10000 from a bank at a simple interest of 10% per annum. If Ravi repaid his loan in five equal yearly instalments, paying each instalment at the end of the respective year, how much (in Rs.) did Ravi pay each year?

Text Solution

When a loan is recovered in n equal yearly instalments, then the instalment amount is set to ensure that the sum of the principal and the interest earned on it for n years is equal to the sum of the instalments and the respective interests earned on them over the rest of the repayment period.
Let each instalment be ₹x.
The future value of 10000 at the end of 5 years

$= (10000) + \left(5 \times 10000 \times \frac{10}{100}\right) = 15000$

This must be equal to the future value of all the instalments paid, at the end of 5 years.

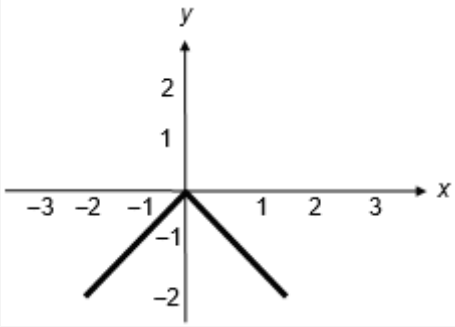
$\Rightarrow 15000 = \left(x + 4x \times \frac{10}{100}\right) + \left(x + 3x \times \frac{10}{100}\right) +$

$\left(x + 2x \times \frac{10}{100}\right) + \left(x + x \times \frac{10}{100}\right) + x$

Solving, we get $x = 2500$. Ans: (2500)

Q14. DIRECTIONS *for questions 14 to 18:* Select the correct alternative from the given choices.

The graph below gives a function $f(x)$, represented by thickened line segments. From among the choices given, choose the function that best describes $f(x)$.



a) $f(x) = -f(-x)$

b) $f(x) = f(-x)$

c) $f(x) = f(-x) + 2$

d) $f(x) = 1 - f(-x)$

Text Solution

The graph can be understood as a function involving modulus $f(x) = -|x|$
Now $f(-x) = -|-x| = -|x|$
Thus, $f(x) = f(-x)$.
Alternatively, since the graph is symmetric about the y-axis, $f(x)$ will be equal to $f(-x)$ Choice (B)

Q15. DIRECTIONS *for questions 14 to 18:* Select the correct alternative from the given choices.

Find the area of the quadrilateral whose vertices are (4, 0), (5, 6), (10, 6) and (12, 0) respectively.

a) **39 sq. units**

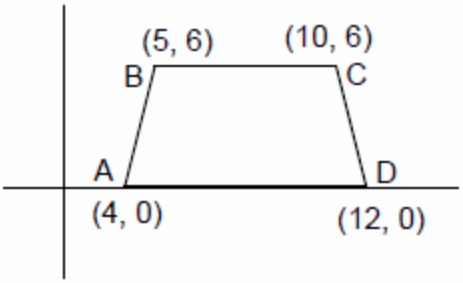
b) **52 sq. units**

c) **65 sq. units**

d) **78 sq. units**

Text Solution

Let the quadrilateral be ABCD, where A = (4, 0), B = (5, 6), C = (10, 6) and D = (12, 0).
By observation AD is parallel to BC.



We can see that the given quadrilateral is a trapezium, with the lengths of the parallel sides being 8 units and 5 units and the distance between the parallel sides being 6 units.
Hence, the area of the trapezium

$= \frac{1}{2} \times 13 \times 6 = 39$ *sq.units*. Choice (A)

Q16. DIRECTIONS *for questions 14 to 18:* Select the correct alternative from the given choices.

What is the area of the circumcircle of a right angled triangle whose base is 5 cm and height, 12 cm?

a) **42.25π sq.cm.**

b) **144π sq.cm.**

c) **169π sq.cm.**

d) **84.5π sq.cm.**

Text Solution

The diameter of the circumcircle will be the hypotenuse of the triangle.
Hypotenuse = 13 cm
Area of the circumcircle = π × 169/4 = 42.25π sq.cm. Choice (A)

Q17. DIRECTIONS *for questions 14 to 18:* Select the correct alternative from the given choices.

The LCM of two distinct prime numbers *a* and *b* is divisible by *c*, which is greater than both *a* and *b*. What is the value of *c*?

a) ***a* + *b***

b) ***ab***

c) ***a* + 2*b***

d) **Cannot be determined**

Text Solution

The LCM of two prime numbers a and b will be ab. If ab is divisible by c, then c has to be either 1 or a or b or ab. Since c is greater than a and b, c cannot be 1 or a or b. Hence, c = ab. Choice (B)

Q18. DIRECTIONS *for questions 14 to 18:* Select the correct alternative from the given choices.

If *x* and *y* are positive and $x^6y^4 = 1024$, find the minimum value of $12x + 8y$.

a) **32**

b) **40**

c) **44**

d) **20**

Text Solution

When the product of two or more positive quantities is constant, then the sum of all the quantities will be the least when they are all equal to each other.
Now, if $x^6 . y^4 = 1024$,
then (x) (x) (x) (x) (x) (x) (y) (y) (y) (y) = 1024,
[(x + x + x + x + x + x) + (y + y + y + y)] will be the least when all the ten quantities (i.e. 6x's and 4y's) are equal, to say 'k'.
Hence $k^{10} = 1024 = 2^{10}$
$\Rightarrow k = 2$
$\therefore$ minimum value of 6x + 4y = 10k = 20.
Hence, the minimum value of 12x + 8y = 20k = 40
[$\because$ 12x + 8y = 2 (6x + 4y)]. Choice (B)

Alternative Solution:

Given $x^6y^4 = 1024$. If x^my^n is a constant, the minimum value of $ax + by$ is realized when

$$\frac{ax}{m} = \frac{by}{n}$$

i.e., when $\frac{12x}{6} = \frac{8y}{4} \Rightarrow x = y$

Hence, $x = y = 2$.
The minimum value of $12x + 8y = 20 \times 2 = 40$

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

If $x + y + z = 0$ and $x^2 + y^2 + z^2 = 26$, find $x^4 + y^4 + z^4$.

Text Solution

By a simple trial of $x = 1$, $y = 3$, $z = -4$ (or $x = -1$, $y = -3$, $z = 4$) it can be seen that $x + y + z = 0$ and $x^2 + y^2 + z^2 = 26$. Hence $x^4 + y^4 + z^4$ would be 1 + 81 + 256 = 338.

Alternate Solution:

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2 (xy + yz + zx)$
$\Rightarrow 0 = 26 + 2 (xy + yz + zx)$
$xy + yz + zx = -13$
$(xy + yz + zx) (x^2 + y^2 + z^2) = x^3y + xy^3 + xyz^2 + x^2yz + y^3z + yz^3 + zx^3 + z^3x + zxy^2$
$x^3 (y + z) + y^3 (x + z) + z^3 (x + y) + xyz (x + y + z)$
$= x^3 (x + y + z) - x^4 + y^3 (x + y + z) - y^4 + z^3 (x + y + z) - z^4 + xyz (x + y + z)$
As $x + y + z = 0$, $(-13) (26) = -x^4 - y^4 - z^4$
$\therefore x^4 + y^4 + z^4 = 338$ Ans: (338)

Q20. DIRECTIONS *for questions 20 to 23:* Select the correct alternative from the given choices.

Twenty persons went on a picnic. Three out of every five in the group do not like pulav but two out of every four carried pulav with them. Then, we can conclude that

a) **at least two persons who do not like pulav carried pulav with them.**

b) **at least eight persons who do not like pulav carried pulav with them.**

c) **at most eight persons who do not like pulav carried pulav with them.**

d) **at most two persons who do not like pulav carried pulav with them.**

Text Solution

12 do not like pulav; 10 carried pulav
$\therefore$ 20 – 12 = 8 like pulav but 10 carried pulav.
10 – 8 = 2 $\Rightarrow$ at least two, who do not like pulav carried it. Choice (A)

Q21. DIRECTIONS *for questions 20 to 23:* Select the correct alternative from the given choices.

If the roots of the equation $(x - p)(x - q) + r = 0$ are 4 and 5, where p, q and r are non-zero positive integers, then what is the highest possible value of r?

a) **12**

b) **16**

c) **18**

d) **20**

Text Solution

The equation can be written as $x^2 - (p + q)x + pq + r = 0$
$pq + r = 20$ and $p + q = 9$
If r is to be maximum, pq must be minimum. Since $p + q$ is a constant, pq will be minimum if $p - q$ is maximum.
Hence, p and q can be 1 and 8 in any order.
Maximum value of $r = 20 - 8 = 12$. Choice (A)

Q22. DIRECTIONS *for questions 20 to 23:* Select the correct alternative from the given choices.

If the product of a surd $a + \sqrt{b}$ and its conjugate is 33 and the product *ab* is 18, which of the following can be the value of *a*?

a) **2**

b) **3**

c) **6**

d) **9**

Text Solution

Given $(a + \sqrt{b}) \times (a - \sqrt{b}) = 33 \Rightarrow a^2 - b = 33$

Also, $ab = 18 \Rightarrow b = 18/a$

$$a^2 - \frac{18}{a} = 33 \Rightarrow a^3 - 33a - 18 = 0$$

From the options, a can only be 6.

Alternative Solution:

Considering each option, we can also calculate the possible value of b, and check for the product $(a + \sqrt{b})(a - \sqrt{b}) = 33$. For example, if $a = 2$ and given $ab = 18$, $b = 9$, and $(2 + \sqrt{9})(2 - \sqrt{9}) \neq 33$.

But for $a = 6$, $b = 3$ $(6 + \sqrt{3})(6 - \sqrt{3}) = 33$.

Hence, Choice (C) Choice (C)

Q23. DIRECTIONS *for questions 20 to 23:* Select the correct alternative from the given choices.

Two sisters, Aparna and Sushma, were born on the same day of the week in two different years and they celebrate their birthdays on the same day of the week every year. If Aparna was born on 7th February 2005, then which of the following can be the date of birth of Sushma?

a) **10th January, 2011**

b) **7th March, 2006**

c) **13th March, 2012**

d) **24th January, 2009.**

Text Solution

As Aparna and Sushma celebrate their birthdays on the same day of the week every year, they both must have been born either before 29th February or after 29th February. As Aparna was born on 7th February. Sushma must have been born before 28th February.
As both were born on the same day of the week, the birthday of Aparna must fall on the same day of the week in the year in which Sushma was born as it was in the year in which Aparna was born i.e, the number of odd days between the year in which Aparna was born and the year in which Sushma was born must be a multiple of 7.
The number of odd days from 2005 to 2009
1(2005) + 1(2006) + 1(2007) + 2(2008) = 5 days
The number of odd days form 2005 to 011 =
1(2005) + 1(2006) + 1(2007) + 2(2008) + 1(2009) + 1(2010) = 7 days.
Hence, Sushma was born on 10th January, 2011. Choice (A)

Q24. DIRECTIONS *for question 24:* Type in your answer in the input box provided below the question.

When 952 divides a number, the remainder left is 124. Find the remainder left if 68 divides the same number.

Text Solution

Let the number which 952 divides be N.
So N = 952q + 124 where q is the quotient.
So N = 68(14q + 1) + 56.
When 68 divides N, the quotient would be 14q + 1 and the remainder will be 56.
Ans: (56)

Q25. DIRECTIONS *for question 25:* Select the correct alternative from the given choices.

John participated in a 500 m race, during which he increased his speed by 10% after every 100 m that he covered. If he finished the race in 3 minutes and 14 seconds, what was his approximate speed for the first 100 m of the race?

a) **7.73 kmph**

b) **6.12 kmph**

c) **6.47 kmph**

d) **7.12 kmph** Text Solution

Let his initial speed be a m/s.
His speed for every subsequent 100 m will be $1.1a$, $(1.1)^2a$, $(1.1)^3a$ and $(1.1)^4a$.
Time taken to finish the race

$$= \frac{100}{a} + \frac{100}{1.1a} + \frac{100}{(1.1^2)a} + \ldots \frac{100}{(1.1^4)a}$$

$$= \frac{100}{a}\left(1 + \frac{1}{1.1} + \frac{1}{1.1^2} + \frac{1}{1.1^3} + \frac{1}{1.1^4}\right)$$

$$= \frac{100}{a} \times \frac{\left[1\left(1 - \left(\frac{1}{1.1}\right)^5\right)\right]}{\left(1 - \frac{1}{1.1}\right)}$$ (using sum to n terms in GP)

$$= \frac{100}{a} \times \left(\frac{0.379}{0.091}\right) = \frac{100}{a}(4.165)$$

Given, the time is 194 seconds.

$$\frac{100}{a}(4.165) = 194$$

$\Rightarrow a = 2.147$ m/s, i.e., $2.147 \times \frac{18}{5} = 7.73$ kmph. Choice (A)

Q26. DIRECTIONS *for question 26:* Type in your answer in the input box provided below the question.

A plane is divided into 79 regions by drawing several straight lines. What is the minimum number of lines required for the division?

Text Solution

1 line can divide a plane into 2 parts
2 lines can divide a plane into at most 4 parts (i.e. 2 more)
3 lines, into at most 7 parts (i.e. 3 more)
4 lines, into at most 11 parts (i.e. 4 more)

$\therefore$ n lines can divide a plane into $1 + (1 + 2 + 3 + \ldots.. + n)$ parts or $\frac{n(n+1)}{2} + 1$ parts.

Given $\frac{n(n+1)}{2} + 1 = 79$

$\Rightarrow n(n + 1) = 156 = 12(13)$

$\therefore n = 12$

i.e., to divide a plane into 79 parts, we need a minimum of 12 lines Ans: (12)

Q27. DIRECTIONS *for questions 27 to 30:* Select the correct alternative from the given choices.

Tarun and Varun invested in a business in the ratio of 4 : 5, at the beginning of a year. If Tarun withdrew from the partnership after eight months, what percentage of the annual profit will Tarun receive?

a) **34.78%**

b) **33.33%**

c) **29.63%**

d) **35%**

Text Solution

Ratio in which profits are to be divided = (Initial investment of Tarun) × (Number of months) : (Initial investment of Varun) × (Number of months) = 4 × 8 : 5 × 12 = 8 : 15
Percentage of profit that Tarun will receive = 8/23 × 100 = 34.78% Choice (A)

Q28. DIRECTIONS *for questions 27 to 30:* Select the correct alternative from the given choices.

Tap A and Tap B, when opened simultaneously, completely fill an empty tank in 20 minutes. If Tap A alone can fill three-quarters of the tank in 33 minutes, how long will it take Tap B alone to completely fill the tank?

a) **35 minutes**

b) **34.33 minutes**

c) **36.67 minutes**

d) **34 minutes**

Text Solution

Let a and b be the time taken by Tap A and Tap B individually to fill the tank.
Given that

$$\frac{1}{a}+\frac{1}{b}=\frac{1}{20}$$

Also, a = 44 minutes (since Tap A can fill three quarters of the tank in 33 minutes, it takes 44 minutes for Tap A to fill the entire tank).

$$\therefore \frac{1}{b}=\frac{1}{20}-\frac{1}{44}=\frac{3}{110} \Rightarrow b=\frac{110}{3}=36.67 \text{ minutes}$$

Choice (C)

Q29. DIRECTIONS *for questions 27 to 30:* Select the correct alternative from the given choices.

The question below is followed by two statements, I and II. Study whether the information given in the statements is sufficient to answer the question and select the correct answer option.

If *a*, *b* and *c* are natural numbers, is $ab^2 + 2bc + a^2c$ even?

I. $ab + c^2$ is odd

II. $bc + a$ is odd

a) **The question can be answered using one of the statements alone, but cannot be answered using the other statement alone.**

b) **The question can be answered using either statement alone.**

c) **The question can be answered using I and II together but not using I or II alone.**

d) **The question cannot be answered even using I and II together.** Text Solution

From statement I, $ab + c^2$ is odd implies the following cases

	a	b	c	$ab + c^2$	$Ab^2 + 2bc + a^2c$
1	Even	Even	Odd	Odd	Even
2	Even	Odd	Odd	Odd	Even
3	Odd	Even	Odd	Odd	Odd
4	Odd	Odd	Even	Odd	Odd

Therefore we cannot say if $ab^2 + 2bc + ac^2$ is even or odd from the statement I. Thus statement I alone is not sufficient.
From statement II, $bc + a$ is odd implies the following cases.

	b	c	a	$bc + a$	$ab^2 + 2bc + a^2c$
1	Even	Even	Odd	Odd	*Even*
2	Even	Odd	Odd	Odd	Odd
3	Odd	Even	Odd	Odd	Odd
4	Odd	Odd	Even	Odd	Even

Thus from statement II, we cannot say if $ab^2 + 2bc + a^2c$ is even or odd. Therefore statement II alone is not sufficient.
Even by using both the statements together, we cannot determine if $ab^2 + 2bc + a^2c$ is even or not.
Thus the question cannot be answered even by using both the statements together.
Choice (D)

Q30. DIRECTIONS *for questions 27 to 30:* Select the correct alternative from the given choices.

Kiran had only Rs.10 notes and Rs.5 notes with him when he went to a stationery shop. He purchased two erasers and six pencils from the shop and paid the exact amount using three notes of

a single denomination. If the price of a pencil is Rs.3 more than that of an eraser, what is the price of two erasers and nine pencils?

a) **Rs.40**

b) **Rs.43.5**

c) **Rs.52**

d) **Rs.48**

Text Solution

Let the price of an eraser be e and the price of a pencil be p.
Given that $p = e + 3$
$2e + 6p$ can be either 30 or 15. However, it cannot be 15 because the price of the eraser will become negative in this case.
Hence, $2e + 6p = 30$
$e = 1.5$ and $p = 4.5$
The price of 2 erasers and 9 pencils = ₹43.50 Choice (B)

Q31. DIRECTIONS *for questions 31 and 32:* Type in your answer in the input box provided below the question.

The average weight of five persons in a group was 76 kg. After one year, the average weight of the same group became 81 kg. If each person in the group gained at least 2 kg, what is the maximum weight that any person in the group could have gained? Text Solution

The increase in the weight of all five persons together
$= 5 \times (81 - 76) = 25$ kg
To find the maximum possible increase in weight of any person in the group, let the other four persons have the least possible increase in weight, i.e., 2 kg each.
Therefore, $2 \times 4 = 8$ kg of increase in weight was due to the four persons.
Hence, the maximum possible increase in weight of the fifth person would be $25 - 8 = 17$ kg Ans: (17)

Q32. DIRECTIONS *for questions 31 and 32:* Type in your answer in the input box provided below the question.

The difference between the simple interest and the compound interest accrued in two years on a certain sum at a certain rate of interest is Rs.80. If the simple interest for the second year is Rs.1000, find the sum (in Rs.)

Text Solution

₹80 = interest on SI for 1 year
⇒ ₹80 = r% of 1000
⇒ r = 8
Now if 8% of S = 1000
S = 12,500 Ans: (12,500)

Q33. DIRECTIONS *for question 33:* Select the correct alternative from the given choices.

In a test on English, Mathematics and Reasoning, for every question on English, there are three questions on Mathematics and for every two questions on Mathematics, there are seven questions on Reasoning. If Roopa, who attempted all the questions on English, half the number of questions on Mathematics and one-third the number of questions on Reasoning, attempted 36 questions in all, what is the total number of questions in the test?

a) **69**

b) **87**

c) **75**

d) **93**

Text Solution

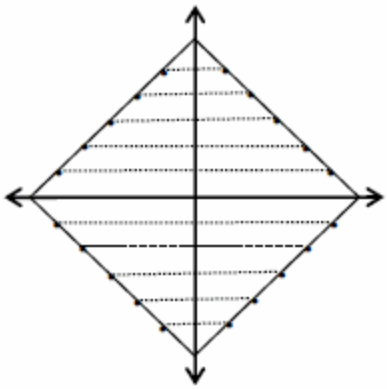
Then number of questions on English, Mathematics and Reasoning can be represented as $2e$, $6e$ and $21e$ respectively. Now, Roopa would have attempted $2e + 3e + 7e = 12e$ questions, which is given as equal to 36. If $12e = 36$, the total number of questions = $2e + 6e + 21e = 29e$ will be $29 \times 36/12 = 87$.

Choice (B)

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

What is the number of points with integer coordinates in the co-ordinate plane which satisfy the inequality $|x| + |y| < 6$?

Text Solution



The points that satisfy the given condition lie in the square with vertices at (6, 0), (0, 6) (–6, 0) and (0, –6). In each quadrant there are 10, i.e., 40 points in all with integral coordinates. On each of the 4 rays (the positive and negative x axis and the positive and negative y axis). There are 5 points i.e. 20 points in all. The origin also has integral coordinates. Thus there are 40 + 20 + 1 or 61 points in all.

Ans: (61)