

**DIRECTIONS** for questions 1 to 4: The passage given below is accompanied by a set of four questions. Note that the sentences of the second paragraph of the passage (which are labelled 1 to 5) are not necessarily given in the correct sequential order. Also, the last sentence of the third paragraph has been intentionally left out. Read the passage and choose the best answer to each question.

Not so long ago there was a vogue for asserting that globalisation had 'ended geography' and created a 'flat world'. When financial trading was a matter of human beings looking at screens, that had a certain plausibility, because the intrinsic slowness of humans' eyes and brains easily masked the small disparities in the time taken to transfer data between different geographic locations. But now that computers, not humans, are doing the trading, geography matters exquisitely. With any of these technologies – fibre-optic cable, microwave, millimetre wave, laser transmission through the atmosphere – the exact route taken is crucial.

(1) It's now close to impossible, to put new microwave dishes along that crowded geodesic: all the space on the towers closest to it is already rented. (2) As a result, no one is easily going to beat McKay Brothers, which owns the fastest, geodesic-hugging Aurora-New Jersey microwave link. (3) When you talk to high-frequency traders, you quickly learn that the world's financially most important geodesic – the spinal cord of US capitalism – runs from Aurora, a town in Illinois that's now essentially an outer suburb of Chicago, to northern New Jersey. (4) The dishes can interfere with one another, so you need permission from the Federal Communications Commission to build new towers or install new dishes. (5) The shortest and fastest route on the surface of the earth between any two places is called a 'geodesic' or great circle.

Aurora matters to global finance because in 2012 the Merc, the Chicago Mercantile Exchange, relocated its electronic trading system to a new data centre there. The Merc trades futures: originally, futures on eggs, onions and other agricultural commodities, but since 1972 financial futures as well. Chicago futures trading used to be done face to face (by voice, or eye contact and hand signal) in raucous, crowded trading pits. The Merc's pit traders fiercely resisted the coming of electronic trading: its leading advocate, Leo Melamed, received frequent death threats. \_\_\_\_\_

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

Which of the following best explains the shift in importance of 'geography' based on the evidence given in the passage?

- a) Technologies like fibre-optic cable, microwave, etc. have made data transfer so fast that distances do not matter anymore.
- b) Globalization has created a flat world where any place is easily accessible making geography irrelevant.
- c) The briefest hiatus matters because of the high speed of computers, and that makes geography relevant.
- d) The latest computers are as fast as humans if kept at the right location and hence, geography matters.

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>44</b>
Avg. time spent on this question by all students	<b>337</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>327</b>
% of students who attempted this question	<b>45.37</b>
% of students who got the question right of those who attempted	<b>39.41</b>

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**Number of words and Explanatory notes for RC:**

Number of words: 323

The para clearly talks about two different eras. The first era was when globalisation made geography irrelevant because distance had shrunk between people and the world was flat. The second era is that of machines which are faster than humans. The disparities in timing that were earlier covered up because of the slowness of humans cannot be covered up when machines are performing those functions, like trading. Hence, geography has become important again, according to the author.

Option A: The first half of this option is correct and all the examples given have made data transfers so fast. But, because their location matters now, geography is more important than ever before. That is because even a fraction of an infinitesimal amount of time cannot be ignored anymore because of the use of computers. Hence, choice A is not the answer.

Option B: While it is true that globalization made geography irrelevant, the first para doesn't end there and proceeds further to talk about how geography has become important once again, thanks to computers doing the trading. That part has not been represented in the option. Hence, choice B is not the answer.

Option C: The smallest breaks in time are important when computers are trading instead of humans. That is why geography is important because 'With any of these technologies the exact route taken is crucial.' According to the passage, even the minor disparities in time which were ignored earlier because of the intrinsic slowness of humans, cannot be ignored anymore. C depicts the new-found importance of geography. Hence, choice C is the answer.

Option D: The latest machines are as fast as humans if kept at the right location. This statement is not factually correct. According to the para, the latest machines are faster than humans. In fact, they are so fast that earlier '**the intrinsic slowness** of humans' eyes and brains easily masked the **small disparities** in the time taken to transfer data' but now when machines are trading, these disparities matter. So, while the option is correct in that it says 'geography' is important, it is incorrect in the reason it gives for the importance of geography. Hence, choice D is not the answer.                      Choice (C)

undefined

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(1) It's now close to impossible, to put new microwave dishes along that crowded geodesic: all the space on the towers closest to it is already rented. (2) As a result, no one is easily going to beat McKay Brothers, which owns the fastest, geodesic-hugging Aurora-New Jersey microwave link. (3) When you talk to high-frequency traders, you quickly learn that the world's financially most important geodesic – the spinal cord of US capitalism – runs from Aurora, a town in Illinois that's now essentially an outer suburb of Chicago, to northern New Jersey. (4) The dishes can interfere with one another, so you need permission from the Federal Communications Commission to build new towers or install new dishes. (5) The shortest and fastest route on the surface of the earth between any two places is called a 'geodesic' or great circle.

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

As mentioned in the directions to the passage, the sentences in the second paragraph are given in a jumbled order. When properly sequenced, they form a coherent paragraph and continue the thought process from the first paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in the sequence of five numbers as your answer, in the input box given

below.

You did not answer this question [Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	3
Avg. time spent on this question by all students	184
Difficulty Level	VD
Avg. time spent on this question by students who got this question right	168
% of students who attempted this question	42.55
% of students who got the question right of those who attempted	22.67

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**Number of words and Explanatory notes for RC:**

Number of words: 323

Sentence 1 uses the term 'that crowded geodesic', indicating that it follows a sentence which talks about one specific geodesic.

Sentence 2 starts with 'As a result' - a connective – which suggests it follows some logical explanation for the importance of McKay Brothers/Aurora-New Jersey microwave link.

Sentence 3 talks about world's most important geodesic (which means it should follow a line which introduces geodesics) and also about Aurora and New Jersey. In other words, 3 introduces a particular geodesic, which is spoken about further in 1 (crowded geodesic). So, 3 should precede 1.

Sentence 4 speaks about 'the dishes' which means it probably comes after a line that has introduced dishes. Sentence 1 speaks about microwave dishes. So, 1 should precede 4.

Sentence 5 introduces the word 'geodesic', which means it should precede 3 which talks further about a particular geodesic. So, 5 should come in front of 3, which should come in front of 1 which should come in front of 4. Since, 2 begins with 'As a result' and completes the importance of the Aurora-New Jersey link, it follows 4 which is upstream to 2. One should get permission as it is crowded, which is why those who own space are important. Hence, the order is 53142. Ans: (53142)

undefined

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**Q3. DIRECTIONS for questions 3 and 4:** Select the correct alternative from the given choices.

As mentioned in the directions to the passage, the last sentence of the last paragraph of the passage has been deleted. Which of the following best completes the last paragraph?

- a) By 2004, however, the resistance had crumbled, and now nearly all the Merc's trading is electronic.
- b) Gradually, the clamour for electronic trading had died completely.
- c) The hope remains though, that one day global finance will wake up to newer technologies.
- d) The Chicago Mercantile Exchange though, is now moving closer to electronic trading.

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>1</b>
Avg. time spent on this question by all students	<b>131</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>118</b>
% of students who attempted this question	<b>40.19</b>
% of students who got the question right of those who attempted	<b>56.78</b>

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**Number of words and Explanatory notes for RC:**

Number of words: 323

A good last sentence should accomplish two things here:

- (1) Connect the past (Merc traders' resistance) to the present (Merc moving to electronic trading).
- (2) Logically end not just the para but also the passage, or in other words, complete the story of the importance of Aurora.

Option A: This line connects the past to the present and addresses both the aspects – the resistance and the acceptance, to explain what led to the change from 1972 to 2012. The resistance referred to here is the resistance from traders against electronic trading. This line therefore, moves on from the resistance to how things have come to Merc relocating its electronic trading system to a new data centre in Aurora. Hence, choice A is the answer.

Option B: If the clamour (demand) for electronic trading died, it means that the traders resisting it won. That leaves us with the open question as to how Merc went back to the electronic trading, as the first line of the para explains how Merc is into electronic trading now. The easy way to eliminate this option is using tone. This line is negative towards electronic trading whereas the para and the passage need an ending positive towards electronic trading. Hence, choice B is not the answer.

Option C: This line says there is hope for newer technologies. What are those newer technologies? If we assume it is electronic trading, the line will contradict the first line of the para which says Merc has moved fully to electronic trading. Hence, choice C cannot be the answer.

Option D: The Merc is moving closer to electronic trading still leaves a gap. That is because in 2012, the Merc is on electronic trading. The last line of the para and passage should certainly close the gap between 'moving closer to electronic trading' and 'relocating the trading system to a new data center' (which indicates they have adopted electronic trading completely). Hence, choice D is not the answer.

Choice (A)

undefined

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**Q4. DIRECTIONS** for questions 3 and 4: Select the correct alternative from the given choices.

Four alternative summaries of the **first** paragraph of the passage are given below. Choose the one which best captures the essence of the paragraph.

- a) After globalisation created a flat world, technologies like fibre-optic cable, millimetre wave, laser transmission and microwave have made geography relevant yet again with machines replacing humans in trading.
- b) With computers trading instead of humans, geography, which was once rendered irrelevant due to the relative slowness of human traders, has become crucial once again, affected by the kind of technology used.
- c) The intrinsic slowness of humans had made geography irrelevant but ever since computers are being used for trading, infinitesimal amounts of time have become precious as well and technologies used have started mattering like never before.
- d) The idea of a 'flat world' was once applicable to trading, when the slowness of human capabilities obscured the discrepancies in the times taken to transfer data between different locations, but with computers doing the trading now, geography has become relevant once again.

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>5</b>
Avg. time spent on this question by all students	<b>139</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>134</b>
% of students who attempted this question	<b>40.87</b>
% of students who got the question right of those who attempted	<b>48.61</b>

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[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 323

The sub-ideas of the para include: the world becoming a smaller place and **geography becoming irrelevant**, this being fine because **human slowness** compensated for the tiny amounts of **time lost in data transfers**, and now **things changing** because of **trading done by computers** whose speed has made geography relevant and **technology crucial**. It is important to note that while several technologies have been mentioned, the essence of the para need only mention technology as an idea. Examples are best avoided in good summaries. Similarly, factual distortion and rhetoric should be spotted and eliminated.

Option A: This option doesn't cover the slowness of humans which had compensated for the time lost in data transfer. Also, it lists out examples which should be avoided in the summary of a para. Technology directly hasn't made geography relevant either. Geography became important with computers doing the trading, where the smallest fractions of time have become crucial making geography important. Hence, Choice A is not the answer.

Option B: In this option 'geography, which was once rendered irrelevant due to the relative slowness of human traders' tends to mislead as it doesn't give the full picture. Geography wasn't rendered irrelevant as a result of slower trading by human traders. The point being made in the para is that geography wasn't important as data transfer lag wasn't detected because humans who were trading were not so fast as to feel that lag. Also, the slowness is not a characteristic of human traders as it seems to be in the option. It is more about the slowness of human trading. Therefore, Choice B is not the answer.

Option C: 'The intrinsic slowness of humans' is incorrect. We are talking about trading by humans and not human abilities. While the second part of the para is not inaccurate, the incorrect depiction of ideas, such as slowness of human trading compensating data transfer speed and geography not being so important until computers started trading, makes this option inappropriate as a summary. Hence, Choice C is not the answer.

Option D: This option covers all the ideas underscored above, from the irrelevance of geography through slower human trading compensating for data transfer lag, to the rising importance of technology making geography important again. Hence, Choice D is the answer.

Choice (D)

undefined

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The first Pulitzer prize for music went, in 1943, to William Schuman's Secular Cantata No. 2. It took 54 years before the judges recognised music beyond the European classical tradition, making Wynton Marsalis's 'Blood on the Fields' the first jazz winner. There have only been two jazz winners since then (Ornette Coleman in 2007 and Henry Threadgill in 2016) and, until this year, nothing from the world of popular song. The prize has long been criticised as stuffy and irrelevant, with even 2003 winner John Adams saying it has "lost much of the prestige it still carries in other fields like literature and journalism".

(1) 'Damn' is as ground-breaking a winner as was Bob Dylan's Nobel prize for literature last year, though less of a philosophical conundrum. (2) While even Dylan fans disagreed over whether songs qualified as literature, 'Damn' is clearly excellent American music. (3) So the only criticism that sticks is the fact that, unlike the two composers he beat, Lamar needs neither the publicity nor the \$15,000 prize money. (4) The only rule broken by its win is the archaic, unspoken one that reserves the Pulitzer for supposedly higher art forms. (5) By granting this year's award to Kendrick Lamar's album 'Damn', the Pulitzer board has gone from 0 to 60 mph in a spectacular way.

'Damn', the US's biggest-selling hip-hop album of 2017, has already taken home six MTV awards, five Grammys, NAACP Image Awards, a Brit, a Juno, a BET award and a Clio. But needing the award comes a poor second to deserving it. Lamar's Pulitzer has been celebrated as a vindication of hip-hop, and a particularly sweet one given that 'Damn' features a pointed sample of Geraldo Rivera on Fox News making the absurd claim that "hip-hop has done more damage to young African Americans than racism in recent years".

**Q5. DIRECTIONS for question 5:** Select the correct alternative from the given choices.

Four alternative summaries of the **first** paragraph of the passage are given below. Choose the one which best captures the essence of the paragraph.

- a) It took 54 years of Pulitzer history, which started in 1943, before the judges went beyond European classical tradition to pick the first

jazz winner in the ‘music’ segment. Just two more jazz winners since and none from popular song have pushed the conservative award into irrelevance.

- b) Judges of the Pulitzer prize for music took 54 years to recognise the first jazz winner beyond the European classical tradition, but their general disconnect with popular music has earned them criticism as being irrelevant and stuffy from winners like John Adams.
- c) 54 years after the first Pulitzer prize for music was given in 1943, the judges picked the first jazz winner, veering away from European classical tradition, but just two more jazz winners since then and none from popular music seems to resonate with the criticism the prize has received as being obsolete.

d) The Pulitzer for music has had three jazz winners in its illustrious history, the first being *Blood on the Fields* but it took 54 years for the prize to pick their first, European classical tradition dominating the scene until then. Nevertheless, the prize is now irrelevant as the world of popular music has largely been ignored.

You did not answer this question

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**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>18</b>
Avg. time spent on this question by all students	<b>294</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>294</b>
% of students who attempted this question	<b>38.51</b>
% of students who got the question right of those who attempted	<b>30.18</b>

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[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 307

The main sub-ideas in the first para of the passage include:

- (1) It took Pulitzer for music 54 years to go beyond the European classical tradition and pick the first jazz winner.
- (2) After that, we have had just two more jazz winners and none from popular music.
- (3) There has been criticism against the award for being 'stuffy' and 'irrelevant'.

Option A: While the first two points have been covered, the last part is slightly misleading. 'Just two more jazz winners since and none from popular song has pushed the conservative award into irrelevance' – this line suggests that the award got pushed into irrelevance because it picked just two more jazz winners and none from popular music. While this is a reason for the criticism, it is not one particular event, but more the track record that has attracted the criticism. Hence, Choice A is not the best summary.

Option B: 'Judges of the Pulitzer prize for music took 54 years to recognise the first jazz winner beyond the European classical tradition' seems to suggest that in 54 years, jazz winners from European classical tradition have been winning and for the first time, we have a jazz winner outside that tradition. That is misrepresentation of facts. The para says that it is the first time the judges went outside European classical tradition and they picked a jazz winner. Also, 'their general disconnect' suggests that it is the judges who have been criticised as irrelevant and stuffy. While judging has been the reason behind the criticism, the criticism is levelled overall at the award itself and not to a particular group of judges. Hence, Choice B is not the answer.

Option C: This option covers all the ideas. 54 years after the first Pulitzer prize for music was given in 1943, the judges picked the first jazz winner, veering away from European classical tradition, but just two more jazz winners since then and none from popular music seem to resonate with the criticism the prize has received as being obsolete. Hence, Choice C is the answer.

Option D: The first line doesn't suggest that three jazz winners in the history of the prize is a small number (the word 'only' in the original para is the indicator). 'Illustrious history' is a rhetorical expression that shouldn't be used in a summary because a summary doesn't include new opinions not alluded to in the para. Individual examples are not cited in a summary, but this option does so. Finally, the option suggests that popular music not getting awards has made the prize irrelevant. That is only part of the truth. The reason why the prize has received criticism is because it deviates from its classical tradition very rarely. Hence, Choice D is not the answer.                      Choice (C)

undefined

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music beyond the European classical tradition, making Wynton Marsalis's 'Blood on the Fields' the first jazz winner. There have only been two jazz winners since then (Ornette Coleman in 2007 and Henry Threadgill in 2016) and, until this year, nothing from the world of popular song. The prize has long been criticised as stuffy and irrelevant, with even 2003 winner John Adams saying it has "lost much of the prestige it still carries in other fields like literature and journalism".

(1) 'Damn' is as ground-breaking a winner as was Bob Dylan's Nobel prize for literature last year, though less of a philosophical conundrum. (2) While even Dylan fans disagreed over whether songs qualified as literature, 'Damn' is clearly excellent American music. (3) So the only criticism that sticks is the fact that, unlike the two composers he beat, Lamar needs neither the publicity nor the \$15,000 prize money. (4) The only rule broken by its win is the archaic, unspoken one that reserves the Pulitzer for supposedly higher art forms. (5) By granting this year's award to Kendrick Lamar's album 'Damn', the Pulitzer board has gone from 0 to 60 mph in a spectacular way.

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**Q6. DIRECTIONS for question 6:** Type in your answer in the input box provided below the question.

As mentioned in the directions to the passage, the sentences in the second paragraph are given in a jumbled order. When properly sequenced, they form a coherent paragraph and continue the thought process from the first paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in the sequence of five numbers as your answer, in the input box given below.

**You did not answer this question** [Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	3
Avg. time spent on this question by all students	162
Difficulty Level	VD
Avg. time spent on this question by students who got this question right	146
% of students who attempted this question	34.43
% of students who got the question right of those who attempted	25.98

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 307

In (1), we have an independent sentence, without grammatical or word-connections to other sentences. It is obvious that (2) should always come after (1) (not necessarily immediately after) because while the first sentence has full name Bob Dylan, the second one doesn't, using just Dylan (half-name usually suggests that name has been introduced elsewhere). (3) starts with 'So', a positive connection to a previous sentence, that seems to suggest it follows another sentence that discusses some other criticism that isn't justified. The other sentences which address possible criticism are (4) [an archaic rule has been broken] and 1 [a ground-breaking winner]. (4) uses 'its' which means it should follow a sentence that has the name of the album – (5)/(1)/(2). But, (2) comes before (1). Which means (4) should follow (1) and (3) follows (4) as explained above.

The album and win have been introduced in (5), so, (5) should come before (2) and before any other sentence as every other sentence talks about the album and the win. (1) comes ahead of (2) as explained above. So, the order has to be 51243.

Ans: (51243)

undefined

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**Q7. DIRECTIONS** for question 7: Select the correct alternative from the given choices.

As mentioned in the directions to the passage, the last sentence of the last paragraph of the passage has been deleted. Which of the following best completes the last paragraph?

- a) Four decades after it evolved out of Bronx DJ culture, hip-hop is both critically adored and commercially supreme.
- b) Moreover, hip-hop has always been a distant cousin of the more popular 'jazz' that has received the Pulitzer nod in the past.
- c) The world may not know who Geraldo Rivera is, but the Pulitzer nod to hip-hop has ensured the world definitely knows who Lamar is.
- d) In fact, the Pulitzer goes a long way in dispelling this racism.

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	4
Avg. time spent on this question by all students	134
Difficulty Level	VD
Avg. time spent on this question by students who got this question right	135
% of students who attempted this question	29.75
% of students who got the question right of those who attempted	40.87

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 307

The para talks about all the awards 'Damn' was received, then moves on to explain how the album deserves the award more than it needs it, citing the unfair allegation by Gerald Rivera that hip-hop is more dangerous than racism which also causes a slight imbalance in the para and needs to be followed by something that ends the para on a note of positivity underlining the essence of the album-win.

Option A: While it continues the flow of the para, (you shouldn't eliminate this option, only compare it with other better options), it talks about hip-hop, which is not a balanced ending for a para/passage more about Lamar and his album than hip-hop. Choice A is therefore, not the best possible ending of the para.

Option B: Moreover, is a positive connection, 'distant cousin' a negative term. This line seems to suggest something negative about hip-hop with respect to the more popular jazz. Hence, it cannot be a logical ending to a para that otherwise tries to glorify ('vindicate' is a strong positive word) hip-hop. Hence, Choice B is not the answer.

Option C: The sentence starts with addressing the previous line and like all good last lines of a para, moves on to address hip-hop which is discussed in the para and finally ends on a positive note for Lamar, who is the 'hero' of the passage. The last part makes Choice C a better option than Choices A or D. Hence, Choice C is the answer.

Option D: The option uses the term 'this racism' but the last line doesn't particularly refer to any type of 'racism'. Further, the discussion is only about the fact that the work received the award, there is indication at all of the social effect of the music or the lyrics. While option D could begin such a para, were the effects to be discussed, it has no contextual relevance here. Hence, Choice D is not the answer.

Choice (C)

undefined

**DIRECTIONS for questions 8 to 10:** The passage given below is accompanied by a set of three questions. Note that the sentences of the second paragraph of the passage (which are labelled 1 to 5) are not necessarily given in the correct sequential order. Also, the last sentence of the third paragraph has been intentionally left out. Read the passage and choose the best answer to each question.

Are we alone in the universe? Of all the billions of stars out there, is there none around where intelligent life has arisen, no other conscious beings who have looked at their sky and asked themselves whether there was anyone else out here? All we can know is that we don't know of any others. But that has not stopped more or less well-informed speculation. The universe is so unthinkably enormous and old that it seems almost impossible that only one of the quintillion or so stars in the universe has actually developed intelligent life.

(1) Few of the explanations proposed for it are cheering. (2) Perhaps the first culture to develop interstellar travel has already snuffed out all its rival species as they emerge, and is at this moment watching our first tentative explorations of the solar system as a cat might watch a fledgling on the ground. (3) So, where are they and if they exist, why haven't we seen them yet?, asked the physicist Enrico Fermi in 1950. (4) The mismatch between what we'd expect from the numbers, which is a universe full of spacefaring civilisations, and what we observe – nothing – is known as the Fermi Paradox. (5) Or perhaps, all civilisations advanced enough to develop space travel are also technologically capable of annihilating themselves as well, and perhaps they all do.

Maybe, we have simply got the numbers wrong. This last explanation comes from three Oxford philosophers, whose recently published paper examines the equations that make the Fermi paradox look real. These have to do partly with the number of stars with Earth-like planets in the universe, and, more crucially, with the probabilities of life evolving there, then becoming intelligent, and finally exploring space. None of these are known and we don't yet know enough to make well-informed guesses. So the numbers that are plugged into all seven terms of the equations that estimate the likelihood of other life in the universe can vary by 12 or more orders of magnitude. The Oxford paper shows that when you take these uncertainties into account and run hundreds of thousands of simulations exploring them, the probability that we are alone in our galaxy, and perhaps in the universe, rises to entirely reasonable levels.

**Q8. DIRECTIONS** for question 8: Select the correct alternative from the given choices.

Four alternative summaries of the **first** paragraph of the passage are given below. Choose the one which best captures the essence of the paragraph.

- a) While we cannot know whether we are alone in the universe, it is hard not to believe we are, considering the massive number of stars and the possibility that at least one more has developed intelligent life in a universe that is reasonably old.
- b) While it is hard to deduce whether we are alone, well-informed speculation by Fermi indicates we aren't, given the enormous number of stars which can develop intelligent life and given the age of the universe.
- c) Enrico Fermi, like everyone else, speculated around whether it is possible to be alone in an enormous and old universe with billions of star systems in which intelligent life could have developed.
- d) While we don't know if there is anyone else out there, one can't avoid well-informed speculation around the possibility of intelligent life in at least one of the innumerable stars in a universe so old and colossal.

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	31
Avg. time spent on this question by all students	233
Difficulty Level	D
Avg. time spent on this question by students who got this question right	225
% of students who attempted this question	36.02
% of students who got the question right of those who attempted	61.62

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 375

The sub-ideas in the first para include: a question (whether we are alone despite the presence of billions of stars), the speculation (that surely there is another star with intelligent life in a universe this big and old) and another question posed by Fermi (where is the intelligent life).

Option A: 'While we cannot know whether we are alone in the universe, it is hard not to believe we are'. The underlined portion indicates it is easier to believe we are alone. That contradicts the tone of the para, which is more like 'it is hard to believe we are alone' (given the size of the universe, the age, and the presence of billions of the stars). Hence Choice A is not the answer.

Option B: In this line, your radars should catch the misinformation in 'well-informed speculation by Fermi indicates we aren't' because Fermi was not the only one who speculated. Speculation has been by anyone and everyone, no one specific. Also, Fermi didn't definitively pronounce that 'we aren't alone'. Hence, Choice B is not the answer.

Option C: While this line seems to be covering all the ideas, 'billions of stars that can develop intelligent life' is misleading because of usage of the relative pronoun 'that'. This expression indicates there are billions of stars capable of developing intelligent life. However, that is not the contention of the para. The para says there are billions of stars. So, surely there is at least one more that has developed intelligent life. Hence, Choice C is not the answer.

Option D: While we don't know if there is anyone else out there, one can't avoid well-informed speculation around the possibility of intelligent life in at least one of the innumerable stars in a universe so old and colossal. The underlined portions show that all the sub-ideas in the para have been covered. Hence, Choice D provides the best summary and hence, is the answer.

Choice (D)

undefined

**DIRECTIONS** for questions 8 to 10: The passage given below is accompanied by a set of three questions. Note that the sentences of the second paragraph of the passage (which are labelled 1 to 5) are not necessarily given in the correct sequential order. Also, the last sentence of the third paragraph has been intentionally left out. Read the passage and choose the best answer to each question.

Are we alone in the universe? Of all the billions of stars out there, is there none around where intelligent life has arisen, no other conscious beings who have looked at their sky and asked themselves whether there was anyone else out here? All we can know is that we don't know of any others. But that has not stopped more or less well-informed speculation. The universe is so unthinkably enormous and old that it

seems almost impossible that only one of the quintillion or so stars in the universe has actually developed intelligent life.

(1) Few of the explanations proposed for it are cheering. (2) Perhaps the first culture to develop interstellar travel has already snuffed out all its rival species as they emerge, and is at this moment watching our first tentative explorations of the solar system as a cat might watch a fledgling on the ground. (3) So, where are they and if they exist, why haven't we seen them yet?, asked the physicist Enrico Fermi in 1950. (4) The mismatch between what we'd expect from the numbers, which is a universe full of spacefaring civilisations, and what we observe – nothing – is known as the Fermi Paradox. (5) Or perhaps, all civilisations advanced enough to develop space travel are also technologically capable of annihilating themselves as well, and perhaps they all do.

Maybe, we have simply got the numbers wrong. This last explanation comes from three Oxford philosophers, whose recently published paper examines the equations that make the Fermi paradox look real. These have to do partly with the number of stars with Earth-like planets in the universe, and, more crucially, with the probabilities of life evolving there, then becoming intelligent, and finally exploring space. None of these are known and we don't yet know enough to make well-informed guesses. So the numbers that are plugged into all seven terms of the equations that estimate the likelihood of other life in the universe can vary by 12 or more orders of magnitude. The Oxford paper shows that when you take these uncertainties into account and run hundreds of thousands of simulations exploring them, the probability that we are alone in our galaxy, and perhaps in the universe, rises to entirely reasonable levels.

**Q9. DIRECTIONS** for question 9: Type in your answer in the input box provided below the question.

As mentioned in the directions to the passage, the sentences in the second paragraph are given in a jumbled order. When properly sequenced, they form a coherent paragraph and continue the thought process from the first paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in the sequence of five numbers as your answer, in the input box given below.

**You did not answer this question** [Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>14</b>
Avg. time spent on this question by all students	<b>164</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>144</b>
% of students who attempted this question	<b>30.3</b>
% of students who got the question right of those who attempted	<b>18.46</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 375

'Few' of the explanations' means 'no explanations'. ('A few' means 'some'. 'Few' means 'hardly any') The clue in (1) apart from this negativity is the word 'it'. There is something in the para that needs explanations, but all explanations are negative and none cheering. (2) is a negative explanation being alluded to in (1). (3) asks a question that continues the tone of the last line of the first para, which means it will be in the upper half of the second para and probably right at the top. So, we move on to (4), which gives us a definition, of Fermi Paradox, which in a way is the answer to the question asked in (3). (5) is another negative explanation.

25 is a logical block, because 5 starts with "Or perhaps", and hence, it should be the second 'perhaps' line. 2 is the other perhaps line. Hence, 25. 125 is a block because 25 are explanations alluded to 1. Question is, what is the 'it'. In the remaining two lines, 3 and 4, the only possibility for 'it' is Fermi Paradox. So, 41 is a logical block. 4 is an explanation to the question in 3. So, 34125 is the coherent order.

Ans: (34125)

undefined

**DIRECTIONS** for questions 8 to 10: The passage given below is accompanied by a set of three questions. Note that the sentences of the second paragraph of the passage (which are labelled 1 to 5) are not necessarily given in the correct sequential order. Also, the last sentence of the third paragraph has been intentionally left out. Read the passage and choose the best answer to each question.

Are we alone in the universe? Of all the billions of stars out there, is there none around where intelligent life has arisen, no other conscious beings who have looked at their sky and asked themselves whether there was anyone else out here? All we can know is that we don't know of any others. But that has not stopped more or less well-informed speculation. The universe is so unthinkable enormous and old that it seems almost impossible that only one of the quintillion or so stars in the universe has actually developed intelligent life.

(1) Few of the explanations proposed for it are cheering. (2) Perhaps the first culture to develop interstellar travel has already snuffed out all

its rival species as they emerge, and is at this moment watching our first tentative explorations of the solar system as a cat might watch a fledgling on the ground. (3) So, where are they and if they exist, why haven't we seen them yet?, asked the physicist Enrico Fermi in 1950. (4) The mismatch between what we'd expect from the numbers, which is a universe full of spacefaring civilisations, and what we observe – nothing – is known as the Fermi Paradox. (5) Or perhaps, all civilisations advanced enough to develop space travel are also technologically capable of annihilating themselves as well, and perhaps they all do.

Maybe, we have simply got the numbers wrong. This last explanation comes from three Oxford philosophers, whose recently published paper examines the equations that make the Fermi paradox look real. These have to do partly with the number of stars with Earth-like planets in the universe, and, more crucially, with the probabilities of life evolving there, then becoming intelligent, and finally exploring space. None of these are known and we don't yet know enough to make well-informed guesses. So the numbers that are plugged into all seven terms of the equations that estimate the likelihood of other life in the universe can vary by 12 or more orders of magnitude. The Oxford paper shows that when you take these uncertainties into account and run hundreds of thousands of simulations exploring them, the probability that we are alone in our galaxy, and perhaps in the universe, rises to entirely reasonable levels.

**Q10. DIRECTIONS** for question 10: Select the correct alternative from the given choices.

As mentioned in the directions to the passage, the last sentence of the last paragraph of the passage has been deleted. Which of the following best completes the last paragraph?

- a) Nevertheless, the Fermi paradox vanishes.
- b) There is quite probably no one out there to rescue or to care about us and what happens to our species is in our hands alone.
- c) So, in the end it is obvious why speculation about possibility of life elsewhere is not really misplaced.
- d) The hundreds of thousands of simulations make one thing clear: we are alone.

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	8
Avg. time spent on this question by all students	149
Difficulty Level	D
Avg. time spent on this question by students who got this question right	141
% of students who attempted this question	28.39
% of students who got the question right of those who attempted	25.66

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 375

Option A: The last sentence of the para given supports the argument that we may be alone in the universe. This can be inferred from the statement 'the probability that we are alone in our galaxy, and perhaps in the universe, rises to entirely reasonable levels'. By that logic, 'the Fermi paradox vanishes' will be a good ending because Fermi paradox is around wondering how we are alone. However, 'nevertheless' makes a negative connection with the preceding line. So, two lines which agree with each other in tone cannot be separated by 'nevertheless' as is the case here. Hence, Choice A is not the answer.

Option B: This line continues the tone of the previous line that we may be alone in the universe and that our destiny is our hands and not in the hands of some space predators lurking elsewhere (as alluded to in the previous para). Also, it concludes an already well-balanced line. Hence, Choice B is the answer.

Option C: The part 'speculation about possibility of life elsewhere is not really misplaced' means there could be life elsewhere, which directly contradicts the previous line that says the possibility of no life existing rises to a reasonable level. The last line of a para cannot contradict the tone of the para, unless it starts with a 'contrast' word like 'nevertheless', 'but', 'yet', etc. Hence, Choice C is not the answer.

Option D: If 'make one thing clear: we are alone' this is true, then the previous line wouldn't use the expression 'probability rises to entirely reasonable levels'. There is an obvious mismatch. We are still not sure if we are alone. The probability is high, that is all. So, Choice D is not the answer.

Choice (B)

**DIRECTIONS** for questions 11 to 16: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

At a factory in Accrington, Britain, a company Emerson & Renwick has expanded beyond its formative business of making wallpaper/newspaper-printing equipment. A new machine "Genesis" has been designed to coat and print electrical devices. Like a conventional printer, it puts sequential coatings onto webs (long rolls) of material such as plastic film, flexible glass and metal foil. The printed items are then cut out and used in various products.

Emerson & Renwick produces special carts which are wheeled into the printing system to configure it for different applications. Some carts contain equipment that accelerates ions from a plasma onto a source material, to spatter molecules from that source onto the web, allowing printing at the atomic scale. Others perform a similar trick using a beam of electrons. Others employ chemically reactive gases to etch features such as holes and channels less than 50 nanometres across into the coatings, for electrical connections.

The underlying technologies of the Genesis machine are similar to those found in a conventional graphics press. Careful management of the web through its winding, tension and control is essential. A break in the web, as any newspaperman knows, brings production to a time-consuming and expensive halt and could damage a whole reel.

Printing electronics requires special formulations of ink. Often, these are made with silver which is expensive. An alternative, being worked on by Tawfique Hasan at Cambridge University, is to include flakes of graphene in such inks which reduces the cost drastically. Another idea he is exploring is "smart" wallpaper. In addition to graphene ink, this uses either organic light-emitting diodes (OLEDs) or quantum dots – crystals of semiconducting material. These emit light when excited by electricity, so wall coverings printed with such materials could be used to illuminate rooms.

Several groups are working on making thin-film solar panels using printed electronics. A family of crystalline materials called perovskites is attracting interest for roll-to-roll printing. Whereas the best conventionally made silicon-based solar panels convert the energy in sunlight into electricity with an efficiency of 20%, researchers in California, think they can push that to 31% using perovskites. Being small, crystalline grains, perovskites make ideal ingredients of ink.

Inkjet printing is also getting a roll-to-roll makeover, according to David Bird of the Centre for Process Innovation (CPI), Britain. Inkjet printers are not particularly fast, but they are parsimonious, for they spray ink only where it is needed. They are flexible and easily customised. To alter what is being printed requires only a software reload, rather than the changing of a printing plate. And lack of speed is relative. The CPI's inkjet machine can print copper circuits onto rolls of plastic at a rate of 17 metres a minute. These circuits are used for sensors and radio antennae. Like inkjet printers, 3D printers – which can also print electronics – are flexible, but they build things one at a time or in small batches and are mostly used to print larger objects. ....

Single-sheet or batch production permits an error to be spotted before it is repeated, but high-speed roll-to-roll systems can churn out a lot of waste if there is any delay in identifying problems. Cameras can be used to detect errors in printed text or graphics, but they are not much help at spotting faults in microscopic layers of transparent material whizzing past on a web. Researchers at CPI have come up with a method that builds a three-dimensional model of the web's surface using reflected light, and can raise the alarm if it detects depressions that might indicate an uncoated spot.

At present printed electronic products tend to be used as components rather than complete systems. The technology is a long way from being able to roll-print powerful computer chips, which contain several billion transistors squeezed onto a tiny piece of silicon. These processors are currently made in batches in costly semiconductor fabrication plants.

Using roll-to-roll systems to print lots of transistors in the form of a processor is nevertheless an attractive proposition. Ma Zhenqiang of the University of Wisconsin-Madison and his colleagues recently fabricated a flexible transistor that operates at 110 gigahertz. Dr Ma used an electron beam to etch shapes just ten nanometres wide in a mould that was then employed to form the transistor's circuitry in an ultra-thin flexible silicon membrane. As the mould can be reused, Dr Ma reckons his method could easily be scaled up for roll-to-roll processing.

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**Q11.** Which of the following is not a feature of special carts employed by Emerson and Renwick in their printing machine "Genesis" in Accrington, Britain?

- a) Acceleration of ions from a plasma onto a source material, in order to spatter molecules from that source onto the web of plastic film or flexible glass or metal foil.
- b) Using a beam of electrons to spatter molecules from a source material onto the web of plastic film or flexible glass or metal foil.
- c) **Using perovskites to enhance the conversion of solar energy into electricity in 3D printed solar panels.** **Your answer is correct**
- d) Employing chemically reactive gases to make microscopic holes and channels into the coatings.

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>304</b>
Avg. time spent on this question by all students	<b>354</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>345</b>
% of students who attempted this question	<b>51.39</b>
% of students who got the question right of those who attempted	<b>84.09</b>

[Video Solution](#)

## Text Solution

### **Number of words and Explanatory notes for RC:**

Number of words: 735

At a factory in Accrington, Britain, a company Emerson & Renwick has expanded beyond its formative business of making wallpaper-printing equipment. A new machine "Genesis" has been designed to coat and print electrical devices. It puts sequential coatings onto webs (long rolls) of material such as plastic film, flexible glass and metal foil.

Option A: Emerson & Renwick produces special carts, which are wheeled into the printing system to configure it for different applications. Some carts contain equipment that accelerates ions from a plasma onto a source material, to spatter molecules from that source onto the web, allowing printing at the atomic scale. Choice A is true and is not the answer.

Option B: Others perform a similar trick using a beam of electrons. Choice B is true and is not the answer.

Option C: Choice C is not a specific feature of the special carts employed by Emerson and Renwick in their printing machine in Accrington, Britain. Several other groups are working with a family of crystalline materials called perovskites in roll-to-roll printing to make thin-film solar panels. Choice C is the required answer.

Option D: Others employ chemically reactive gases to etch features such as holes and channels less than 50 nanometres across into the coatings, for electrical connections. Choice D is true and is not the answer.

Choice (C)

undefined

**DIRECTIONS for questions 11 to 16:** The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

At a factory in Accrington, Britain, a company Emerson & Renwick has expanded beyond its formative business of making wallpaper/newspaper-printing equipment. A new machine "Genesis" has been designed to coat and print electrical devices. Like a conventional printer, it puts sequential coatings onto webs (long rolls) of material such as plastic film, flexible glass and metal foil. The printed items are then cut out and used in various products.

Emerson & Renwick produces special carts which are wheeled into the printing system to configure it for different applications. Some carts contain equipment that accelerates ions from a plasma onto a source material, to spatter molecules from that source onto the web, allowing printing at the atomic scale. Others perform a similar trick using a beam of electrons. Others employ chemically reactive gases to etch features such as holes and channels less than 50 nanometres across into the coatings, for electrical connections.

The underlying technologies of the Genesis machine are similar to those found in a conventional graphics press. Careful management of the web through its winding, tension and control is essential. A break in the web, as any newspaperman knows, brings production to a time-consuming and expensive halt and could damage a whole reel.

Printing electronics requires special formulations of ink. Often, these are made with silver which is expensive. An alternative, being worked on by Tawfique Hasan at Cambridge University, is to include flakes of graphene in such inks which reduces the cost drastically. Another idea he is exploring is "smart" wallpaper. In addition to graphene ink, this uses either organic light-emitting diodes (OLEDs) or quantum dots – crystals of semiconducting material. These emit light when excited by electricity, so wall coverings printed with such materials could be used to illuminate rooms.

Several groups are working on making thin-film solar panels using printed electronics. A family of crystalline materials called perovskites is attracting interest for roll-to-roll printing. Whereas the best conventionally made silicon-based solar panels convert the energy in sunlight into electricity with an efficiency of 20%, researchers in California, think they can push that to 31% using perovskites. Being small, crystalline grains, perovskites make ideal ingredients of ink.

Inkjet printing is also getting a roll-to-roll makeover, according to David Bird of the Centre for Process Innovation (CPI), Britain. Inkjet printers are not particularly fast, but they are parsimonious, for they spray ink only where it is needed. They are flexible and easily customised. To alter what is being printed requires only a software reload, rather than the changing of a printing plate. And lack of speed is relative. The CPI's inkjet machine can print copper circuits onto rolls of plastic at a rate of 17 metres a minute. These circuits are used for sensors and radio antennae. Like inkjet printers, 3D printers – which can also print electronics – are flexible, but they build things one at a time or in small batches and are mostly used to print larger objects. ....

Single-sheet or batch production permits an error to be spotted before it is repeated, but high-speed roll-to-roll systems can churn out a lot of waste if there is any delay in identifying problems. Cameras can be used to detect errors in printed text or graphics, but they are not much help at spotting faults in microscopic layers of transparent material whizzing past on a web. Researchers at CPI have come up with a method that builds a three-dimensional model of the web's surface using reflected light, and can raise the alarm if it detects depressions that might indicate an uncoated spot.

At present printed electronic products tend to be used as components rather than complete systems. The technology is a long way from being able to roll-print powerful computer chips, which contain several billion transistors squeezed onto a tiny piece of silicon. These processors are currently made in batches in costly semiconductor fabrication plants.

Using roll-to-roll systems to print lots of transistors in the form of a processor is nevertheless an attractive proposition. Ma Zhenqiang of the University of Wisconsin-Madison and his colleagues recently fabricated a flexible transistor that operates at 110 gigahertz. Dr Ma used an electron beam to etch shapes just ten nanometres wide in a mould that was then employed to form the transistor's circuitry in an ultra-thin

flexible silicon membrane. As the mould can be reused, Dr Ma reckons his method could easily be scaled up for roll-to-roll processing.

**Q12. What can be understood about inkjet printing from the passage?**

- a) In Inkjet printing, cartridges deposit layers of a liquid polymer which are cured by UV light.
- b) The CPI's inkjet machine uses multiple cartridges to print sensors, radio antennae and copper circuits in 36000 different colours and any combination of 6 different materials, which can be rigid or flexible, opaque or transparent.
- c) **Inkjet printing is flexible, easily customised but they build things one at a time or in small batches and are mostly used to print larger objects.**
- d) **Inkjet printing is flexible, easily customised, sparing in the use of inks and requires only software reboot rather than hardware change to alter what is being printed.** Your answer is correct

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>125</b>
Avg. time spent on this question by all students	<b>146</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>142</b>
% of students who attempted this question	<b>52.05</b>
% of students who got the question right of those who attempted	<b>78.92</b>

[Video Solution](#)

[\*\*Text Solution\*\*](#)

**Number of words and Explanatory notes for RC:**

Number of words: 735

Refer to the sixth para.

Option A: Choice A has not been mentioned in the passage and can be eliminated.

Option B: The CPI's inkjet machine can print copper circuits onto rolls of plastic at a rate of 17 metres a minute. These circuits are used for things like sensors and radio antennae. But "36000 different colours and any combination of 6 different materials" has not been mentioned. Choice B is out of scope.

Option C: Like inkjet printers, 3D printers are flexible, but they build things one at a time or in small batches and are mostly used to print larger objects. So the latter half of choice C is true of 3D printers and not inkjet printers. Choice C is not the answer.

Option D: Inkjet printers are "flexible and easily customised." "To alter what is being printed requires only a software reload." Choice D is the correct answer.

Choice (D)

undefined

**DIRECTIONS for questions 11 to 16:** The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

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Single-sheet or batch production permits an error to be spotted before it is repeated, but high-speed roll-to-roll systems can churn out a lot of waste if there is any delay in identifying problems. Cameras can be used to detect errors in printed text or graphics, but they are not much help at spotting faults in microscopic layers of transparent material whizzing past on a web. Researchers at CPI have come up with a method that builds a three-dimensional model of the web's surface using reflected light, and can raise the alarm if it detects depressions that might indicate an uncoated spot.

At present printed electronic products tend to be used as components rather than complete systems. The technology is a long way from being able to roll-print powerful computer chips, which contain several billion transistors squeezed onto a tiny piece of silicon. These processors are currently made in batches in costly semiconductor fabrication plants.

Using roll-to-roll systems to print lots of transistors in the form of a processor is nevertheless an attractive proposition. Ma Zhenqiang of the University of Wisconsin-Madison and his colleagues recently fabricated a flexible transistor that operates at 110 gigahertz. Dr Ma used an electron beam to etch shapes just ten nanometres wide in a mould that was then employed to form the transistor's circuitry in an ultra-thin flexible silicon membrane. As the mould can be reused, Dr Ma reckons his method could easily be scaled up for roll-to-roll processing.

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**Q13.** According to the passage, which of the following can best resolve the problem of the detection of errors in printed circuits in the roll-to-roll systems used in the CPI's machines?

- a) Cameras can be employed for the same.
- b) **A 3D model of the web's surface can be created using light.** Your answer is correct
- c) Lasers can be used to illuminate microscopic layers of transparent material whizzing past on a web.
- d) OLEDs can be incorporated into the web material to detect any uncoated spot.

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>230</b>
Avg. time spent on this question by all students	<b>122</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>121</b>
% of students who attempted this question	<b>51.86</b>
% of students who got the question right of those who attempted	<b>85.8</b>

[Video Solution](#)

[Text Solution](#)

#### Number of words and Explanatory notes for RC:

Number of words: 735

Refer to the seventh para of the passage.

Option A: Cameras can be used to detect errors in printed text or graphics, but they are not much help at spotting faults in microscopic layers of transparent material whizzing past on a web. Choice A is not the answer.

Option B: Researchers have come up with a method that builds up a three-dimensional model of the web's surface using reflected light, and can raise the alarm if it detects depressions that might indicate an uncoated spot. Choice B is true and is the answer.

Option C: .... not much help at spotting faults in microscopic layers of transparent material whizzing past on a web. But the use of lasers to rectify the problem has not been mentioned in the passage.

Option D: OLEDs have been discussed in the passage in another application context.  
Choice D is not specific to the question. Choice (B)

**DIRECTIONS** for questions 11 to 16: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

At a factory in Accrington, Britain, a company Emerson & Renwick has expanded beyond its formative business of making wallpaper/newspaper-printing equipment. A new machine "Genesis" has been designed to coat and print electrical devices. Like a conventional printer, it puts sequential coatings onto webs (long rolls) of material such as plastic film, flexible glass and metal foil. The printed items are then cut out and used in various products.

Emerson & Renwick produces special carts which are wheeled into the printing system to configure it for different applications. Some carts contain equipment that accelerates ions from a plasma onto a source material, to spatter molecules from that source onto the web, allowing printing at the atomic scale. Others perform a similar trick using a beam of electrons. Others employ chemically reactive gases to etch features such as holes and channels less than 50 nanometres across into the coatings, for electrical connections.

The underlying technologies of the Genesis machine are similar to those found in a conventional graphics press. Careful management of the web through its winding, tension and control is essential. A break in the web, as any newspaperman knows, brings production to a time-consuming and expensive halt and could damage a whole reel.

Printing electronics requires special formulations of ink. Often, these are made with silver which is expensive. An alternative, being worked on by Tawfique Hasan at Cambridge University, is to include flakes of graphene in such inks which reduces the cost drastically. Another idea he is exploring is "smart" wallpaper. In addition to graphene ink, this uses either organic light-emitting diodes (OLEDs) or quantum dots – crystals of semiconducting material. These emit light when excited by electricity, so wall coverings printed with such materials could be used to illuminate rooms.

Several groups are working on making thin-film solar panels using printed electronics. A family of crystalline materials called perovskites is attracting interest for roll-to-roll printing. Whereas the best conventionally made silicon-based solar panels convert the energy in sunlight into electricity with an efficiency of 20%, researchers in California, think they can push that to 31% using perovskites. Being small, crystalline grains, perovskites make ideal ingredients of ink.

Inkjet printing is also getting a roll-to-roll makeover, according to David Bird of the Centre for Process Innovation (CPI), Britain. Inkjet printers are not particularly fast, but they are parsimonious, for they spray ink only where it is needed. They are flexible and easily customised. To alter what is being printed requires only a software reload, rather than the changing of a printing plate. And lack of speed is relative. The CPI's inkjet machine can print copper circuits onto rolls of plastic at a rate of 17 metres a minute. These circuits are used for sensors and radio antennae. Like inkjet printers, 3D printers – which can also print electronics – are flexible, but they build things one at a time or in small batches and are mostly used to print larger objects. ....

Single-sheet or batch production permits an error to be spotted before it is repeated, but high-speed roll-to-roll systems can churn out a lot of waste if there is any delay in identifying problems. Cameras can be used to detect errors in printed text or graphics, but they are not much help at spotting faults in microscopic layers of transparent material whizzing past on a web. Researchers at CPI have come up with a method that builds a three-dimensional model of the web's surface using reflected light, and can raise the alarm if it detects depressions that might indicate an uncoated spot.

At present printed electronic products tend to be used as components rather than complete systems. The technology is a long way from being able to roll-print powerful computer chips, which contain several billion transistors squeezed onto a tiny piece of silicon. These processors are currently made in batches in costly semiconductor fabrication plants.

Using roll-to-roll systems to print lots of transistors in the form of a processor is nevertheless an attractive proposition. Ma Zhenqiang of the University of Wisconsin-Madison and his colleagues recently fabricated a flexible transistor that operates at 110 gigahertz. Dr Ma used an electron beam to etch shapes just ten nanometres wide in a mould that was then employed to form the transistor's circuitry in an ultra-thin flexible silicon membrane. As the mould can be reused, Dr Ma reckons his method could easily be scaled up for roll-to-roll processing.

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**Q14.** Which of the following can best complete the last para of the passage?

- a) People come in all shapes and sizes, so the ability of a 3D printer to offer customised production is a boon.
- b) **Printing with conventional rotary presses will create cheaper electronics.**
- c) **Printed media may be going out of style, then, but it looks as if their electronic replacements will still require the presses to roll.** Your answer is correct
- d) How far printed electronics will go remains to be seen.

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>119</b>
Avg. time spent on this question by all students	<b>115</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>118</b>
% of students who attempted this question	<b>36.76</b>
% of students who got the question right of those who attempted	<b>31.81</b>

[Video Solution](#)

## Text Solution

### **Number of words and Explanatory notes for RC:**

Number of words: 735

Option A: The last para talks about using the conventional roll-to-roll systems to print many transistors. Choice A runs tangent to the text by talking about 3D printers offering customised production. Also "People come in all shapes and sizes" refers to a direct application to be used on people. Choice A cannot complete the last para of the passage.

Option B: This choice is close as "The mould can be reused" in the penultimate sentence of the last para draws attention. However, the last para does not discuss "expensive or costly products" vs "cheaper products". Choice B points to a less important feature and does not conclude or complete the last para of the passage. Also "conventional rotary presses" does not find a mention in the passage.

Option C: Choice C is the best sentence to complete the last para of the passage. In the passage, a comparison has been made between the new Genesis machine and conventional printing. (The underlying technologies of the Genesis machine are similar to those found in a conventional graphics press). The passage begins with "has expanded beyond its formative business of making wallpaper/newspaper-printing equipment". So "printed media" in choice D mirrors "wallpaper/newspaper" mentioned in the first sentence of the passage. The passage mentions the traditional "roll-to-roll" system at various points. The last para also mentions "Using roll-to-roll systems to print lots of transistors". So choice C best rhymes with the overall theme of the last two paras and also mirrors the introduction.

Option D: Choice D does not connect with the penultimate sentence of the last para of the passage. It can be placed at the beginning of the last but one para of the passage as it connects with the next sentence: At present printed electronic products tend to be used as components rather than complete systems. Choice D is not the correct answer.

Choice (C)

undefined

**DIRECTIONS for questions 11 to 16:** The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

At a factory in Accrington, Britain, a company Emerson & Renwick has expanded beyond its formative business of making wallpaper/newspaper-printing equipment. A new machine "Genesis" has been designed to coat and print electrical devices. Like a conventional printer, it puts sequential coatings onto webs (long rolls) of material such as plastic film, flexible glass and metal foil. The printed items are then cut out and used in various products.

Emerson & Renwick produces special carts which are wheeled into the printing system to configure it for different applications. Some carts contain equipment that accelerates ions from a plasma onto a source material, to spatter molecules from that source onto the web, allowing printing at the atomic scale. Others perform a similar trick using a beam of electrons. Others employ chemically reactive gases to etch features such as holes and channels less than 50 nanometres across into the coatings, for electrical connections.

The underlying technologies of the Genesis machine are similar to those found in a conventional graphics press. Careful management of the web through its winding, tension and control is essential. A break in the web, as any newspaperman knows, brings production to a time-consuming and expensive halt and could damage a whole reel.

Printing electronics requires special formulations of ink. Often, these are made with silver which is expensive. An alternative, being worked on by Tawfique Hasan at Cambridge University, is to include flakes of graphene in such inks which reduces the cost drastically. Another idea he is exploring is "smart" wallpaper. In addition to graphene ink, this uses either organic light-emitting diodes (OLEDs) or quantum dots – crystals of semiconducting material. These emit light when excited by electricity, so wall coverings printed with such materials could be used to illuminate rooms.

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**Q15.** All of the following current limitations of various systems or processes have been discussed in the passage EXCEPT?

- a) A web-break in the Genesis printer employed by Emerson and Renwick is potentially catastrophic as it could damage a whole reel.
- b) **High speed roll-to-roll systems can churn out a lot of waste if there is delay in identifying issues.**
- c) **3D printers build things one at a time or in small batches.**
- d) **The mould used to print the transistor's circuitry in the roll-to-roll system employed by Dr Ma and colleagues etched shapes which were too wide for a flexible transistor and the technology is still in its early days.** Your answer is correct

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>148</b>
Avg. time spent on this question by all students	<b>106</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>105</b>
% of students who attempted this question	<b>46.95</b>
% of students who got the question right of those who attempted	<b>81.49</b>

[Video Solution](#)

[Text Solution](#)

#### Number of words and Explanatory notes for RC:

Number of words: 735

Option A: Careful management of the web through its winding, tension and control is essential. A break in the web, as any newspaperman knows, brings production to a time-consuming and expensive halt and could damage a whole reel (para 4). Choice A is correct and is not the answer.

Option B: Single-sheet or batch production permits an error to be spotted before it is repeated, but high-speed roll-to-roll systems can churn out a lot of waste if there is any delay in identifying problems (para 7). Choice B is true and is not the answer.

Option C: Like inkjet printers, 3D printers – which can also print electronics – are flexible, but they build things one at a time or in small batches and are mostly used to print larger objects. .... (para 6) Hence choice C is correct and is not the answer.

Option D: Ma Zhenqiang of the University of Wisconsin-Madison and his colleagues recently fabricated a flexible transistor that operates at 110 gigahertz – Dr Ma used an electron beam ... (last para). Choice D is not mentioned and is the answer to the question.

Choice (D)

undefined

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**Q16.** Who among the following has developed ways that could process not just circuits but also sophisticated electronic devices, such as thin-film transistors?

- a) Colin Hargreaves
- b) **Tawfique Hasan**
- c) **David Bird**
- d) **Ma Zhenqiang**

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>380</b>
Avg. time spent on this question by all students	<b>116</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>108</b>
% of students who attempted this question	<b>48.03</b>
% of students who got the question right of those who attempted	<b>85.25</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 735

Option A: Colin Hargreaves is the boss of Emerson and Renwick which does not specialize in printing circuits and sophisticated electronic devices, such as thin-film transistors. Choice A is not the answer.

Option B: Tawfique Hasan is credited with the incorporation of graphene and OLEDs in printing inks. Choice B is not the answer.

Option C: David Bird works at the CPI which specializes in "inkjet printing" (which is also getting a roll-to-roll makeover).

Option D: From the last para of the passage (Using roll-to-roll systems to print lots of transistors....), we know that Ma Zhenqiang recently fabricated a flexible transistor that operates at 110 gigahertz. Dr Ma used an electron beam to etch shapes just ten nanometres wide in a mould that was then employed to form the transistor's circuitry in an ultra-thin flexible silicon membrane. Choice D is the correct answer.

Choice (D)

undefined

**DIRECTIONS** for questions 17 to 19: The passage given below is accompanied by a set of three questions. Choose the best answer to each question.

For William Kochevar, the term "transformative technology" is justified. Though paralysed below the shoulders after a cycling accident, he manages to feed himself. This remarkable feat is partly thanks to electrodes, implanted in his right arm, which stimulate muscles. He can also control his arm using the power of thought. His intention to move is reflected in neural activity in his motor cortex; these signals are detected by implants in his brain and processed into commands to activate the electrodes in his arms. An ability to decode thought in this way may sound like science fiction. But brain-computer interfaces (BCIs) – direct communication pathways between an enhanced or wired brain and an external device – like the BrainGate system used by Mr Kochevar provide evidence that mind-control can work. By turning the firing of neurons into a resource to be harnessed, BCIs can change the idea of what it means to be human.

Beneath the skull lies the next frontier, thought, which can be used to control machines. The BrainGate system used by Mr Kochevar was developed more than ten years ago, but only a handful of people have tried it out. Taking medical BCIs out of the lab into clinical practice has proved very difficult. The path to the mainstream is blocked by three formidable barriers – technological, scientific and commercial.

Start with technology. Non-invasive techniques like an electroencephalogram (EEG) struggle to pick up high-resolution brain signals through intervening layers of skin, bone and membrane. Some advances are being made – on EEG caps that can be used to play virtual-reality games or control industrial robots using thought alone. But for the time being at least, the most ambitious applications require implants that can interact directly with neurons. And existing devices have lots of drawbacks. They involve wires that pass through the skull; they provoke immune responses; they communicate with only a few hundred of the 85bn neurons in the human brain.

Clear the technological barrier, and another one looms. The brain is still a foreign country. Scientists know little about how exactly it works, especially when it comes to complex functions like memory formation. Research is more advanced in animals, but experiments on humans are hard.

The third obstacle comprises the practical barriers to commercialisation. It takes time, money and expertise to get medical devices approved. And consumer applications will take off only if they perform a function people find useful. Some of the applications for brain-computer interfaces are unnecessary – a good voice-assistant is a simpler way to type without fingers than a brain implant, for example. The idea of consumers clamouring for craniotomies also seems far-fetched. A route to the future imagined by the neurotech pioneers is truly arduous.

**Q17.** Which of the following is an application that is least similar to the BCI application used by Mr Kochevar as can be inferred from the passage?

- a) Entrepreneurs envisage a world where thought-to-text typing is possible, where people can communicate telepathically, with each other and with machines.
- b) Over 300,000 people have cochlear implants, which help them hear by converting sound into electrical signals and sending them into the brain.

c) fMRI and PET scanners have now made it possible to understand how our brain functions through images produced by brain scans.

d) Futuristic goals include stimulating the visual cortex to help the blind, forging new neural connections in stroke victims and receiving deep-brain stimulation via electrodes to help patients control diseases.

You did not answer this question

Show Correct Answer

Time spent / Accuracy Analysis

Time taken by you to answer this question	7
Avg. time spent on this question by all students	293
Difficulty Level	D
Avg. time spent on this question by students who got this question right	283
% of students who attempted this question	28.84
% of students who got the question right of those who attempted	47.2

[Video Solution](#)

[Text Solution](#)

Number of words and Explanatory notes for RC:

Number of words: 448

Kochevar manages to feed himself thanks to electrodes, implanted in his right arm, which stimulate muscles. He can also control his arm using the power of thought. His intention to move is reflected in neural activity in his motor cortex; these signals are detected by implants in his brain and processed into commands to activate the electrodes in his arms.

An ability to decode thought in this way may sound like science fiction. But brain-computer interfaces (BCIs) – direct communication pathways between an enhanced or wired brain and an external device – like the BrainGate system used by Mr Kochevar provide evidence that mind-control can work.

Choices A, B and D point to an interaction between a wired brain and an external machine, thereby assisting, augmenting, or repairing human cognitive or sensory-motor functions. So choices A, B and D serve to exemplify brain-computer interface applications similar to the BrainGate system used by Mr Kochevar. (The system Kochevar uses has: Implants in the brain that pick up the brain activity, convert the activity into electronic commands, and thereby control electrodes elsewhere in the body and, if we extrapolate, elsewhere generally – appliances, machines etc.)

Choice C does not point to any application arising out of a brain-computer interaction and is the answer. fMRI and PET scanners help in improved measurements of brain activity but they do not exhibit any brain-computer interface applications similar to the BrainGate system used by Mr Kochevar.

Choice (C)

undefined

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For William Kochevar, the term “transformative technology” is justified. Though paralysed below the shoulders after a cycling accident, he manages to feed himself. This remarkable feat is partly thanks to electrodes, implanted in his right arm, which stimulate muscles. He can also control his arm using the power of thought. His intention to move is reflected in neural activity in his motor cortex; these signals are detected by implants in his brain and processed into commands to activate the electrodes in his arms. An ability to decode thought in this way may sound like science fiction. But brain-computer interfaces (BCIs) – direct communication pathways between an enhanced or wired brain and an external device – like the BrainGate system used by Mr Kochevar provide evidence that mind-control can work. By turning the firing of neurons into a resource to be harnessed, BCIs can change the idea of what it means to be human.

Beneath the skull lies the next frontier, thought, which can be used to control machines. The BrainGate system used by Mr Kochevar was developed more than ten years ago, but only a handful of people have tried it out. Taking medical BCIs out of the lab into clinical practice has proved very difficult. The path to the mainstream is blocked by three formidable barriers – technological, scientific and commercial.

Start with technology. Non-invasive techniques like an electroencephalogram (EEG) struggle to pick up high-resolution brain signals through intervening layers of skin, bone and membrane. Some advances are being made – on EEG caps that can be used to play virtual-reality games or control industrial robots using thought alone. But for the time being at least, the most ambitious applications require implants that can interact directly with neurons. And existing devices have lots of drawbacks. They involve wires that pass through the skull; they provoke immune responses; they communicate with only a few hundred of the 85bn neurons in the human brain.

Clear the technological barrier, and another one looms. The brain is still a foreign country. Scientists know little about how exactly it works, especially when it comes to complex functions like memory formation. Research is more advanced in animals, but experiments on humans are hard.

The third obstacle comprises the practical barriers to commercialisation. It takes time, money and expertise to get medical devices approved. And consumer applications will take off only if they perform a function people find useful. Some of the applications for brain-computer interfaces are unnecessary – a good voice-assistant is a simpler way to type without fingers than a brain implant, for example. The idea of consumers clamouring for craniotomies also seems far-fetched. A route to the future imagined by the neurotech pioneers is truly arduous.

**Q18.** Which of the following, if true, does not undermine the author's view "The brain is still a foreign country" with reference to the scientific barrier in opening up new application avenues for brain-computer interfaces?

- a) Today, many parts of the brain, like the motor cortex, are better understood and neurotechnology has revealed most of the brain's secrets.
- b) **Turning implants into consumer products is hard to imagine with the current technology.**
- c) **Complete knowledge of the brain is not always needed and BCIs can open the door to remarkable new applications even before the important mysteries of the brain are unravelled.**
- d) **Machine learning has been used to map significant portions of neural activity and the brain itself gets the hang of controlling BCIs with extraordinary ease.**

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>3</b>
Avg. time spent on this question by all students	<b>116</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>110</b>
% of students who attempted this question	<b>27.55</b>
% of students who got the question right of those who attempted	<b>45.65</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 448

Refer to para 4. Clear the technological barrier, and another one looms – the scientific barrier. The brain is still a foreign country. Scientists know little about how exactly it works, especially when it comes to complex functions like memory formation.

Option A: Choice A, if true, will undermine the author's view "The brain is still a foreign country". If neurotechnology has revealed most of the brain's secrets, it would be so much better for the fantastic applications of BCIs to become real. Choice A is not the answer.

Option B: Choice B is not related to the second barrier – the scientific barrier to the realization of BCI's promises. It hints at practical barriers to commercialisation due to limitations in the BCI technology. Choice B does not undermine the author's view "The brain is still a foreign country" with reference to the scientific barrier to BCI applications. Choice B is the answer.

Option C: Scientists know little about how exactly the brain works, especially when it comes to complex functions like memory formation. Research is more advanced in animals, but experiments on humans are hard. If choice C is true, then it will weaken the author's view "The brain is still a foreign country" and nullify the impact of the so-called scientific barrier to BCI application.

Option D: If choice D is true, then it will weaken the author's view "The brain is still a foreign country" with reference to the scientific barrier in opening up new application avenues for brain-computer interfaces. Choice D is not the answer.

Choice (B)

undefined

**DIRECTIONS** for questions 17 to 19: The passage given below is accompanied by a set of three questions. Choose the best answer to each question.

For William Kochevar, the term "transformative technology" is justified. Though paralysed below the shoulders after a cycling accident, he manages to feed himself. This remarkable feat is partly thanks to electrodes, implanted in his right arm, which stimulate muscles. He can also control his arm using the power of thought. His intention to move is reflected in neural activity in his motor cortex; these signals are detected by implants in his brain and processed into commands to activate the electrodes in his arms. An ability to decode thought in this way may sound like science fiction. But brain-computer interfaces (BCIs) – direct communication pathways between an enhanced or wired

brain and an external device – like the BrainGate system used by Mr Kochevar provide evidence that mind-control can work. By turning the firing of neurons into a resource to be harnessed, BCIs can change the idea of what it means to be human.

Beneath the skull lies the next frontier, thought, which can be used to control machines. The BrainGate system used by Mr Kochevar was developed more than ten years ago, but only a handful of people have tried it out. Taking medical BCIs out of the lab into clinical practice has proved very difficult. The path to the mainstream is blocked by three formidable barriers – technological, scientific and commercial.

Start with technology. Non-invasive techniques like an electroencephalogram (EEG) struggle to pick up high-resolution brain signals through intervening layers of skin, bone and membrane. Some advances are being made – on EEG caps that can be used to play virtual-reality games or control industrial robots using thought alone. But for the time being at least, the most ambitious applications require implants that can interact directly with neurons. And existing devices have lots of drawbacks. They involve wires that pass through the skull; they provoke immune responses; they communicate with only a few hundred of the 85bn neurons in the human brain.

Clear the technological barrier, and another one looms. The brain is still a foreign country. Scientists know little about how exactly it works, especially when it comes to complex functions like memory formation. Research is more advanced in animals, but experiments on humans are hard.

The third obstacle comprises the practical barriers to commercialisation. It takes time, money and expertise to get medical devices approved. And consumer applications will take off only if they perform a function people find useful. Some of the applications for brain-computer interfaces are unnecessary – a good voice-assistant is a simpler way to type without fingers than a brain implant, for example. The idea of consumers clamouring for craniotomies also seems far-fetched. A route to the future imagined by the neurotech pioneers is truly arduous.

**Q19.** Which of the following, if true, can help overcome the “technological barrier” discussed in the passage?

- (a) Access to superhuman cognitive abilities will be granted to people of all backgrounds and not only to the elite.
- (b) Helped by advances in miniaturisation and increased computing power, efforts are under way to make safe, wireless implants that can communicate with hundreds of thousands of neurons.
- (c) Given the advances in computational science, newer non-invasive technologies that can interpret the brain's electrical signals better than the existing ones will soon be developed.

a) a, b and c

b) a and b

c) a and c

d) b and c

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>2</b>
Avg. time spent on this question by all students	<b>100</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>98</b>
% of students who attempted this question	<b>28.24</b>
% of students who got the question right of those who attempted	<b>83.93</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 448

Statement (a): Statement (a) (Access to superhuman cognitive abilities) is not related to the technological barrier to the complete realization of BCI's potential. (a) is incorrect.

Statement (b): The most ambitious BCI applications require implants that can interact directly with neurons. And existing devices have lots of drawbacks. They involve wires that pass through the skull; they provoke immune responses; they communicate with only a few hundred of the 85bn neurons in the human brain. So wireless implants can counter this problem. Statement (b) is correct.

Statement (c): Start with the technology barrier. Non-invasive techniques (existing technology) like an electroencephalogram (EEG) struggle to pick up high-resolution brain signals through intervening layers of skin, bone and membrane. Some advances are being made – on EEG caps that can be used to play virtual-reality games or control industrial robots using thought alone. If statement (c) is true, then it will enhance the technological aspects of BCI and lessen the impact of the technological barrier discussed in para 3 of the passage.

So, both (b) and (c) apply.

Choice (D)

undefined

**DIRECTIONS** for questions 20 to 25: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Consider two tribes: the Yanomamo, a stone-tool-making hunter-gatherer tribe living along the Orinoco River on the remote border of Brazil and Venezuela and second, the New Yorkers, a cell-phone-talking, café-latte-drinking tribe living along the Hudson River on the border of New York and New Jersey. Both tribes share the same thirty thousand or so genes that all humans do and thus, in terms of biology and innate intelligence are essentially identical. Yet, the lifestyle of the latter is vastly different from the former, who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond *one*, *two*, and *many*. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.

To summarise 2.5 million years of economic history in brief: for a very, very long time not much happened; then all of a sudden, all hell broke loose. It took 99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750, and then just 0.01 percent for global wealth to leap to the levels of the modern world. Another way to think of it is that over 97 percent of humanity's wealth was created in just the last 0.01 percent of our history. As the economic historian David Landes describes it, 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grandchildren.'

How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way? And, why does there appear to be a correlation between the complexity of an economy and its wealth? Why has the growth in wealth and complexity been sudden and explosive rather than smooth?

Any theory that seeks to explain what wealth is and how it is created must answer these questions. While we know the historical narrative of what has happened for example, the advent of settled agriculture, the Industrial Revolution, and so on, we still need a theory of how and why it happened. Modern science provides just such a theory. Wealth creation is the product of a simple, but profoundly powerful, three-step formula – differentiate, select, and amplify – the formula for evolution. The same process that has driven the growing order and complexity of the biosphere has driven the growing order and complexity of the 'econosphere'.

We are accustomed to thinking of evolution in a biological context, but modern evolutionary theory views evolution as something much more general – evolution is an algorithm; it is an all-purpose formula for innovation, a formula that through its special brand of trial and error, creates new designs and solves difficult problems. Evolution can perform its tricks not just in the substrate of DNA but in any system that has the right information processing and information-storage characteristics. In short, evolution's simple recipe of 'differentiate, select, and amplify' is a type of computer program to create novelty, knowledge, and growth.

Economics and evolutionary theory have a long history together, and one of its criticisms is that there has been too much analogizing about how the economy might be like an evolutionary system. For example, one might say that computer industry is like an ecological niche, with different species of players such as chip designer, hard-drive manufacturers, software providers, and so on, engaged in a 'survival of the fittest' struggle. Paul Krugman calls such metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating.

If the economy is truly an evolutionary system, and there are general laws of the latter, then it follows that there are general laws of economics – a controversial notion for many. Saying that there are laws of economics doesn't imply that we will ever be able to make perfect predictions about the economy, but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today. It also means that economics in the future may be able to make prescriptive recommendations about business and public policy.

**Q20.** Which of the following best represents the 'biobabble' referred to by Paul Krugman?

- a) Chip designers, hard-drive manufacturers, and software providers engaged in a 'survival of the fittest' struggle.
- b) **The metaphorical description of the computer industry as an ecological chamber evolving on its own.**
- c) **The metaphorical parallels drawn between economic and evolutionary systems.**
- d) **Any comparison between economic and biological systems which cannot be classified as good science.**

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>20</b>
Avg. time spent on this question by all students	<b>375</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>380</b>
% of students who attempted this question	<b>41.05</b>
% of students who got the question right of those who attempted	<b>35.66</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 757

The term 'biobabble' is a sarcastic term used by Paul Krugman for comparisons drawn between economic systems and biological systems. For example, the 'survival of the fittest' analogy used for the computer industry is something Krugman doesn't approve of because it doesn't serve much purpose. We can get the answer from 'one of its **criticisms** is that there has been **too much analogizing** about how the **economy** might be **like an evolutionary system**' and 'Paul Krugman calls **such** metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating.'

Option A: While being a close option, one should note that this is one instance of biobabble and not the 'biobabble' itself. Krugman calls **such comparisons** biobabble. There could be many like these. So, the question asks for a general theory of what biobabble might be and this option could give the indication that only this comparison satisfies that term. Hence, A is not the answer.

Option B: Firstly, from the information above, it is hard to conclude that the computer industry is an ecological chamber of its own, cut off from other entities. The comparisons are between the computer industry and a biological/evolutionary system and not about computer industry being a chamber of its own. In other words, the 'biobabble' is **linking** the industry to something else and not **isolating** it. Hence, B is not the answer.

Option C: The term 'parallels' is similar to 'analogizing' and 'metaphorical comparisons', terms used by the author in the para under consideration. 'Biobabble' is the comparison of economic systems with evolutionary/biological systems needlessly (babble is meaningless talk). So, this option represents it well. Hence, C is the answer.

Option D: From 'Paul Krugman calls **such** metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating' we can understand that biobabble is not good science. However, the given option seems to suggest that there might be comparisons between economic and biological systems which could be classified as good science. In fact, the word 'science' here is not even literary, and only refers to the fact that such a comparison (between economic and biological systems) is not logical. There is no objective way of defining what qualifies as a good science. So, D doesn't represent the best description of 'biobabble'. Therefore, Option D is not the answer.

Choice (C)

undefined

**DIRECTIONS** for questions 20 to 25: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Consider two tribes: the Yanomamo, a stone-tool-making hunter-gatherer tribe living along the Orinoco River on the remote border of Brazil and Venezuela and second, the New Yorkers, a cell-phone-talking, café-latte-drinking tribe living along the Hudson River on the border of New York and New Jersey. Both tribes share the same thirty thousand or so genes that all humans do and thus, in terms of biology and innate intelligence are essentially identical. Yet, the lifestyle of the latter is vastly different from the former, who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond *one*, *two*, and *many*. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.

To summarise 2.5 million years of economic history in brief: for a very, very long time not much happened; then all of a sudden, all hell broke loose. It took 99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750, and then just 0.01 percent for global wealth to leap to the levels of the modern world. Another way to think of it is that over 97 percent of humanity's wealth was created in just the last 0.01 percent of our history. As the economic historian David Landes describes it, 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grandchildren.'

How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way? And, why does there appear to be a correlation between the complexity of an economy and its wealth? Why has the growth in wealth and complexity been sudden and explosive rather than smooth?

Any theory that seeks to explain what wealth is and how it is created must answer these questions. While we know the historical narrative of what has happened for example, the advent of settled agriculture, the Industrial Revolution, and so on, we still need a theory of how and why it happened. Modern science provides just such a theory. Wealth creation is the product of a simple, but profoundly powerful, three-step formula – differentiate, select, and amplify – the formula for evolution. The same process that has driven the growing order and complexity of the biosphere has driven the growing order and complexity of the 'econosphere'.

We are accustomed to thinking of evolution in a biological context, but modern evolutionary theory views evolution as something much more general – evolution is an algorithm; it is an all-purpose formula for innovation, a formula that through its special brand of trial and error,

creates new designs and solves difficult problems. Evolution can perform its tricks not just in the substrate of DNA but in any system that has the right information processing and information-storage characteristics. In short, evolution's simple recipe of 'differentiate, select, and amplify' is a type of computer program to create novelty, knowledge, and growth.

Economics and evolutionary theory have a long history together, and one of its criticisms is that there has been too much analogizing about how the economy might be like an evolutionary system. For example, one might say that computer industry is like an ecological niche, with different species of players such as chip designer, hard-drive manufacturers, software providers, and so on, engaged in a 'survival of the fittest' struggle. Paul Krugman calls such metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating.

If the economy is truly an evolutionary system, and there are general laws of the latter, then it follows that there are general laws of economics – a controversial notion for many. Saying that there are laws of economics doesn't imply that we will ever be able to make perfect predictions about the economy, but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today. It also means that economics in the future may be able to make prescriptive recommendations about business and public policy.

**Q21.** Which of the following are not assumptions made by the author in the last para of the passage?

- I. If there exist general laws, it will help in a deeper understanding of phenomena.
  - II. We do not have a good understanding of economic phenomena currently.
  - III. The existence of laws doesn't necessarily make a system predictable.
- 
- a) Only I and II
  - b) **Only II**
  - c) **Only II and III**
  - d) **Only III**

You did not answer this question

Show Correct Answer

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	11
Avg. time spent on this question by all students	146
Difficulty Level	D
Avg. time spent on this question by students who got this question right	148
% of students who attempted this question	38.85
% of students who got the question right of those who attempted	36.4

[Video Solution](#)

#### Text Solution

##### Number of words and Explanatory notes for RC:

Number of words: 757

- I. If there exist general laws, it will help in a deeper understanding of phenomena.
- II. We do not have a good understanding of economic phenomena currently.
- III. The existence of laws doesn't necessarily make a system predictable.

From the statement 'but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today' – the author is hopeful that there will be deeper understanding of economic phenomena. The author could have arrived at the conclusion only if the author assumes that laws help us get a deeper understanding of phenomena. If this assumption is negated (laws don't help us understand phenomena better) then the given conclusion of the author is not possible (which is the test for assumption. Negate it and the conclusion gets negated). Hence, I is an assumption.

The author says we will have a deeper understanding of the economic phenomena if there were indeed general laws of economics. That doesn't in any way indicate the absence of understanding now. ***It will only be better***. Hence, II is not an assumption. From 'Saying that there are laws of economics doesn't imply that we will ever be able to make perfect predictions about the economy' – the author warns that ***laws do not imply we can make perfect predictions***. This conclusion of the author could be arrived at only if the author assumes that the ***presence of laws doesn't necessarily guarantee the predictability of a system***. If the system was indeed predictable, the laws would have helped make predictions. III is therefore, an assumption.

Therefore, I and III are assumptions, but II isn't. Hence, choice B is the answer.

Choice (B)

**DIRECTIONS** for questions 20 to 25: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Consider two tribes: the Yanomamo, a stone-tool-making hunter-gatherer tribe living along the Orinoco River on the remote border of Brazil and Venezuela and second, the New Yorkers, a cell-phone-talking, café-latte-drinking tribe living along the Hudson River on the border of New York and New Jersey. Both tribes share the same thirty thousand or so genes that all humans do and thus, in terms of biology and innate intelligence are essentially identical. Yet, the lifestyle of the latter is vastly different from the former, who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond *one*, *two*, and *many*. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.

To summarise 2.5 million years of economic history in brief: for a very, very long time not much happened; then all of a sudden, all hell broke loose. It took 99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750, and then just 0.01 percent for global wealth to leap to the levels of the modern world. Another way to think of it is that over 97 percent of humanity's wealth was created in just the last 0.01 percent of our history. As the economic historian David Landes describes it, 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grandchildren.'

How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way? And, why does there appear to be a correlation between the complexity of an economy and its wealth? Why has the growth in wealth and complexity been sudden and explosive rather than smooth?

Any theory that seeks to explain what wealth is and how it is created must answer these questions. While we know the historical narrative of what has happened for example, the advent of settled agriculture, the Industrial Revolution, and so on, we still need a theory of how and why it happened. Modern science provides just such a theory. Wealth creation is the product of a simple, but profoundly powerful, three-step formula – differentiate, select, and amplify – the formula for evolution. The same process that has driven the growing order and complexity of the biosphere has driven the growing order and complexity of the 'econosphere'.

We are accustomed to thinking of evolution in a biological context, but modern evolutionary theory views evolution as something much more general – evolution is an algorithm; it is an all-purpose formula for innovation, a formula that through its special brand of trial and error, creates new designs and solves difficult problems. Evolution can perform its tricks not just in the substrate of DNA but in any system that has the right information processing and information-storage characteristics. In short, evolution's simple recipe of 'differentiate, select, and amplify' is a type of computer program to create novelty, knowledge, and growth.

Economics and evolutionary theory have a long history together, and one of its criticisms is that there has been too much analogizing about how the economy might be like an evolutionary system. For example, one might say that computer industry is like an ecological niche, with different species of players such as chip designer, hard-drive manufacturers, software providers, and so on, engaged in a 'survival of the fittest' struggle. Paul Krugman calls such metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating.

If the economy is truly an evolutionary system, and there are general laws of the latter, then it follows that there are general laws of economics – a controversial notion for many. Saying that there are laws of economics doesn't imply that we will ever be able to make perfect predictions about the economy, but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today. It also means that economics in the future may be able to make prescriptive recommendations about business and public policy.

**Q22.** Which of the following explains the author's purpose in quoting what the historian David Landes said: 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grandchildren'?

- a) To show that Englishmen of the 18<sup>th</sup> century were more attached to material things than the present generation.
- b) To demonstrate that while Englishmen were descendants of Caesar's troops, they're utterly different.
- c) To highlight that not all Englishmen have managed to uncouple themselves from history and modernise themselves.
- d) To indicate that more economic advancement has taken place during recent times than in all the time before that. Your answer is correct

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	31
Avg. time spent on this question by all students	86
Difficulty Level	E
Avg. time spent on this question by students who got this question right	78
% of students who attempted this question	38.07
% of students who got the question right of those who attempted	78.88

[Video Solution](#)

## Text Solution

### **Number of words and Explanatory notes for RC:**

Number of words: 757

The quote was used to strengthen the first line of the same para where the author summarises thus: 'To summarise 2.5 million years of economic history in brief: for a very, very long time not much happened; then all of a sudden, all hell broke loose'. The author then proceeds to give numbers and explain that for a long time there was very little evolution/change/diversification in 'material things' and then a lot happened in a very short time. That is why someone in the 18<sup>th</sup> century (A) is more likely to be similar to Caesar's troops (B) more than 1500 years ago than to their great-grand-children (C), three generations later, given how many material things have been developed during this time. You are not expected to know history and when Caesar was alive. The tone of the line irrespective of when Caesar was alive or who he was is to indicate A was closer to B than to C. Now A is expected to be close to C (great-grandchildren), but that is the point of the quote, that A is closer to B than C, thus indirectly indicating that B is a far-off event.

Option A: The comparison is in terms of the sophistication of material things and how someone in the 18<sup>th</sup> century wouldn't be too far off in sophistication from Caesar's time (whenever that was) but will be far off from the material (ownership of things/technology/etc.) things three generations later. The comparison is not about 'attachment' to material things. Hence, choice A is not the answer.

Option B: The Englishmen were NOT descendants of Caesar's troops. This cannot be inferred in any way from the words 'closer in material things'. Hence, choice B is not the answer.

Option C: This line seems to indicate that one cannot proceed towards modernisation unless they uncouple themselves from history. Firstly, there is nothing to indicate that the Englishman is coupled to history. 'Closer to material things' is more a comparison of the material advancement of civilization and not about whether one is coupled to history or not. Secondly, the line in the passage is a linear comparison of how much advancement has happened since 1750 and in no way, does it seem to divide one side as history and another side as modernisation. Hence, choice C is not the answer.

Option D: From 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grand-children', we can understand that in terms of material advancement, the Englishman of 1750 wouldn't be too far ahead or away from Caesar's troops (probably from a distant past) but will be quite far from his great-grandchildren's generation. Hence, this line explains the author's purpose in using the quote – to draw the parallel and show how much advancement has taken place in a short span of time since 1750. It must be noted that the focus is on material wealth of the eras and the usage of the word Englishman is just as an example, not to conclude that only Englishmen have done well in terms of material gains. The quote indicates that more material diversification has taken place during recent times (since 1750) than several hundreds of years (from the time of Caesar's legionnaires to 1750) before that. Hence, choice D is the answer.

Choice (D)

undefined

**DIRECTIONS** for questions 20 to 25: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Consider two tribes: the Yanomamo, a stone-tool-making hunter-gatherer tribe living along the Orinoco River on the remote border of Brazil and Venezuela and second, the New Yorkers, a cell-phone-talking, café-latte-drinking tribe living along the Hudson River on the border of New York and New Jersey. Both tribes share the same thirty thousand or so genes that all humans do and thus, in terms of biology and innate intelligence are essentially identical. Yet, the lifestyle of the latter is vastly different from the former, who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond *one*, *two*, and *many*. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.

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How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way? And, why does there appear to be a correlation between the complexity of an economy and its wealth? Why has the growth in wealth and complexity been sudden and explosive rather than smooth?

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formula – differentiate, select, and amplify – the formula for evolution. The same process that has driven the growing order and complexity of the biosphere has driven the growing order and complexity of the ‘econosphere’.

We are accustomed to thinking of evolution in a biological context, but modern evolutionary theory views evolution as something much more general – evolution is an algorithm; it is an all-purpose formula for innovation, a formula that through its special brand of trial and error, creates new designs and solves difficult problems. Evolution can perform its tricks not just in the substrate of DNA but in any system that has the right information processing and information-storage characteristics. In short, evolution’s simple recipe of ‘differentiate, select, and amplify’ is a type of computer program to create novelty, knowledge, and growth.

Economics and evolutionary theory have a long history together, and one of its criticisms is that there has been too much analogizing about how the economy might be like an evolutionary system. For example, one might say that computer industry is like an ecological niche, with different species of players such as chip designer, hard-drive manufacturers, software providers, and so on, engaged in a ‘survival of the fittest’ struggle. Paul Krugman calls such metaphorical comparisons of economic and biological systems ‘biobabble’, which is neither good science nor very illuminating.

If the economy is truly an evolutionary system, and there are general laws of the latter, then it follows that there are general laws of economics – a controversial notion for many. Saying that there are laws of economics doesn’t imply that we will ever be able to make perfect predictions about the economy, but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today. It also means that economics in the future may be able to make prescriptive recommendations about business and public policy.

**Q23.** Which of the following is NOT a question that needs to be answered by a theory that seeks to explain what wealth is?

- a) Why has there been an exponential growth in wealth in the last 0.01 percent of history?
- b) **Why is wealth proportional to the complexity of an economy?**
- c) **How does the three-step formula of differentiate, select and amplify help create wealth?**
- d) **How does the economy work in a structurally organised way despite its complexity?**

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	41
Avg. time spent on this question by all students	98
Difficulty Level	M
Avg. time spent on this question by students who got this question right	101
% of students who attempted this question	33.37
% of students who got the question right of those who attempted	55.76

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 757

How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way?

And, why does there appear to be a correlation between the complexity of an economy and its wealth?

Why has the growth in wealth and complexity been sudden and explosive rather than smooth? Any theory that seeks to explain what wealth is and how it is created must answer these questions. These are the three questions that need to be answered.

Option A: This is the third question. Why has the growth in wealth been so exponential (explosive)? The inferred time frame of this growth is in the same para as the author highlights that 97percent of humanity's wealth was created in the last 0.01 percent of its history. Hence, choice A is not the answer.

Option B: This is the second question - why is there a correlation (proportionality) between complexity of economy and wealth. Hence, choice B is not the answer.

Option C: According to the passage, modern science provides one theory which is based on the ‘three-step formula’. However, any theory which seeks to explain what wealth is need not talk about the three-step formula. Hence, this is the correct answer.

Option D: How can something as complex and structured as the economy work in a self-organised way was the first question that must be answered by the theory according to the author. This has been rephrased as, ‘How does the economy work in a structurally organised way despite its complexity?’ Hence, choice D is one of the questions and hence, is not the answer.

Choice (C)

**DIRECTIONS** for questions 20 to 25: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Consider two tribes: the Yanomamo, a stone-tool-making hunter-gatherer tribe living along the Orinoco River on the remote border of Brazil and Venezuela and second, the New Yorkers, a cell-phone-talking, café-latte-drinking tribe living along the Hudson River on the border of New York and New Jersey. Both tribes share the same thirty thousand or so genes that all humans do and thus, in terms of biology and innate intelligence are essentially identical. Yet, the lifestyle of the latter is vastly different from the former, who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond *one*, *two*, and *many*. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.

To summarise 2.5 million years of economic history in brief: for a very, very long time not much happened; then all of a sudden, all hell broke loose. It took 99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750, and then just 0.01 percent for global wealth to leap to the levels of the modern world. Another way to think of it is that over 97 percent of humanity's wealth was created in just the last 0.01 percent of our history. As the economic historian David Landes describes it, 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grandchildren.'

How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way? And, why does there appear to be a correlation between the complexity of an economy and its wealth? Why has the growth in wealth and complexity been sudden and explosive rather than smooth?

Any theory that seeks to explain what wealth is and how it is created must answer these questions. While we know the historical narrative of what has happened for example, the advent of settled agriculture, the Industrial Revolution, and so on, we still need a theory of how and why it happened. Modern science provides just such a theory. Wealth creation is the product of a simple, but profoundly powerful, three-step formula – differentiate, select, and amplify – the formula for evolution. The same process that has driven the growing order and complexity of the biosphere has driven the growing order and complexity of the 'econosphere'.

We are accustomed to thinking of evolution in a biological context, but modern evolutionary theory views evolution as something much more general – evolution is an algorithm; it is an all-purpose formula for innovation, a formula that through its special brand of trial and error, creates new designs and solves difficult problems. Evolution can perform its tricks not just in the substrate of DNA but in any system that has the right information processing and information-storage characteristics. In short, evolution's simple recipe of 'differentiate, select, and amplify' is a type of computer program to create novelty, knowledge, and growth.

Economics and evolutionary theory have a long history together, and one of its criticisms is that there has been too much analogizing about how the economy might be like an evolutionary system. For example, one might say that computer industry is like an ecological niche, with different species of players such as chip designer, hard-drive manufacturers, software providers, and so on, engaged in a 'survival of the fittest' struggle. Paul Krugman calls such metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating.

If the economy is truly an evolutionary system, and there are general laws of the latter, then it follows that there are general laws of economics – a controversial notion for many. Saying that there are laws of economics doesn't imply that we will ever be able to make perfect predictions about the economy, but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today. It also means that economics in the future may be able to make prescriptive recommendations about business and public policy.

**Q24.** All the following highlight the differences between the Yanomamo tribesmen and the New Yorkers as indicated in the passage EXCEPT:

- a) New Yorkers earn money whereas Yanomamo tribesmen do not.
- b) **Yanomamo tribesmen lack a writing system and a numbering system that is beyond primitive unlike the New Yorkers.**
- c) **The main occupation of the Yanomamo tribesmen is gathering food and gardening and they are not as wealthy as the New Yorkers.**
- d) **The New Yorkers have greater mental capacity than the Yanomamo tribesmen.**

You did not answer this question

Show Correct Answer

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	2
Avg. time spent on this question by all students	72
Difficulty Level	M
Avg. time spent on this question by students who got this question right	69
% of students who attempted this question	41.81
% of students who got the question right of those who attempted	81.22

[Video Solution](#)

## Text Solution

### Number of words and Explanatory notes for RC:

Number of words: 757

The differences between the two are highlighted as the following: '**Both tribes** share the same thirty thousand or so genes that all humans do and thus, in terms of **biology and innate intelligence** are **essentially identical**. **Yet**, the **lifestyle of the latter** (New Yorkers) **is vastly different from the former** (Yanomamo) who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond **one, two, and many**. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.'

Option A: From 'The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money', it is obvious that the tribesmen don't earn money directly and the \$90 is just an approximation in monetary value of what they gain (probably through gardening/hunting/gathering food). What they gather/produce has monetary value but they do not directly earn cash given their lifestyle. Hence, choice A is a difference, and is not the answer.

Option B: From 'have no writing, and have a numbering system that does not go beyond **one, two, and many**', it can be understood that the Yanomamo tribesmen didn't have a writing system and only used a number system that had just three indicators (one, two and many) – primitive. This, can be inferred as a difference because the line starts with '**Yet**, the **lifestyle of the latter** (New Yorkers) **is vastly different from the former** (Yanomamo)' suggesting New Yorkers have a mechanism for writing as well as numbering. Choice B is therefore, not the answer.

Option C: From 'The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening', it can be understood that the main avocation of the tribesmen was gathering food from the forest or gardening or hunting. Hence, C can be understood as a difference. Choice C is not the answer.

Option D: Both tribes, with the same set of genes were same, according to the passage, in terms of biology and innate intelligence (intellect). Hence, intellect didn't separate the Yanomamo from the New Yorkers. Choice D is therefore, the answer.

Choice (D)

undefined

**DIRECTIONS** for questions 20 to 25: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Consider two tribes: the Yanomamo, a stone-tool-making hunter-gatherer tribe living along the Orinoco River on the remote border of Brazil and Venezuela and second, the New Yorkers, a cell-phone-talking, café-latte-drinking tribe living along the Hudson River on the border of New York and New Jersey. Both tribes share the same thirty thousand or so genes that all humans do and thus, in terms of biology and innate intelligence are essentially identical. Yet, the lifestyle of the latter is vastly different from the former, who have yet to invent the wheel, have no writing, and have a numbering system that does not go beyond **one, two, and many**. The Yanomamo employment is focused on collecting food in the forest, hunting small game, gardening a limited number of fruits and vegetables, and maintaining shelters, whilst making baskets, hammocks, stone tools and weapons. The average income of a Yanomamo tribesman is \$90 per person per year, an estimate considering they do not use money, while the average income of a New Yorker in 2001 was around \$36000. It is not just the absolute level of income that makes New Yorkers so wealthy; it is also the incredible variety of things their wealth can buy.

To summarise 2.5 million years of economic history in brief: for a very, very long time not much happened; then all of a sudden, all hell broke loose. It took 99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750, and then just 0.01 percent for global wealth to leap to the levels of the modern world. Another way to think of it is that over 97 percent of humanity's wealth was created in just the last 0.01 percent of our history. As the economic historian David Landes describes it, 'The Englishman of 1750 was closer in material things to Caesar's legionnaires than to his own great-grandchildren.'

How can something as complex and highly structured as the economy be created and work in a self-organised and bottom-up way? And, why does there appear to be a correlation between the complexity of an economy and its wealth? Why has the growth in wealth and complexity been sudden and explosive rather than smooth?

Any theory that seeks to explain what wealth is and how it is created must answer these questions. While we know the historical narrative of what has happened for example, the advent of settled agriculture, the Industrial Revolution, and so on, we still need a theory of how and why it happened. Modern science provides just such a theory. Wealth creation is the product of a simple, but profoundly powerful, three-step formula – differentiate, select, and amplify – the formula for evolution. The same process that has driven the growing order and complexity of the biosphere has driven the growing order and complexity of the 'econosphere'.

We are accustomed to thinking of evolution in a biological context, but modern evolutionary theory views evolution as something much more general – evolution is an algorithm; it is an all-purpose formula for innovation, a formula that through its special brand of trial and error, creates new designs and solves difficult problems. Evolution can perform its tricks not just in the substrate of DNA but in any system that has the right information processing and information-storage characteristics. In short, evolution's simple recipe of 'differentiate, select, and amplify' is a type of computer program to create novelty, knowledge, and growth.

Economics and evolutionary theory have a long history together, and one of its criticisms is that there has been too much analogizing about how the economy might be like an evolutionary system. For example, one might say that computer industry is like an ecological niche, with

different species of players such as chip designer, hard-drive manufacturers, software providers, and so on, engaged in a 'survival of the fittest' struggle. Paul Krugman calls such metaphorical comparisons of economic and biological systems 'biobabble', which is neither good science nor very illuminating.

If the economy is truly an evolutionary system, and there are general laws of the latter, then it follows that there are general laws of economics – a controversial notion for many. Saying that there are laws of economics doesn't imply that we will ever be able to make perfect predictions about the economy, but it does imply that we might someday have a far deeper understanding of economic phenomena than we do today. It also means that economics in the future may be able to make prescriptive recommendations about business and public policy.

**Q25.** All the following can be inferred from the second para EXCEPT:

- a) The wealth level in 1750 constitutes about 3% of the wealth level of the modern world.
- b) The wealth levels of the Yanomamo tribesmen weren't the same as those of people in 1750.
- c) The wealth level in 1750 doubled to reach the modern-day wealth level in just 0.01 percent of economic history. Your answer is correct
- d) The wealth created in the first 99.4 percent of economic history was the same as the wealth created in the next 0.59 percent of economic history.

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	399
Avg. time spent on this question by all students	135
Difficulty Level	M
Avg. time spent on this question by students who got this question right	143
% of students who attempted this question	34.77
% of students who got the question right of those who attempted	36.73

[Video Solution](#)

[Text Solution](#)

#### Number of words and Explanatory notes for RC:

Number of words: 757

It took 99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750, and then just 0.01 percent for global wealth to leap to the levels of the modern world. Another way to think of it is that over 97 percent of humanity's wealth was created in just the last 0.01 percent of our history.

In terms of timeline we can understand that: Yanomamo tribesmen – 99.4 percent of economic history, 1750 represents 99.99 percent of economic history and 0.01 percent history is until the modern day

Option A: From '97 percent of humanity's wealth was created in just the last 0.01 percent of our history' we can understand that in 1750, just before the 0.01 percent of economic history started, we were at 3% of the present wealth level. Hence, choice A is true and not the answer.

Option B: The wealth levels doubled from that of the Yanomamo to that of 1750 in 0.59 percent of economic history (underlined above). In other words, the Yanomamo tribesmen were at a lesser level of wealth than the levels in 1750. So, it can be said that the wealth levels of the Yanomamo tribesmen weren't the same as those in 1750. Hence, choice B is not the answer.

Option C: From '97 percent of humanity's wealth was created in just the last 0.01 percent of our history' we can understand that the level in 1750 was just at 3%. Doubling that wouldn't give us the modern-day wealth level. This cannot be inferred. Hence, C is the answer.

Option D: From '99.4 percent of economic history to reach the wealth levels of the Yanomamo, 0.59 percent to double that level by 1750' as much wealth was created in the 0.59 percent of economic history (up until 1750) as was created in the first 99.4 percent, up to the wealth levels of Yanomamo. Basically, x became 2x from 99.4 to 99.99. So, the wealth created in 99.4 percent was same as that created in the next 0.59. Choice D can be inferred and hence, is not the answer.

Choice (C)

undefined

**DIRECTIONS** for questions 26 to 28: The passage given below is accompanied by a set of three questions. Choose the best answer to each question.

**SAMUEL JOHNSON**, the famous lexicographer, defined his profession as being that of "a harmless drudge". But Johnson's fame has never dispelled the idea that the lexicographer is a humdrum, bookish type who reads for precision and who dutifully approves the "right" meanings of "good" words while preventing "wrong" definitions and "bad" words from entering the dictionary. Lexicographers still struggle, in vain, to dispel this myth about their role. They put the words that people actually use into the dictionary, good ones and bad ones, new ones and old ones.

In a new book, "Word by Word", Kory Stamper, a lexicographer for Merriam-Webster, duly carries on the tradition, reminding readers that a lexicographer is a chronicler, not a guardian. She says that a chronicler need not be meek and dispassionate but must list out the rules, many of them hidden and not obvious, of the human language ability. The reader expecting august authority finds it difficult to pinpoint what part of speech a word belongs to. "But" is usually a conjunction, yet Ms Stamper is not fully sure that it is still one in the sentence "What can they do but try?" A colleague proclaims "but" to be a preposition here. Senior editors sigh, ruling that definitions are more important than grammar in a dictionary, and (rightly) noting that the eight parts of speech into which words are sorted in traditional grammars are not enough for English.

If lexicography were easy, no one would need a dictionary: meaning and use would be obvious to all. But even after years of reading and defining, the lexicographer finds out how slippery language can be when it comes to pronunciation, grammar and almost every level of language production. It constantly confounds prejudices and refuses to be pinned down. All dictionary-writers can do, in the end, is work hard to describe how a word is used out in the world. If they tried to let their own personal sense of right and wrong come into it, there would be no way of judging between two editors who disagree, or knowing what to do when an old belief runs against the evidence.

Yet judgment has its place. Ms Stamper frequently makes online videos for Merriam-Webster's "Ask the Editor" series. One of these is about the plural of "octopus". Many people will rush to show off their Latin: it must be "octopi". But "octopus" originally comes from Greek (*pous* is foot). If you really want to flaunt your classics training, you should call the eight-footed creatures "octopodes". But the best bet is to use English's own rules for creating plurals, and call them "octopuses", Ms Stamper rules, and don't let anyone call you "an ignorant slob" for doing so.

**Q26.** Which of the following is the myth about the role of lexicographers as can be inferred from the passage?

- a) People think that the grammatical rules prescribed by lexicographers is not associated with drudgery but with fascinating self-discovery.
- b) **People assume that a lexicographer is a humdrum, bookish chronicler and not a guardian of the English language.**
- c) **People believe that a lexicographer introduces all sorts of words into a dictionary – good ones and bad ones, new ones and old ones – but he does not adequately describe how a word is used out in the world.**
- d) **People think that a lexicographer's profession is one of drudgery; he has to separate the wheat from the chaff by approving only the correct meanings of "good" words and censoring the "wrong" definitions and "bad" words from the dictionary.** Your answer is correct

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	174
Avg. time spent on this question by all students	240
Difficulty Level	E
Avg. time spent on this question by students who got this question right	234
% of students who attempted this question	29.53
% of students who got the question right of those who attempted	74.57

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 452

Samuel Johnson, the famous lexicographer, defined his profession as being that of "a harmless drudge".

Option A: Choice A is incorrect. But Johnson's fame has never dispelled (banished) the idea that the lexicographer is a humdrum, bookish type who reads for precision... So to say that "the grammatical rules prescribed by lexicographers is not associated with drudgery" is not the myth that people have about the role of lexicographers.

Option B: But Johnson's fame has never dispelled (banished) the idea that the lexicographer is a humdrum, bookish type who reads for precision .... However the second part of choice B is not related to the question. It is not the people who think that a lexicographer is a chronicler and not a guardian of the language but Kory Stamper, a lexicographer for Merriam-Webster, who says so.

Option C: Lexicographers still struggle, largely in vain, to dispel this myth about their role. They put the words that people actually use into the dictionary, good ones and bad ones, new ones and old ones. So the first part of choice C is not the myth that people have. It is the corrected version or points to what the reality is. The second part of choice C is not specific to the question. In the fourth para we are told that "All dictionary-writers can do, in the end, is work hard to describe how a word is used out in the world." Choice C is not the answer.

Option D: But Johnson's fame has never dispelled the idea that the lexicographer is a humdrum, bookish type who reads for precision and who dutifully approves the "right" meanings of "good" words while preventing "wrong" definitions and "bad" words from entering the dictionary. Choice D refers to the myth that people have and what lexicographers try to dispel.

Choice (D)

undefined

**DIRECTIONS** for questions 26 to 28: The passage given below is accompanied by a set of three questions. Choose the best answer to each question.

**SAMUEL JOHNSON**, the famous lexicographer, defined his profession as being that of "a harmless drudge". But Johnson's fame has never dispelled the idea that the lexicographer is a humdrum, bookish type who reads for precision and who dutifully approves the "right" meanings of "good" words while preventing "wrong" definitions and "bad" words from entering the dictionary. Lexicographers still struggle, in vain, to dispel this myth about their role. They put the words that people actually use into the dictionary, good ones and bad ones, new ones and old ones.

In a new book, "Word by Word", Kory Stamper, a lexicographer for Merriam-Webster, duly carries on the tradition, reminding readers that a lexicographer is a chronicler, not a guardian. She says that a chronicler need not be meek and dispassionate but must list out the rules, many of them hidden and not obvious, of the human language ability. The reader expecting august authority finds it difficult to pinpoint what part of speech a word belongs to. "But" is usually a conjunction, yet Ms Stamper is not fully sure that it is still one in the sentence "What can they do but try?" A colleague proclaims "but" to be a preposition here. Senior editors sigh, ruling that definitions are more important than grammar in a dictionary, and (rightly) noting that the eight parts of speech into which words are sorted in traditional grammars are not enough for English.

If lexicography were easy, no one would need a dictionary: meaning and use would be obvious to all. But even after years of reading and defining, the lexicographer finds out how slippery language can be when it comes to pronunciation, grammar and almost every level of language production. It constantly confounds prejudices and refuses to be pinned down. All dictionary-writers can do, in the end, is work hard to describe how a word is used out in the world. If they tried to let their own personal sense of right and wrong come into it, there would be no way of judging between two editors who disagree, or knowing what to do when an old belief runs against the evidence.

Yet judgment has its place. Ms Stamper frequently makes online videos for Merriam-Webster's "Ask the Editor" series. One of these is about the plural of "octopus". Many people will rush to show off their Latin: it must be "octopi". But "octopus" originally comes from Greek (*pous* is foot). If you really want to flaunt your classics training, you should call the eight-footed creatures "octopodes". But the best bet is to use English's own rules for creating plurals, and call them "octopuses", Ms Stamper rules, and don't let anyone call you "an ignorant slob" for doing so.

**Q27.** Which of the following cannot be inferred about language from the passage?

- a) There are hidden rules not just in grammar but at every level of language production. Your answer is incorrect
- b) The discipline of language needs a marketing overhaul because linguistics involves describing the rules, many of them hidden and not obvious, of the human language ability.
- c) Lexicographers sometimes must make hard calls about unclear facts when people's mental grammar and English usage cannot deal with unusual cases of the language.
- d) Even a language-professional would take quite some time to be acquainted with all the nuances of the language, and these may not be covered by traditional rules.

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	212
Avg. time spent on this question by all students	134
Difficulty Level	D
Avg. time spent on this question by students who got this question right	134
% of students who attempted this question	17.06
% of students who got the question right of those who attempted	44.25

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 452

Option A: If lexicography were easy, no one would need a dictionary: meaning and use would be obvious to all. But even after years of reading and defining, the lexicographer finds out how slippery language can be when it comes to pronunciation, grammar and almost every level of language production. Choice A can be inferred and is not the answer.

Option B: Kory Stamper says that a lexicographer or chronicler need not be meek and dispassionate but must list out the rules, many of them hidden and not obvious, of the human language ability. While the second part of choice B is true, the first part is out of scope. Choice B cannot be inferred and is the answer.

Option C: Choice C can be inferred from a reading of the third para and the last para of the passage. Choice C is not the answer.

Option D: Senior editors sigh, ruling that definitions are more important than grammar in a dictionary, and (rightly) noting that the eight parts of speech into which words are sorted in traditional grammars are not enough for English. But even after years of reading and defining, the lexicographer finds out how slippery language can be when it comes to pronunciation, grammar and almost every level of language production. Choice D is true and is not the answer.

Choice (B)

undefined

**DIRECTIONS** for questions 26 to 28: The passage given below is accompanied by a set of three questions. Choose the best answer to each question.

SAMUEL JOHNSON, the famous lexicographer, defined his profession as being that of "a harmless drudge". But Johnson's fame has never dispelled the idea that the lexicographer is a humdrum, bookish type who reads for precision and who dutifully approves the "right" meanings of "good" words while preventing "wrong" definitions and "bad" words from entering the dictionary. Lexicographers still struggle, in vain, to dispel this myth about their role. They put the words that people actually use into the dictionary, good ones and bad ones, new ones and old ones.

In a new book, "Word by Word", Kory Stamper, a lexicographer for Merriam-Webster, duly carries on the tradition, reminding readers that a lexicographer is a chronicler, not a guardian. She says that a chronicler need not be meek and dispassionate but must list out the rules, many of them hidden and not obvious, of the human language ability. The reader expecting august authority finds it difficult to pinpoint what part of speech a word belongs to. "But" is usually a conjunction, yet Ms Stamper is not fully sure that it is still one in the sentence "What can

they do but try?" A colleague proclaims "but" to be a preposition here. Senior editors sigh, ruling that definitions are more important than grammar in a dictionary, and (rightly) noting that the eight parts of speech into which words are sorted in traditional grammars are not enough for English.

If lexicography were easy, no one would need a dictionary: meaning and use would be obvious to all. But even after years of reading and defining, the lexicographer finds out how slippery language can be when it comes to pronunciation, grammar and almost every level of language production. It constantly confounds prejudices and refuses to be pinned down. All dictionary-writers can do, in the end, is work hard to describe how a word is used out in the world. If they tried to let their own personal sense of right and wrong come into it, there would be no way of judging between two editors who disagree, or knowing what to do when an old belief runs against the evidence.

Yet judgment has its place. Ms Stamper frequently makes online videos for Merriam-Webster's "Ask the Editor" series. One of these is about the plural of "octopus". Many people will rush to show off their Latin: it must be "octopi". But "octopus" originally comes from Greek (*pous* is foot). If you really want to flaunt your classics training, you should call the eight-footed creatures "octopodes". But the best bet is to use English's own rules for creating plurals, and call them "octopuses", Ms Stamper rules, and don't let anyone call you "an ignorant slob" for doing so.

**Q28.** What does Ms Stamper, the lexicographer, advocate in the concluding part of the passage?

- a) One must judiciously apply the rules of the English language.
- b) When an old belief runs against the evidence presented in a text, one must rely on one's belief.
- c) Though one must always obey and follow the language pundits, one wouldn't be called an "ignorant slob" if one tried to stretch the rules based on one's personal sense of correct and incorrect.
- d) One must be wildly enthusiastic about language; jokey, friendly, but nobody's fool when it comes to twisting the language metaphorically.

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	92
Avg. time spent on this question by all students	106
Difficulty Level	D
Avg. time spent on this question by students who got this question right	111
% of students who attempted this question	25.78
% of students who got the question right of those who attempted	33.33

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 452

It can be inferred from the passage that Ms Stamper is against letting one's own personal sense of right and wrong coming in the way of a dictionary-writer's work.

Option A: All dictionary-writers can do, in the end, is work hard to describe how a word is used out in the world. If they tried to let their own personal sense of right and wrong come into it, there would be no way of judging between two editors who disagree. ... Yet judgement has its place. .... But the best bet is to use English's own rules for creating plurals, and call them "octopuses", Ms Stamper rules, and don't let anyone call you "an ignorant slob" for doing so. Choice A is correct.

Option B: If they tried to let their own personal sense of right and wrong come into it, there would be no way of judging between two editors who disagree, or knowing what to do when an old belief runs against the evidence. Choice B runs contrary to what the lexicographer, Ms Stamper, advocates in the latter half of the passage.

Option C: The first part of choice C is correct but the second part is distorted. The last sentence of the last para is: "don't let anyone call you "an ignorant slob" for creating plurals, and calling them "octopuses"". The second part of choice C incorrectly states: one wouldn't be called an "ignorant slob" if one tried to stretch the rules based on one's personal sense of correct and incorrect. Ms. Stamper does not advocate using rules based on one's "personal" sense of correct and incorrect.

Option D: Choice D (wildly enthusiastic about language and twisting the language metaphorically) is out of scope.

Choice (A)

undefined

**DIRECTIONS** for questions 29 to 34: The passage given below is accompanied by a set of six questions. Choose the best answer to each

question.

Although he lived long ago, the ethical writings of the Greek philosopher Aristotle (384-322 BCE) still have relevance to the present day, particularly when we want to understand the meaning of friendship. In Books VIII and IX of his work the Nicomachean Ethics, Aristotle categorizes three different types of friendship: friendships of utility, friendships of pleasure, and friendships of the good (also known as virtuous friendships). Briefly, friendships of utility are where people are on cordial terms primarily because each person benefits from the other in some way. Friendships of pleasure are those where individuals seek out each other's company because of the joy it brings them. Passionate love affairs and people belonging to the same cultural or social organization fall into this category. Most important of all are friendships of the good. These are friendships based upon mutual respect, admiration for each other's virtues, and a strong desire to aid and assist the other person because one recognizes an essential goodness in them. But, the questions remain – just why do we need friends? And if we do need them, how do such relationships arise?

Aristotle writes, "For without friends no one would choose to live, though he had all other goods". But just why is this so? Because friends are central to Aristotle's overall conception of what constitutes a good life. In the larger context of the Nicomachean Ethics, Aristotle addresses what makes us human. In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best? In this context, Books VIII and IX of the ten-book Nicomachean Ethics are part of his discussion of the nature of eudaimonia, a term often translated as 'happiness' but which literally means [having a] 'good soul'. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human.

We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls philia, which is the 'friendship of the good'. For Aristotle, the best way of defining philia (what we might these days call 'close friends') is 'those who hold what they have in common'. Essentially, philia is a personal bond you have with another being which is freely chosen because of the virtues you see in your friend. Polis is the ancient Greek term for city, but it literally means 'a body of citizens', and it relates to the fact that most of us live not just within a family structure but rather within a larger political system. Yet most of the people in such a system are strangers to each other. If they were all related, it would be clearer what roles each person is to play (for instance, when a monarch has children, usually the firstborn is deemed to be the next in line to rule); but in most political systems there is more flexibility, and more opportunity for people to develop their talents in different ways. Good friends become useful in this sort of political situation.

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible, for the basic reason that friendship requires commitment of time and a trusting relationship, and there are natural limits to how many such connections we can make.

**Q29.** All the following satisfy at least one of Aristotle's criteria for friendships EXCEPT:

- a) The relationship one shares with mentors, mentees, official superiors, principals, classmates who are just acquaintances, and family doctors.
- b) The relationship one shares with one's father-in-law and mother-in-law.
- c) The close bond one feels with movie-stars and corporate barons one relates to and idolizes. Your answer is correct
- d) The relationship one shares with drinking, fishing, riding and bowling buddies.

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>235</b>
Avg. time spent on this question by all students	<b>308</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>303</b>
% of students who attempted this question	<b>42.76</b>
% of students who got the question right of those who attempted	<b>71.13</b>

[Video Solution](#)

[Text Solution](#)

#### Number of words and Explanatory notes for RC:

Number of words: 659

Aristotle categorizes three different types of friendship: friendships of utility, friendships of pleasure, and friendships of the good. Briefly, friendships of utility are where people are on cordial terms primarily because each person benefits from the other in some way. Friendships of pleasure are those where individuals seek out each other's company because of the joy it brings them. Passionate love affairs and people belonging to the same cultural or social organization fall into this category. Most important of all are friendships of the good. These are friendships based upon mutual respect, admiration for each other's virtues, and a strong desire to aid and assist the other person because one recognizes an essential goodness in them.

Aristotle writes about three types of friendships: those which are cordial and involve a mutual benefit, those which involve passion/love/social structure and those which are based on innate goodness of the two people involved. The underscored portions show how to identify each of these friendships.

Option A: When mentors and mentees, superiors, principals, classmates who are just acquaintances and family doctors are involved – there is either mutual benefit or at least, cordial terms unless stated otherwise. Therefore, A satisfies the first of the three alternative criteria explained by Aristotle. Hence, choice A is not the answer.

Option B: This relationship can be justified under the second category where two individuals belong to the same cultural or social organisation. Hence, choice B is not the answer.

Option C: This is an indirect relationship where there is neither a mutual benefit (probably the idols don't even know about the existence of the individuals who idolize them) nor a shared cultural/social organisation necessarily. There isn't company or mutual admiration. Choice C doesn't fit into any of the three criteria. Hence, choice C is the answer.

Option D: Drinking, fishing, riding and bowling buddies satisfy the second and third criteria – seeking company for the joy it brings, and also because of the mutual admiration and a need to aid and assist. Hence, choice D is not the answer.

Choice (C)

undefined

**DIRECTIONS** for questions 29 to 34: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

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Aristotle writes, "For without friends no one would choose to live, though he had all other goods". But just why is this so? Because friends are central to Aristotle's overall conception of what constitutes a good life. In the larger context of the Nicomachean Ethics, Aristotle addresses what makes us human. In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best? In this context, Books VIII and IX of the ten-book Nicomachean Ethics are part of his discussion of the nature of eudaimonia, a term often translated as 'happiness' but which literally means [having a] 'good soul'. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human.

We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls philia, which is the 'friendship of the good'. For Aristotle, the best way of defining philia (what we might these days call 'close friends') is 'those who hold what they have in common'. Essentially, philia is a personal bond you have with another being which is freely chosen because of the virtues you see in your friend. Polis is the ancient Greek term for city, but it literally means 'a body of citizens', and it relates to the fact that most of us live not just within a family structure but rather within a larger political system. Yet most of the people in such a system are strangers to each other. If they were all related, it would be clearer what roles each person is to play (for instance, when a monarch has children, usually the firstborn is deemed to be the next in line to rule); but in most political systems there is more flexibility, and more opportunity for people to develop their talents in different ways. Good friends become useful in this sort of political situation.

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible, for the basic reason that friendship requires commitment of time

and a trusting relationship, and there are natural limits to how many such connections we can make.

**Q30.** Which of the following best elucidates the fallacy in the way Epicurus' followers understood Aristotle's exhortation?

- a) While Aristotle depicted a highly specific set of situations, they extended it as a generalization.
- b) While Aristotle was speaking of a utopian situation, they misunderstood it as practically feasible.
- c) While Aristotle was suggesting how an individual could lead a life, they misunderstood it as a way of building society.
- d) While Aristotle was speaking of how to avoid creating needless laws, they misunderstood it as a paragon of the justice-system. □ Your answer is incorrect

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>241</b>
Avg. time spent on this question by all students	<b>135</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>130</b>
% of students who attempted this question	<b>32.79</b>
% of students who got the question right of those who attempted	<b>27.96</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 659

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible. The fallacy pointed out in the passage is – Aristotle gave a proposition that IF we are all friends, we wouldn't need justice. However, according to Aristotle this was clearly impossible to achieve. On the other hand, followers of Epicurus assumed that this is how we should try to live.

Option A: Aristotle's proposition carries an 'IF' which Aristotle himself calls impossible. So, Aristotle's depiction doesn't apply even for a specific set of situations. It isn't feasible according to Aristotle. Hence, choice A doesn't point to the fallacy. Choice A is not the answer.

Option B: Aristotle says that in a world where we are all friends, we wouldn't need justice, but such a world isn't possible because there is a limit to how many connections we can make. In other words, Aristotle was talking about an ideal (utopian) situation. On the other hand, the followers of Epicurus believed that this utopian society can be a way of life, presuming that it is indeed possible to achieve it practically. Hence, choice B explains their misunderstanding. Choice B is the answer.

Option C: Aristotle's suggestion wasn't limited to one individual from 'Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences.' Hence, choice C misreports the data. Choice C is not the answer.

Option D: This is one of the easier options to eliminate. Aristotle's primary aim was to talk about the effect of friendships and human connection. Aristotle's aim was not to discourage laws from being made. Similarly, followers of Epicurus were concerned about creating a utopian society but not necessarily a justice system. Hence, choice D is not the answer.

Choice (B)

undefined

**DIRECTIONS for questions 29 to 34:** The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Although he lived long ago, the ethical writings of the Greek philosopher Aristotle (384-322 BCE) still have relevance to the present day, particularly when we want to understand the meaning of friendship. In Books VIII and IX of his work the Nichomachean Ethics, Aristotle categorizes three different types of friendship: friendships of utility, friendships of pleasure, and friendships of the good (also known as virtuous friendships). Briefly, friendships of utility are where people are on cordial terms primarily because each person benefits from the other in some way. Friendships of pleasure are those where individuals seek out each other's company because of the joy it brings them. Passionate love affairs and people belonging to the same cultural or social organization fall into this category. Most important of all are friendships of the good. These are friendships based upon mutual respect, admiration for each other's virtues, and a strong desire to aid and assist the other person because one recognizes an essential goodness in them. But, the questions remain – just why do we need

friends? And if we do need them, how do such relationships arise?

Aristotle writes, "For without friends no one would choose to live, though he had all other goods". But just why is this so? Because friends are central to Aristotle's overall conception of what constitutes a good life. In the larger context of the Nichomachean Ethics, Aristotle addresses what makes us human. In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best? In this context, Books VIII and IX of the ten-book Nichomachean Ethics are part of his discussion of the nature of eudaimonia, a term often translated as 'happiness' but which literally means [having a] 'good soul'. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human.

We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls philia, which is the 'friendship of the good'. For Aristotle, the best way of defining philia (what we might these days call 'close friends') is 'those who hold what they have in common'. Essentially, philia is a personal bond you have with another being which is freely chosen because of the virtues you see in your friend. Polis is the ancient Greek term for city, but it literally means 'a body of citizens', and it relates to the fact that most of us live not just within a family structure but rather within a larger political system. Yet most of the people in such a system are strangers to each other. If they were all related, it would be clearer what roles each person is to play (for instance, when a monarch has children, usually the firstborn is deemed to be the next in line to rule); but in most political systems there is more flexibility, and more opportunity for people to develop their talents in different ways. Good friends become useful in this sort of political situation.

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible, for the basic reason that friendship requires commitment of time and a trusting relationship, and there are natural limits to how many such connections we can make.

**Q31.** Which of the following inferences can be drawn about 'Eudaimonia' based on the evidence given in the passage?

- a) Eudaimonia cannot be achieved without 'philia' in one's life.
- b) Eudaimonia can be achieved if one invests in friendships that translate to a good life. Your answer is correct
- c) Eudaimonia can be achieved only if one invests in friendships that translate to a good life.
- d) Eudaimonia cannot be achieved unless one makes virtuous friendships.

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>349</b>
Avg. time spent on this question by all students	<b>140</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>139</b>
% of students who attempted this question	<b>36.7</b>
% of students who got the question right of those who attempted	<b>62.13</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 659

'the nature of eudaimonia, a term often translated as 'happiness' but which literally means [having a] 'good soul'. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human. (Meaning friendship connects to the nature of what it means to be human – suggested by the 'comma' before 'and') One has to differentiate between 'friendship as an idea' and the various types of possible friendships according to Aristotle.

Option A: Friendship is a part of what makes for eudaimonia. Without friendship, eudaimonia is not possible to achieve. Philia (friendship of the good) is one of the three types of friendship as elucidated in the passage. So, it cannot be inferred that philia is a requisite criterion since Aristotle doesn't clearly say this is the only friendship that matters for eudaimonia. This is similar to Cherry-picking fallacy. Hence, choice A is not the answer.

Option B: Friendship, as explained above, leads us to eudaimonia. So, investing in friendship helps us reach eudaimonia, the happiness. This is also confirmed from the line – 'Because friends are central to Aristotle's overall conception of what constitutes a good life'. Hence, choice B is the answer.

Option C: Aristotle clearly suggests that friends are central to a good life. The usage of the word 'that' however suggests that not all friendships lead us to a good life. In other words, the option grammatically means one must invest only in one type of friendships – the ones that lead to a good life. (the 'only' is a massive clue to pick the fault). As per the passage though, there is no such distinction and friends are always central to a good life. There is no distinction made between good and bad friendships. Hence, choice C is not the answer.

Option D: This is very similar to selective attention fallacy when the argument is based on only part of the information that suits the requirement. Aristotle connects eudaimonia and friendships to a good life. One of the types of friendship is virtuous friendships or friendships of the good. Eudaimonia means 'a good soul'. However, one cannot connect these separate bits to proclaim that Eudaimonia can only be achieved if one has friendships of the 'good' (arguing that eudaimonia means a good soul and friendships are essential for a good life). By making virtuous friendships one can go closer to eudaimonia. However, the reverse is not necessarily true. Choice D is not the answer.

Choice (B)

undefined

**DIRECTIONS** for questions 29 to 34: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

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Aristotle writes, "For without friends no one would choose to live, though he had all other goods". But just why is this so? Because friends are central to Aristotle's overall conception of what constitutes a good life. In the larger context of the Nicomachean Ethics, Aristotle addresses what makes us human. In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best? In this context, Books VIII and IX of the ten-book Nicomachean Ethics are part of his discussion of the nature of eudaimonia, a term often translated as 'happiness' but which literally means [having a] 'good soul'. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human.

We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls philia, which is the 'friendship of the good'. For Aristotle, the best way of defining philia (what we might these days call 'close friends') is 'those who hold what they have in common'. Essentially, philia is a personal bond you have with another being which is freely chosen because of the virtues you see in your friend. Polis is the ancient Greek term for city, but it literally means 'a body of citizens', and it relates to the fact that most of us live not just within a family structure but rather within a larger political system. Yet most of the people in such a system are strangers to each other. If they were all related, it would be clearer what roles each person is to play (for instance, when

a monarch has children, usually the firstborn is deemed to be the next in line to rule); but in most political systems there is more flexibility, and more opportunity for people to develop their talents in different ways. Good friends become useful in this sort of political situation.

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible, for the basic reason that friendship requires commitment of time and a trusting relationship, and there are natural limits to how many such connections we can make.

**Q32.** Which of the following is not a reason behind human friendships?

- a) Because eudaimonia is an integral part of what makes us human. Your answer is incorrect
- b) Because we are essentially social and political beings whose existence is interdependent.
- c) Because with friends, there are amicable settlements and no need for justice.
- d) Because we stand to benefit from the cordial relationships we share with each other.

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>164</b>
Avg. time spent on this question by all students	<b>82</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>75</b>
% of students who attempted this question	<b>37.65</b>
% of students who got the question right of those who attempted	<b>49.58</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 659

From 'But, the questions remain – just why do we need friends? And if we do need them, how do such relationships arise?' we understand that the author is asking a similar question and the following paragraph explains the reasons. Aristotle writes, "For without friends no one would choose to live, though he had all other goods". But just why is this so? Because friends are central to Aristotle's overall conception of what constitutes a good life. The passage then moves on to – 'Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human. We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else.' This information can be used to answer the above question.

Option A: In the larger context of the Nichomachean Ethics, Aristotle addresses what makes us human. In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best? In this context, Books VIII and IX of the ten-book Nichomachean Ethics are part of his discussion of the nature of eudaimonia. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human.

Eudaimonia was discussed in the 'context' of Aristotle's 'fundamental questions' suggesting the link between 'a good life/happiness' and 'meaning of human life – the fundamental question'. Friendships take us closer to 'eudaimonia' which in turn takes us closer to understanding what makes us human. So, one of the reasons behind seeking friendships is that it is part of something (eudaimonia) that leads us to happiness and connects to the nature of what it means to be human. Hence, choice A is not the answer.

Option B: 'We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls philia, which is the 'friendship of the good'. From these lines, we can understand that we are social and political beings interdependent and rely on others for natural support and our own development – leading us to 'friendship of the good'. B explains one of the reasons behind our friendships. Hence, choice B is not the answer.

Option C: This is 'cum hoc ergo propter hoc' fallacy (Correlation doesn't imply causation) From 'Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws' we can understand that A (all people being friends in society) would (help in doing away with the laws). This doesn't necessarily mean A happens because of B. We cannot assume that people make friendships to get rid of the justice system or the need for laws. Hence, choice C is the answer.

Option D: From 'friendships of utility are where people are on cordial terms primarily because each person benefits from the other in some way', we can understand that one of the three types of friendships is because of our cordial relationships when there is mutual benefit. Choice D explains one of the fundamental types of friendships. Hence, choice D is not the answer.

Choice (C)

question.

Although he lived long ago, the ethical writings of the Greek philosopher Aristotle (384-322 BCE) still have relevance to the present day, particularly when we want to understand the meaning of friendship. In Books VIII and IX of his work the Nicomachean Ethics, Aristotle categorizes three different types of friendship: friendships of utility, friendships of pleasure, and friendships of the good (also known as virtuous friendships). Briefly, friendships of utility are where people are on cordial terms primarily because each person benefits from the other in some way. Friendships of pleasure are those where individuals seek out each other's company because of the joy it brings them. Passionate love affairs and people belonging to the same cultural or social organization fall into this category. Most important of all are friendships of the good. These are friendships based upon mutual respect, admiration for each other's virtues, and a strong desire to aid and assist the other person because one recognizes an essential goodness in them. But, the questions remain – just why do we need friends? And if we do need them, how do such relationships arise?

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We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls philia, which is the 'friendship of the good'. For Aristotle, the best way of defining philia (what we might these days call 'close friends') is 'those who hold what they have in common'. Essentially, philia is a personal bond you have with another being which is freely chosen because of the virtues you see in your friend. Polis is the ancient Greek term for city, but it literally means 'a body of citizens', and it relates to the fact that most of us live not just within a family structure but rather within a larger political system. Yet most of the people in such a system are strangers to each other. If they were all related, it would be clearer what roles each person is to play (for instance, when a monarch has children, usually the firstborn is deemed to be the next in line to rule); but in most political systems there is more flexibility, and more opportunity for people to develop their talents in different ways. Good friends become useful in this sort of political situation.

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible, for the basic reason that friendship requires commitment of time and a trusting relationship, and there are natural limits to how many such connections we can make.

**Q33.** Which of the following, if possible, can help one achieve eudaimonia in one's life?

- a) Pursuing liberal arts with all the passion one can muster. Your answer is incorrect
- b) Indulging in an environment which debilitates the human connection.
- c) Restricting our socializing to friends and family members.
- d) Developing friendship with every single person we encounter in our lives.

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>41</b>
Avg. time spent on this question by all students	<b>72</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>71</b>
% of students who attempted this question	<b>34.44</b>
% of students who got the question right of those who attempted	<b>44.69</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 659

It can be understood from the passage that a good life, human connection, friendships and eudaimonia are all connected. It must be noted here that the question offers a caveat – ‘If possible’. So, the question doesn’t necessarily ask if the options are possible. It asks whether the option, if it were possible, can take us closer to eudaimonia.

Option A: Pursuing liberal arts with passion cannot be inferred to have a human connection as per the data in the passage. ‘Passion’ has been spoken about in the passage but in terms of friendships, which are pursued for passion. Hence, choice A is not the answer.

Option B: An environment which debilitates (weaken) the human connection takes us away from a good life and from eudaimonia, as according to Aristotle ‘Our very development as humans is contingent on the proper, or natural, support given to us by other people.’ Indulging in such an environment takes us farther away from eudaimonia. Hence, choice B is not the answer.

Option C: While friends and family members offer a certain type of ‘friendship’ according to the passage, restricting ourselves to just these and not pursuing the third type of friendship (virtuous friendships) is not necessarily a positive action. While friendship is essential for eudaimonia and the author doesn’t exactly specify ‘what type of friendship’ this option particularly seems to focus on certain types of friendships rather than doing the right actions. We can eliminate the option based on tone. Hence, choice C is not the answer.

Option D: Developing friendships definitely takes us close to a good life. The only contention in this line is – do we need to develop friendships with everyone? The question asks ‘what would help’ not ‘what would ensure’ and this option doesn’t say only when we develop friendships with everyone do we find eudaimonia. On the contrary, one simply needs to interpret this as whether developing friendships with everyone helps in reaching eudaimonia. The answer would be, yes. Hence, choice D is the answer.

Choice (D)

undefined

**DIRECTIONS** for questions 29 to 34: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Although he lived long ago, the ethical writings of the Greek philosopher Aristotle (384-322 BCE) still have relevance to the present day, particularly when we want to understand the meaning of friendship. In Books VIII and IX of his work the Nicomachean Ethics, Aristotle categorizes three different types of friendship: friendships of utility, friendships of pleasure, and friendships of the good (also known as virtuous friendships). Briefly, friendships of utility are where people are on cordial terms primarily because each person benefits from the other in some way. Friendships of pleasure are those where individuals seek out each other’s company because of the joy it brings them. Passionate love affairs and people belonging to the same cultural or social organization fall into this category. Most important of all are friendships of the good. These are friendships based upon mutual respect, admiration for each other’s virtues, and a strong desire to aid and assist the other person because one recognizes an essential goodness in them. But, the questions remain – just why do we need friends? And if we do need them, how do such relationships arise?

Aristotle writes, “For without friends no one would choose to live, though he had all other goods”. But just why is this so? Because friends are central to Aristotle’s overall conception of what constitutes a good life. In the larger context of the Nicomachean Ethics, Aristotle addresses what makes us human. In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best? In this context, Books VIII and IX of the ten-book Nicomachean Ethics are part of his discussion of the nature of eudaimonia, a term often translated as ‘happiness’ but which literally means [having a] ‘good soul’. Friendship is part of what makes for eudaimonia, and connects to the nature of what it means to be human.

We are, as Aristotle points out, social and political beings. We cannot exist independently from everyone else. Our very development as humans is contingent on the proper, or natural, support given to us by other people. This leads us directly to the category of social relations Aristotle calls *philia*, which is the ‘friendship of the good’. For Aristotle, the best way of defining *philia* (what we might these days call ‘close friends’) is ‘those who hold what they have in common’. Essentially, *philia* is a personal bond you have with another being which is freely chosen because of the virtues you see in your friend. *Polis* is the ancient Greek term for city, but it literally means ‘a body of citizens’, and it relates to the fact that most of us live not just within a family structure but rather within a larger political system. Yet most of the people in such a system are strangers to each other. If they were all related, it would be clearer what roles each person is to play (for instance, when a monarch has children, usually the firstborn is deemed to be the next in line to rule); but in most political systems there is more flexibility, and more opportunity for people to develop their talents in different ways. Good friends become useful in this sort of political situation.

Aristotle points out that if in fact all people in a given society were friends, there would be no need for laws, since we would naturally work out our differences: "When people are friends," he writes, "they have no need of justice, but when they are just, they need friendship in addition". Some utopian thinkers, such as the followers of the later Greek philosopher Epicurus, took this to mean that we should attempt to live only among friends. But Aristotle is quite clear that this is not possible, for the basic reason that friendship requires commitment of time and a trusting relationship, and there are natural limits to how many such connections we can make.

**Q34.** Which of the following is not an assumption made by the author in 'In this book, Aristotle asks the fundamental questions - What does it mean to be a human being and what goals will bring out our best?'

- a) Seeking the true essence of being human is essential.
- b) One of the rudimentary ideals of life is to find goals that bring out our best. Your answer is incorrect
- c) Understanding the ethos of human life is a quintessential question worth being curious about.
- d) One cannot be truly human without eudaimonia.

**Show Correct Answer**

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>139</b>
Avg. time spent on this question by all students	<b>148</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>133</b>
% of students who attempted this question	<b>23.17</b>
% of students who got the question right of those who attempted	<b>40.77</b>

[Video Solution](#)

[Text Solution](#)

**Number of words and Explanatory notes for RC:**

Number of words: 659

The author assumes that 'fundamental' is equal to 'meaning of humanness' and 'bringing out our best'.

Option A: This option translates to searching for the meaning of being human and that is essential (fundamental) according to the author's assumption. Hence, choice A is an assumption and hence, not the answer.

Option B: Goals to bring our best (mentioned in the line above) is rudimentary (fundamental) according to the questions asked by the author. Hence, choice B is also an assumption and not the answer.

Option C: One of the fundamental questions (quintessential questions) worth asking according to the author is what it means to be a human being (ethos of human life). Hence, choice C is an assumption and not the answer.

Option D: This option suggests that an unhappy person is no real human. It would be a slippery slope fallacy if we arrive from 'we should seek eudaimonia' to 'if we don't seek eudaimonia we are not even humans.' Such an assumption has not been made by the author. Hence, choice D is the answer.

Choice (D)

undefined

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

Six friends, Amar, Amit, Ankit, Anuj, Abhinav, and Abhijeet, went shopping and each of them purchased a different item among a pair of Shoes, a Bag, a Shirt, a Mobile Phone, a Pen, and a Watch. Further it is also known that

- i. Ankit did not purchase either a pair of Shoes or a Bag, while Amar purchased a Mobile Phone.
- ii. Abhinav did not purchase either a pair of Shoes or a Pen, while Anuj purchased a Watch.
- iii. neither Amit nor Abhijeet purchased either a Pen or a Bag.

**Q1. DIRECTIONS** for question 1: Type in your answer in the input box provided below the question.

If Amit and Abhinav between themselves purchased a pair of Shoes and a Bag, how many of the remaining four items could Abhijeet have purchased?

**Your Answer:1 Your answer is correct**

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>344</b>
Avg. time spent on this question by all students	<b>319</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>309</b>
% of students who attempted this question	<b>66.65</b>
% of students who got the question right of those who attempted	<b>78.87</b>

[Video Solution](#)

#### Text Solution

Given Amar purchased a Mobile Phone and Anuj purchased a Watch. From (iii), Amit and Abhijeet must have purchased a pair of Shoes and a Shirt in any order. Hence, Abhinav must have purchased a Bag and Ankit must have purchased a Pen.  
Tabulating the above information,

Person	Amar	Amit	Ankit	Anuj	Abhinav	Abhijeet
Item	Mobile Phone	pair of Shoes / Shirt	Pen	Watch	Bag	Shirt / pair of Shoes

If Amit and Abhinav purchased pair of Shoes and Bag, Abhijeet could have purchased only one item, the Shirt.  
Ans: (1)

undefined

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

Six friends, Amar, Amit, Ankit, Anuj, Abhinav, and Abhijeet, went shopping and each of them purchased a different item among a pair of Shoes, a Bag, a Shirt, a Mobile Phone, a Pen, and a Watch. Further it is also known that

- i. Ankit did not purchase either a pair of Shoes or a Bag, while Amar purchased a Mobile Phone.
- ii. Abhinav did not purchase either a pair of Shoes or a Pen, while Anuj purchased a Watch.
- iii. neither Amit nor Abhijeet purchased either a Pen or a Bag.

**Q1. DIRECTIONS for question 1:** Type in your answer in the input box provided below the question.

If Amit and Abhinav between themselves purchased a pair of Shoes and a Bag, how many of the remaining four items could Abhijeet have purchased?

**Your Answer:1 Your answer is correct**

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>344</b>
Avg. time spent on this question by all students	<b>319</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>309</b>
% of students who attempted this question	<b>66.65</b>
% of students who got the question right of those who attempted	<b>78.87</b>

[Video Solution](#)

#### Text Solution

Given Amar purchased a Mobile Phone and Anuj purchased a Watch. From (iii), Amit and Abhijeet must have purchased a pair of Shoes and a Shirt in any order. Hence, Abhinav must have purchased a Bag and Ankit must have purchased a Pen.  
Tabulating the above information,

Person	Amar	Amit	Ankit	Anuj	Abhinav	Abhijeet
Item	Mobile Phone	pair of Shoes / Shirt	Pen	Watch	Bag	Shirt / pair of Shoes

If Amit and Abhinav purchased pair of Shoes and Bag, Abhijeet could have purchased only one item, the Shirt.

Ans: (1)

undefined

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

Six friends, Amar, Amit, Ankit, Anuj, Abhinav, and Abhijeet, went shopping and each of them purchased a different item among a pair of Shoes, a Bag, a Shirt, a Mobile Phone, a Pen, and a Watch. Further it is also known that

- i. Ankit did not purchase either a pair of Shoes or a Bag, while Amar purchased a Mobile Phone.
- ii. Abhinav did not purchase either a pair of Shoes or a Pen, while Anuj purchased a Watch.
- iii. neither Amit nor Abhijeet purchased either a Pen or a Bag.

**Q2. DIRECTIONS** for question 2: Select the correct alternative from the given choices.

What did Ankit purchase?

a)

Pen

Your answer is correct

b)

Shirt

c)

Shoes

d)

Cannot be determined

#### Time spent / Accuracy Analysis

Time taken by you to answer this question **11**

Avg. time spent on this question by all students **46**

Difficulty Level **E**

Avg. time spent on this question by students who got this question right **40**

% of students who attempted this question **67.37**

**Time spent / Accuracy Analysis**% of students who got the question right of those who attempted **74.02**[Video Solution](#)[Text Solution](#)

Given Amar purchased a Mobile Phone and Anuj purchased a Watch. From (iii), Amit and Abhijeet must have purchased a pair of Shoes and a Shirt in any order. Hence, Abhinav must have purchased a Bag and Ankit must have purchased a Pen.  
Tabulating the above information,

Person	Amar	Amit	Ankit	Anuj	Abhinav	Abhijeet
Item	Mobile Phone	pair of Shoes / Shirt	Pen	Watch	Bag	Shirt / pair of Shoes

Ankit purchased a Pen.

Choice (A)

undefined

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

Six friends, Amar, Amit, Ankit, Anuj, Abhinav, and Abhijeet, went shopping and each of them purchased a different item among a pair of Shoes, a Bag, a Shirt, a Mobile Phone, a Pen, and a Watch. Further it is also known that

- Ankit did not purchase either a pair of Shoes or a Bag, while Amar purchased a Mobile Phone.
- Abhinav did not purchase either a pair of Shoes or a Pen, while Anuj purchased a Watch.
- neither Amit nor Abhijeet purchased either a Pen or a Bag.

**Q3. DIRECTIONS for questions 3 and 4:** Type in your answer in the input box provided below the question.

How many of the following statements, each when taken independently, would be sufficient to determine the item purchased by each person?

- Abhinav purchased a Bag.
- Abhijeet purchased a pair of Shoes.
- Ankit purchased a Pen.
- Amit purchased a Shirt.

Shirt

Shoes

Cannot be determined

**Your Answer:2 Your answer is correct****Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>68</b>
Avg. time spent on this question by all students	<b>105</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>92</b>
% of students who attempted this question	<b>64.45</b>
% of students who got the question right of those who attempted	<b>68.43</b>

[Video Solution](#)[Text Solution](#)

Given Amar purchased a Mobile Phone and Anuj purchased a Watch. From (iii), Amit and Abhijeet must have purchased a pair of Shoes and a Shirt in any order. Hence, Abhinav must have purchased a Bag and Ankit must have purchased a Pen.  
Tabulating the above information,

Person	Amar	Amit	Ankit	Anuj	Abhinav	Abhijeet
Item	Mobile Phone	pair of Shoes / Shirt	Pen	Watch	Bag	Shirt / pair of Shoes

Either ii or iv would be sufficient to determine the exact combination.      Ans: (2)

undefined

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

Six friends, Amar, Amit, Ankit, Anuj, Abhinav, and Abhijeet, went shopping and each of them purchased a different item among a pair of Shoes, a Bag, a Shirt, a Mobile Phone, a Pen, and a Watch. Further it is also known that

- i. Ankit did not purchase either a pair of Shoes or a Bag, while Amar purchased a Mobile Phone.
- ii. Abhinav did not purchase either a pair of Shoes or a Pen, while Anuj purchased a Watch.
- iii. neither Amit nor Abhijeet purchased either a Pen or a Bag.

**Q4. DIRECTIONS** for questions 3 and 4: Type in your answer in the input box provided below the question.

How many combinations of persons and the items that they purchased are possible?

Shirt

Shoes

Cannot be determined

**Your Answer:2 Your answer is correct**

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>36</b>
Avg. time spent on this question by all students	<b>57</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>43</b>
% of students who attempted this question	<b>58.85</b>
% of students who got the question right of those who attempted	<b>62.78</b>

[Video Solution](#)

[Text Solution](#)

Given Amar purchased a Mobile Phone and Anuj purchased a Watch. From (iii), Amit and Abhijeet must have purchased a pair of Shoes and a Shirt in any order. Hence, Abhinav must have purchased a Bag and Ankit must have purchased a Pen.  
Tabulating the above information,

Person	Amar	Amit	Ankit	Anuj	Abhinav	Abhijeet
Item	Mobile Phone	pair of Shoes / Shirt	Pen	Watch	Bag	Shirt / pair of Shoes

2 combinations are possible.

Ans: (2)

undefined

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

Today morning, four persons – Prakash, Sangeeta, Piyush and Rakesh – arrived at the gym at the same time to exercise. Each of them exercised for the same amount of time on each of four machines, the Treadmill, the Elliptical, the Exercise Bike and the Stairmaster, exactly once. There is only one machine of each type present in the gym and only one person can use one machine at a time. No other members of the gym (other than these four persons) used any of the four machines today and none of the four persons waited for any machine. Also, none of the four machines was idle for any time until all the four persons had finished exercising on all the four machines. Further, it is known that

- i. Sangeeta could not use the Treadmill first because Prakash used it.
- ii. Rakesh used each of the Treadmill and the Stairmaster after Sangeeta finished using them.
- iii. Piyush used the Elliptical first, followed immediately by the Stairmaster.
- iv. Prakash used the Elliptical immediately after Sangeeta finished using the Treadmill

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

Who was the first person to use the Stairmaster?

a)

Sangeeta

Your answer is correct

b)

Piyush

c)

Rakesh

d)

Cannot be determined

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>251</b>
Avg. time spent on this question by all students	<b>473</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>477</b>
% of students who attempted this question	<b>58.64</b>
% of students who got the question right of those who attempted	<b>83.17</b>

[Video Solution](#)

[Text Solution](#)

From ii, Prakash was using the Treadmill first. From iv, Piyush used Elliptical first. From iii, Rakesh could not have used the Treadmill or Stairmaster first. Therefore, he has to use the Exercise Bike first and Sangeeta would have used the Stairmaster first. The second machine of Rakesh cannot be the Treadmill because of iii, and it could not be Stairmaster because Piyush was using it. Therefore, his second machine has to be Elliptical since he has already used the Exercise Bike.

Sangeeta has to use the Treadmill as her second machine because none of the others can use it. Prakash will use the Exercise Bike after using the Treadmill first.

From v, Prakash would have used the Elliptical immediately after using Exercise Bike. Sangeeta has to use the Exercise Bike as her third machine because she has already used Stairmaster and Treadmill. Piyush has to use the Treadmill as his third machine because that is the only option available to him. Therefore, Rakesh would have used the Stairmaster as his third machine.

Everyone would have used the remaining machine as their fourth. The following table gives the order in which they used the machines.

Prakash	Treadmill	Exercise Bike	Elliptical	Stairmaster
Sangeeta	Stairmaster	Treadmill	Exercise Bike	Elliptical
Piyush	Elliptical	Stairmaster	Treadmill	Exercise Bike
Rakesh	Exercise Bike	Elliptical	Stairmaster	Treadmill

The first person to use the Stairmaster was Sangeeta.

Choice (A)

undefined

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

Today morning, four persons – Prakash, Sangeeta, Piyush and Rakesh – arrived at the gym at the same time to exercise. Each of them exercised for the same amount of time on each of four machines, the Treadmill, the Elliptical, the Exercise Bike and the Stairmaster, exactly once. There is only one machine of each type present in the gym and only one person can use one machine at a time. No other members of the gym (other than these four persons) used any of the four machines today and none of the four persons waited for any machine. Also, none of the four machines was idle for any time until all the four persons had finished exercising on all the four machines. Further, it is known that

- i. Sangeeta could not use the Treadmill first because Prakash used it.
- ii. Rakesh used each of the Treadmill and the Stairmaster after Sangeeta finished using them.
- iii. Piyush used the Elliptical first, followed immediately by the Stairmaster.
- iv. Prakash used the Elliptical immediately after Sangeeta finished using the Treadmill

**Q6. DIRECTIONS for questions 5 to 8:** Select the correct alternative from the given choices.

Who among the following used the maximum number of machines immediately after Piyush finished using them?

a)

Prakash

b)

Sangeeta

c)

Rakesh

Your answer is correct

d)

Cannot be determined

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>39</b>
Avg. time spent on this question by all students	<b>141</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>152</b>
% of students who attempted this question	<b>44.76</b>
% of students who got the question right of those who attempted	<b>60</b>

[Video Solution](#)

[Text Solution](#)

From ii, Prakash was using the Treadmill first. From iv, Piyush used Elliptical first. From iii, Rakesh could not have used the Treadmill or Stairmaster first. Therefore, he has to use the Exercise Bike first and Sangeeta would have used the Stairmaster first. The second machine of Rakesh cannot be the Treadmill because of iii, and it could not be Stairmaster because Piyush was using it. Therefore, his second machine has to be Elliptical since he has already used the Exercise Bike.

Sangeeta has to use the Treadmill as her second machine because none of the others can use it. Prakash will use the Exercise Bike after using the Treadmill first.

From v, Prakash would have used the Elliptical immediately after using Exercise Bike. Sangeeta has to use the Exercise Bike as her third machine because she has already used Stairmaster and Treadmill. Piyush has to use the Treadmill as his third machine because that is the only option available to him. Therefore, Rakesh would have used the Stairmaster as his third machine.

Everyone would have used the remaining machine as their fourth. The following table gives the order in which they used the machines.

Prakash	Treadmill	Exercise Bike	Elliptical	Stairmaster
Sangeeta	Stairmaster	Treadmill	Exercise Bike	Elliptical
Piyush	Elliptical	Stairmaster	Treadmill	Exercise Bike
Rakesh	Exercise Bike	Elliptical	Stairmaster	Treadmill

Rakesh used three machines immediately after Piyush finished using them.

Choice (C)

undefined

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

Today morning, four persons – Prakash, Sangeeta, Piyush and Rakesh – arrived at the gym at the same time to exercise. Each of them exercised for the same amount of time on each of four machines, the Treadmill, the Elliptical, the Exercise Bike and the Stairmaster, exactly once. There is only one machine of each type present in the gym and only one person can use one machine at a time. No other members of the gym (other than these four persons) used any of the four machines today and none of the four persons waited for any machine. Also, none of the four machines was idle for any time until all the four persons had finished exercising on all the four machines. Further, it is known that

- i. Sangeeta could not use the Treadmill first because Prakash used it.
- ii. Rakesh used each of the Treadmill and the Stairmaster after Sangeeta finished using them.
- iii. Piyush used the Elliptical first, followed immediately by the Stairmaster.
- iv. Prakash used the Elliptical immediately after Sangeeta finished using the Treadmill

**Q7. DIRECTIONS for questions 5 to 8:** Select the correct alternative from the given choices.

Which of the following is the correct order in which any of the four persons had used the machines?

a)

Treadmill, Elliptical, Exercise Bike, Stairmaster

b)

Stairmaster, Treadmill, Elliptical, Exercise Bike

c)

Treadmill, Exercise Bike, Stairmaster, Elliptical

d)

Exercise Bike, Elliptical, Stairmaster, Treadmill

Your answer is correct

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>94</b>
Avg. time spent on this question by all students	<b>116</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>110</b>
% of students who attempted this question	<b>48.36</b>
% of students who got the question right of those who attempted	<b>65.79</b>

[Video Solution](#)

[Text Solution](#)

From ii, Prakash was using the Treadmill first. From iv, Piyush used Elliptical first. From iii, Rakesh could not have used the Treadmill or Stairmaster first. Therefore, he has to use the Exercise Bike first and Sangeeta would have used the Stairmaster first. The second machine of Rakesh cannot be the Treadmill because of iii, and it could not be Stairmaster because Piyush was using it. Therefore, his second machine has to be Elliptical since he has already used the Exercise Bike.

Sangeeta has to use the Treadmill as her second machine because none of the others can use it. Prakash will use the Exercise Bike after using the Treadmill first.

From v, Prakash would have used the Elliptical immediately after using Exercise Bike. Sangeeta has to use the Exercise Bike as her third machine because she has already used Stairmaster and Treadmill. Piyush has to use the Treadmill as his third machine because that is the only option available to him. Therefore, Rakesh would have used the Stairmaster as his third machine.

Everyone would have used the remaining machine as their fourth. The following table gives the order in which they used the machines.

Prakash	Treadmill	Exercise Bike	Elliptical	Stairmaster
Sangeeta	Stairmaster	Treadmill	Exercise Bike	Elliptical
Piyush	Elliptical	Stairmaster	Treadmill	Exercise Bike
Rakesh	Exercise Bike	Elliptical	Stairmaster	Treadmill

Option D was the order in which Rakesh used the machines.

Choice (D)

undefined

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

Today morning, four persons – Prakash, Sangeeta, Piyush and Rakesh – arrived at the gym at the same time to exercise. Each of them exercised for the same amount of time on each of four machines, the Treadmill, the Elliptical, the Exercise Bike and the Stairmaster, exactly once. There is only one machine of each type present in the gym and only one person can use one machine at a time. No other members of the gym (other than these four persons) used any of the four machines today and none of the four persons waited for any machine. Also, none of the four machines was idle for any time until all

the four persons had finished exercising on all the four machines. Further, it is known that

- i. Sangeeta could not use the Treadmill first because Prakash used it.
- ii. Rakesh used each of the Treadmill and the Stairmaster after Sangeeta finished using them.
- iii. Piyush used the Elliptical first, followed immediately by the Stairmaster.
- iv. Prakash used the Elliptical immediately after Sangeeta finished using the Treadmill

**Q8. DIRECTIONS** for questions 5 to 8: Select the correct alternative from the given choices.

If everyone started exercising at 4:30 p.m. and they changed machines exactly after 25 minutes, what machine would Prakash be using at 5:35 p.m.?

a)

Treadmill

b)

Elliptical

Your answer is correct

c)

Exercise Bike

d)

Stairmaster

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>84</b>
Avg. time spent on this question by all students	<b>76</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>71</b>
% of students who attempted this question	<b>47.01</b>
% of students who got the question right of those who attempted	<b>68.76</b>

[Video Solution](#)

[Text Solution](#)

From ii, Prakash was using the Treadmill first. From iv, Piyush used Elliptical first. From iii, Rakesh could not have used the Treadmill or Stairmaster first. Therefore, he has to use the Exercise Bike first and Sangeeta would have used the Stairmaster first. The second machine of Rakesh cannot be the Treadmill because of iii, and it could not be Stairmaster because Piyush was using it. Therefore, his second machine has to be Elliptical since he has already used the Exercise Bike.

Sangeeta has to use the Treadmill as her second machine because none of the others can use it. Prakash will use the Exercise Bike after using the Treadmill first.

From v, Prakash would have used the Elliptical immediately after using Exercise Bike. Sangeeta has to use the Exercise Bike as her third machine because she has already used Stairmaster and Treadmill. Piyush has to use the Treadmill as his third machine because that is the only option available to him. Therefore, Rakesh would have used the Stairmaster as his third machine.

Everyone would have used the remaining machine as their fourth. The following table gives the order in which they used the machines.

Prakash	Treadmill	Exercise Bike	Elliptical	Stairmaster
Sangeeta	Stairmaster	Treadmill	Exercise Bike	Elliptical
Piyush	Elliptical	Stairmaster	Treadmill	Exercise Bike
Rakesh	Exercise Bike	Elliptical	Stairmaster	Treadmill

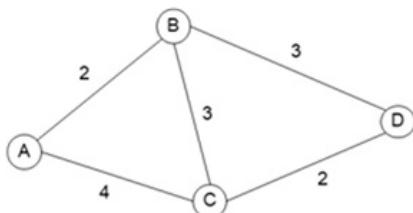
Prakash would have used the Treadmill from 4:30 p.m. to 4:55 p.m., the Exercise Bike from 4:55 p.m. to 5:20 p.m., the Elliptical from 5:20 p.m. to 5:45 PM. Therefore, he would have been using the Elliptical at 5:35 p.m.

Choice (B)

undefined

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

Four towers, A B, C and D, are connected by bridges as shown in the figure below. The length of each bridge (in km) is also provided in the figure.



- i. Each bridge can bear the weight of only one person at any time and if a person wants to use any bridge on which there is already a person walking, he will wait in the tower until the person on the bridge gets off the bridge.
- ii. Any person walks at a constant pace of 4 kmph while on any bridge.
- iii. Anyone who wants to go from one tower to another will always try to minimize the time that he takes to reach his destination and will decide the route that he wants to take based on the persons present on all the bridges at the time he starts.
- iv. Any person, after deciding the route that he wants to take, will always stick to the same route even if it involves additional waiting time at any of the towers due to condition (i).

The time that any person takes to reach the destination includes the time spent waiting (if any) in the towers.

*In the questions that follow, assume that no person is present on any bridge unless specified otherwise.*

**Q9. DIRECTIONS for question 9:** Type in your answer in the input box provided below the question.

A team of three persons planned to go from A to D. What is the minimum time (in minutes) for all the three persons to reach D?

Elliptical

Exercise Bike

Stairmaster

You did not answer this question [Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>56</b>
Avg. time spent on this question by all students	<b>345</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>352</b>
% of students who attempted this question	<b>36.05</b>
% of students who got the question right of those who attempted	<b>25.99</b>

[Video Solution](#)

[Text Solution](#)

The available routes from A to D are:

A – B – D: 5 km

A – C – D: 6 km

A – B – C – D: 7 km

A – C – B – D: 10 km

The first person will travel along the shortest route, i.e., along A-B-D. He will reach B at the end of 30<sup>th</sup> minute and D at the end of the 75<sup>th</sup> minute.

The second person can travel along A-C-D or wait until the first person reaches B and then travel along A-B-D. Among these two options, the first option is quicker. Hence, the second person will travel along A-C-D. This person will reach at the end of the 90<sup>th</sup> minute.

The third person can start at 30 minutes from A. He can travel along A-B and reach B by the end of the 60<sup>th</sup> minute. From here, he can wait till the first person reaches D and travel along B-D or he can travel along B-C and C-D. Among these two options, the first option will minimize the time taken for him to travel.

Hence, he will travel along B-D and reach D by the end of the 120<sup>th</sup> minute.

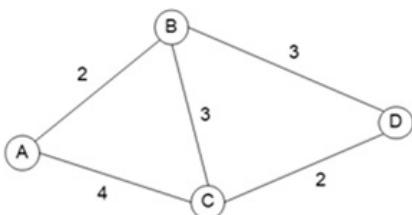
The minimum time required for the three persons to reach D is 120 minutes.

Ans: (120)

undefined

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

Four towers, A B, C and D, are connected by bridges as shown in the figure below. The length of each bridge (in km) is also provided in the figure.



- i. Each bridge can bear the weight of only one person at any time and if a person wants to use any bridge on which there is already a person walking, he will wait in the tower until the person on the bridge gets off the bridge.
- ii. Any person walks at a constant pace of 4 kmph while on any bridge.
- iii. Anyone who wants to go from one tower to another will always try to minimize the time that he takes to reach his destination and will decide the route that he wants to take based on the persons present on all the bridges at the time he starts.

iv.

Any person, after deciding the route that he wants to take, will always stick to the same route even if it involves additional waiting time at any of the towers due to condition (i).

The time that any person takes to reach the destination includes the time spent waiting (if any) in the towers.

*In the questions that follow, assume that no person is present on any bridge unless specified otherwise.*

**Q10. DIRECTIONS** for questions 10 to 12: Select the correct alternative from the given choices.

A team of six persons planned to go from A to D. What is the minimum time (in minutes) in which all the six persons can reach D?

Assume that the six persons work as a team and it is not necessary to minimize the time taken by each individual of the team.

- a) **200**
- b) **195**
- c) **180**
- d) **175**

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>265</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>265</b>
% of students who attempted this question	<b>10.83</b>
% of students who got the question right of those who attempted	<b>40.53</b>

[Video Solution](#)

#### Text Solution

The available routes from A to D are:

A – B – D: 5 km  
A – C – D: 6 km  
A – B – C – D: 7 km  
A – C – B – D: 10 km

Let the six persons be labelled P1 through P6. Let the time at which the first person starts walking be 0 minutes.

P1 takes the route A – B – D and reaches B at 30<sup>th</sup> minute and D at the 75<sup>th</sup> minute.  
P2 takes the route A – C – D and reaches C at 60<sup>th</sup> minute and D at 90<sup>th</sup> minute.

P3 has to wait till 30<sup>th</sup> minute to use A – B or he has to wait till 60<sup>th</sup> minute to use A – C. Between these two options, he will choose to use A – B as it takes lesser time. He reaches B at 60<sup>th</sup> minute. From here he can use B – C – D or B – D. If he uses B – C – D, he will reach D at 135<sup>th</sup> minute. If he uses B – D, he has to wait till 75<sup>th</sup> minute and reach D by 120<sup>th</sup> minute. If he uses B – D, he will be save 15 minutes but the next person walking along A – B – D will have to wait for 30 minutes. Hence, this person is better off using B – C – D, even if it delays him by 15 minutes.

P4 will use A – B from 60<sup>th</sup> to 90<sup>th</sup> minutes and use B – D from 90<sup>th</sup> to 135<sup>th</sup> minute.  
P5 will use A – C from 60<sup>th</sup> to 120<sup>th</sup> minute and C – D from 135<sup>th</sup> to 165<sup>th</sup> minute.  
P6 will use A – B from 90<sup>th</sup> to 120<sup>th</sup> minute and use B – D from 135<sup>th</sup> to 180<sup>th</sup> minute.

The following table provides the time spent by each person on each bridge that he takes to reach D:

Person	A – B	B – D	A – C	C – D	B – C
P1	0 – 30	30 – 75			
P2			0 – 60	60 – 90	
P3	30 – 60			105 – 135	60 – 105
P4	60 – 90	90 – 135			
P5			60 – 120	135 – 165	
P6	90 – 120	135 – 180			

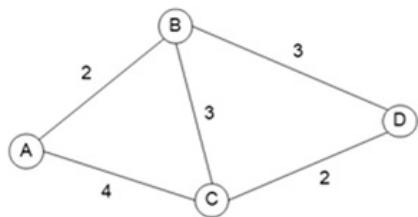
Hence, the sixth person will reach D in 180 minutes.

Choice (C)

undefined

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

Four towers, A B, C and D, are connected by bridges as shown in the figure below. The length of each bridge (in km) is also provided in the figure.



- i. Each bridge can bear the weight of only one person at any time and if a person wants to use any bridge on which there is already a person walking, he will wait in the tower until the person on the bridge gets off the bridge.
- ii. Any person walks at a constant pace of 4 kmph while on any bridge.
- iii. Anyone who wants to go from one tower to another will always try to minimize the time that he takes to reach his destination and will decide the route that he wants to take based on the persons present on all the bridges at the time he starts.
- iv. Any person, after deciding the route that he wants to take, will always stick to the same route even if it involves additional waiting time at any of the towers due to condition (i).

The time that any person takes to reach the destination includes the time spent waiting (if any) in the towers.

*In the questions that follow, assume that no person is present on any bridge unless specified otherwise.*

**Q11. DIRECTIONS** for questions 10 to 12: Select the correct alternative from the given choices.

A team of seven persons planned to go from A to D. What is the minimum time (in minutes) in which all the seven persons can reach D?

Assume that the seven persons work as a team and it is not necessary to minimize the time taken by each individual of the team.

- a) 200
- b) 195
- c) 180
- d) 210

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	0
Avg. time spent on this question by all students	75
Difficulty Level	VD
Avg. time spent on this question by students who got this question right	76
% of students who attempted this question	6.98
% of students who got the question right of those who attempted	25.18

[Video Solution](#)

[Text Solution](#)

From the above solution, we can see that the time required for six persons is 180 minutes. However, for the seventh person to reach D, the sixth person need not take the shortest route.

If the sixth person reaches D by 180<sup>th</sup> minute, the seventh person can use A – B from 120<sup>th</sup> to 150<sup>th</sup> minute. He can wait till 180<sup>th</sup> minute and use B – D from 180<sup>th</sup> minute to 225<sup>th</sup> minute. In this case, he will reach D after 225 minutes. If he uses B – C – D, he cannot reach earlier than this.

However, if the sixth person uses A – B from 90<sup>th</sup> minute till 120<sup>th</sup> minute and then uses B – C from 120<sup>th</sup> minute till 165<sup>th</sup> minute and C – D from 165<sup>th</sup> minute till 195<sup>th</sup> minute, he can reach D by 195<sup>th</sup> minute.

The seventh person can use A – B from 120<sup>th</sup> minute to 150<sup>th</sup> minute and use B – D from 150<sup>th</sup> minute to 195<sup>th</sup> minute. Hence, in this case, the seventh person can reach by 195<sup>th</sup> minute (by delaying the time taken for the sixth person, we can make the time taken for the seventh person to be less).

The following table provides the time spent by each person on each bridge that he takes to reach D:

Person	A – B	B – D	A – C	C – D	B – C
P1	0 – 30	30 – 75			
P2			0 – 60	60 – 90	
P3	30 – 60			105 – 135	60 – 105
P4	60 – 90	90 – 135			
P5			60 – 120	135 – 165	
P6	90 – 120			165 – 195	120 – 165
P7	120 – 150	150 – 195			

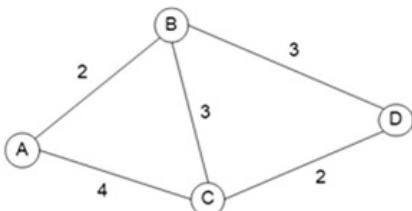
Hence, the minimum time taken for the seven persons to reach D will be 195 minutes.

Choice (B)

undefined

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

Four towers, A B, C and D, are connected by bridges as shown in the figure below. The length of each bridge (in km) is also provided in the figure.



- i. Each bridge can bear the weight of only one person at any time and if a person wants to use any bridge on which there is already a person walking, he will wait in the tower until the person on the bridge gets off the bridge.
- ii. Any person walks at a constant pace of 4 kmph while on any bridge.
- iii. Anyone who wants to go from one tower to another will always try to minimize the time that he takes to reach his destination and will decide the route that he wants to take based on the persons present on all the bridges at the time he starts.
- iv. Any person, after deciding the route that he wants to take, will always stick to the same route even if it involves additional waiting time at any of the towers due to condition (i).

The time that any person takes to reach the destination includes the time spent waiting (if any) in the towers.

*In the questions that follow, assume that no person is present on any bridge unless specified otherwise.*

**Q12. DIRECTIONS** for questions 10 to 12: Select the correct alternative from the given choices.

Kiran started from C to go to B at exactly 11:00 AM. At 11:05 AM, Pavan was in tower C and wanted to go to B.

Exactly x minutes after Kiran started from C, Lohit was in tower C and wanted to go to tower B. If he reached tower B 80 minutes after this, what is the maximum possible value of x?

- a) 35
- b) 45
- c) 15
- d) 10

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	0
Avg. time spent on this question by all students	215
Difficulty Level	D
Avg. time spent on this question by students who got this question right	235
% of students who attempted this question	9.55
% of students who got the question right of those who attempted	34.08

[Video Solution](#)

[Text Solution](#)

Kiran will take the route C – B and reach B by 11:45 AM.

Pavan will take the route C – D – B and reach D by 11:35 AM and reach B by 12:20 PM.

Irrespective of when Lohit was in tower C, to reach tower B, he must take C – B because by using this route, he will reach B by 12:30 PM. If he takes the route C – D – B, he will reach B only by 12:50 PM.

If he takes the route C – A – B, he will reach B earliest by 12:30 PM. In this case, he can't reach B within 80 minutes (as he will take 90 minutes for this route).

Since he will take 45 minutes for walking, and since he took 80 minutes to reach C, he must have spent 35 minutes waiting. Hence, Lohit must have been in tower B by 11:10 AM.

The only possible value of x is 10 minutes (since he was in tower B ten minutes after Kiran started from tower B). Choice (D)

undefined

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

On an overcast Sunday morning, a young man robbed a store and escaped. Rajiv, the police officer assigned for the case, arrived at the crime scene and, upon investigating, found that the robber had brown hair, was of brown complexion, had a mole on his right cheek and wore a pink coloured eye patch over his left eye.

Rajiv returned back to the police headquarters and tried searching the database for the person matching the description provided above. However, the database had only partial information about the persons. Based on the partial information from the database, Rajiv deduced that the robber must be one of the seven persons among Amit, Lalit, Rishi, Bill, Gourav, Hari and Lokesh.

Among the seven persons,

- o three persons have black hair and four persons have brown hair;
- o four persons are of brown complexion and three persons are of olive complexion;
- o three persons have a mole on their right cheeks, while four persons have a mole on their left cheeks;

- four persons wear an eye patch over their left eye and three persons wear an eye patch over their right eye;
- five persons wear a pink eye patch and two persons wear a black eye patch.

He gathered the following additional information from the database:

- For no two persons are all the above mentioned characteristics the same.
- Rishi, who has the same complexion as Bill, wears his eye patch on a different eye as compared to Bill.
- Lalit has black hair, has a mole on his left cheek and wears an eye patch over his right eye.
- There are exactly two persons who have black hair and a mole on their right cheek, and exactly three persons who wear pink eye patch and have brown hair.
- There are exactly three persons who have a mole on their right cheek and wear an eye patch over their left eye.
- There are exactly three persons who wear an eye patch over their right eye and have brown complexion.
- Bill wears a black eye patch, while Lokesh is of brown complexion.
- Amit has a mole on his left cheek, while Gaurav does not wear a black eye patch.

**Q13. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

Who among the following wears a black eye patch?

- a) **Lokesh**
- b) **Hari**
- c) **Amit**
- d) **Lalit**

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>39</b>
Avg. time spent on this question by all students	<b>647</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>744</b>
% of students who attempted this question	<b>7.63</b>
% of students who got the question right of those who attempted	<b>24.8</b>

[Video Solution](#)

[Text Solution](#)

From (iv), two persons have black hair and a mole on their right cheek. Hence, the third person with black hair must have a mole on his left cheek. Among the persons with brown hair, one must have a mole on his right cheek, while three must have mole on their left cheeks.

From (v), three persons have a mole on their right cheek and wear eye patch over left eye. However, there are only three persons who have mole on their right cheek. Hence, all these three persons must be wearing eye patch over their left eye.

From (iii), Lalit has black hair, mole on his left cheek and eye patch over right eye. However, there is only one person with black hair and mole on left cheek. Hence, this person must be Lalit.

Also, the robber has brown hair, has mole on right cheek, and is of brown complexion. However, there is only one person who has mole on right cheek and has brown hair. Hence, this person must have brown complexion. This person has an eye patch over the left eye and must be the robber.

Among the three persons with Brown hair and mole on left cheek, there must be two persons with eye patch over their right eye and one person with eye patch over their left eye.

The following diagram provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
	Black		Right	Left	
	Black		Right	Left	
Lalit	Black		Left	Right	
	Brown	Brown	Right	Left	
	Brown		Left	Left	
	Brown		Left	Right	
	Brown		Left	Right	

From (vi), everyone who wears an eye patch over right eye is of brown complexion. Hence, the remaining three persons must be of olive complexion.

From (i), no two persons have the same characteristics. Hence, among the first two persons in the table above, one person must wear Pink eye patch and one person Black eye patch.

Among the last two persons, one must have a pink eye patch and one must have a black eye patch. Since there are two persons with black eye patches, the remaining persons must have pink eye patches.

From (ii), Rishi has the same complexion as Bill but wears his eye patch on a different side. All the persons with Olive complexions wear eye patches on the left eye. Hence, Rishi and Bill must both be of Brown complexions.

From (vii), Bill wears black eye patch. There is only one person with brown complexion and black eye patch. Hence, Bill must be this person. Rishi has to be of Brown complexion and must wear eye patch on left eye. There is only one person who satisfies this condition. This must be Rishi.

Among the remaining persons, there is only one person left of a Brown complexion. From (vii), this must be Lokesh. Among the remaining persons, there is only one person with a mole on the left cheek. This must be Amit (from (viii)). Among the remaining persons there is only one person who does not wear a Black eye patch and this must be Gaurav. The last person must be Hari.

The following table provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
Gaurav	Black	Olive	Right	Left	Pink
Hari	Black	Olive	Right	Left	Black
Lalit	Black	Brown	Left	Right	Pink
Rishi	Brown	Brown	Right	Left	Pink
Amit	Brown	Olive	Left	Left	Pink
Lokesh	Brown	Brown	Left	Right	Pink
Bill	Brown	Brown	Left	Right	Black

Hari wears a Black eye patch.

Choice (B)

undefined

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

On an overcast Sunday morning, a young man robbed a store and escaped. Rajiv, the police officer assigned for the case, arrived at the crime scene and, upon investigating, found that the robber had brown hair, was of brown complexion, had a mole on his right cheek and wore a pink coloured eye patch over his left eye.

Rajiv returned back to the police headquarters and tried searching the database for the person matching the description provided above. However, the database had only partial information about the persons. Based on the partial information from the database, Rajiv deduced that the robber must be one of the seven persons among Amit, Lalit, Rishi, Bill, Gourav, Hari and Lokesh.

Among the seven persons,

- three persons have black hair and four persons have brown hair;
- four persons are of brown complexion and three persons are of olive complexion;
- three persons have a mole on their right cheeks, while four persons have a mole on their left cheeks;
- four persons wear an eye patch over their left eye and three persons wear an eye patch over their right eye;
- five persons wear a pink eye patch and two persons wear a black eye patch.

He gathered the following additional information from the database:

- i. For no two persons are all the above mentioned characteristics the same.
  - ii. Rishi, who has the same complexion as Bill, wears his eye patch on a different eye as compared to Bill.
  - iii. Lalit has black hair, has a mole on his left cheek and wears an eye patch over his right eye.
  - iv. There are exactly two persons who have black hair and a mole on their right cheek, and exactly three persons who wear pink eye patch and have brown hair.
  - v. There are exactly three persons who have a mole on their right cheek and wear an eye patch over their left eye.
  - vi. There are exactly three persons who wear an eye patch over their right eye and have brown complexion.
  - vii. Bill wears a black eye patch, while Lokesh is of brown complexion.
- iii. Amit has a mole on his left cheek, while Gaurav does not wear a black eye patch.

**Q14. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

Who among the seven persons is the robber?

- a) **Lokesh**
- b) **Rishi**
- c) **Amit**
- d) **Hari**

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>110</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>108</b>
% of students who attempted this question	<b>7.8</b>
% of students who got the question right of those who attempted	<b>37.83</b>

[Video Solution](#)

[Text Solution](#)

From (iv), two persons have black hair and a mole on their right cheek. Hence, the third person with black hair must have a mole on his left cheek. Among the persons with brown hair, one must have a mole on his right cheek, while three must have mole on their left cheeks.

From (v), three persons have a mole on their right cheek and wear eye patch over left eye. However, there are only three persons who have mole on their right cheek. Hence, all these three persons must be wearing eye patch over their left eye.

From (iii), Lalit has black hair, mole on his left cheek and eye patch over right eye. However, there is only one person with black hair and mole on left cheek. Hence, this person must be Lalit.

Also, the robber has brown hair, has mole on right cheek, and is of brown complexion. However, there is only one person who has mole on right cheek and has brown hair. Hence, this person must have brown complexion. This person has an eye patch over the left eye and must be the robber.

Among the three persons with Brown hair and mole on left cheek, there must be two persons with eye patch over their right eye and one person with eye patch over their left eye.

The following diagram provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
	Black		Right	Left	
	Black		Right	Left	
Lalit	Black		Left	Right	
	Brown	Brown	Right	Left	
	Brown		Left	Left	
	Brown		Left	Right	
	Brown		Left	Right	

From (vi), everyone who wears an eye patch over right eye is of brown complexion. Hence, the remaining three persons must be of olive complexion.

From (i), no two persons have the same characteristics. Hence, among the first two persons in the table above, one person must wear Pink eye patch and one person Black eye patch.

Among the last two persons, one must have a pink eye patch and one must have a black eye patch. Since there are two persons with black eye patches, the remaining persons must have pink eye patches.

From (ii), Rishi has the same complexion as Bill but wears his eye patch on a different side. All the persons with Olive complexions wear eye patches on the left eye. Hence, Rishi and Bill must both be of Brown complexions.

From (vii), Bill wears black eye patch. There is only one person with brown complexion and black eye patch. Hence, Bill must be this person. Rishi has to be of Brown complexion and must wear eye patch on left eye. There is only one person who satisfies this condition. This must be Rishi.

Among the remaining persons, there is only one person left of a Brown complexion. From (vii), this must be Lokesh. Among the remaining persons, there is only one person with a mole on the left cheek. This must be Amit (from (viii)). Among the remaining persons there is only one person who does not wear a Black eye patch and this must be Gaurav. The last person must be Hari.

The following table provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
Gaurav	Black	Olive	Right	Left	Pink
Hari	Black	Olive	Right	Left	Black
Lalit	Black	Brown	Left	Right	Pink
Rishi	Brown	Brown	Right	Left	Pink
Amit	Brown	Olive	Left	Left	Pink
Lokesh	Brown	Brown	Left	Right	Pink
Bill	Brown	Brown	Left	Right	Black

Rishi is the robber.

Choice (B)

undefined

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

On an overcast Sunday morning, a young man robbed a store and escaped. Rajiv, the police officer assigned for the case, arrived at the crime scene and, upon investigating, found that the robber had brown hair, was of brown complexion, had a mole on his right cheek and wore a pink coloured eye patch over his left eye.

Rajiv returned back to the police headquarters and tried searching the database for the person matching the description provided above. However, the database had only partial information about the persons. Based on the partial information from the database, Rajiv deduced that the robber must be one of the seven persons among Amit, Lalit, Rishi, Bill, Gourav, Hari and Lokesh.

Among the seven persons,

- three persons have black hair and four persons have brown hair;
- four persons are of brown complexion and three persons are of olive complexion;
- three persons have a mole on their right cheeks, while four persons have a mole on their left cheeks;
- four persons wear an eye patch over their left eye and three persons wear an eye patch over their right eye;
- five persons wear a pink eye patch and two persons wear a black eye patch.

He gathered the following additional information from the database:

- i. For no two persons are all the above mentioned characteristics the same.
  - ii. Rishi, who has the same complexion as Bill, wears his eye patch on a different eye as compared to Bill.
  - iii. Lalit has black hair, has a mole on his left cheek and wears an eye patch over his right eye.
  - iv. There are exactly two persons who have black hair and a mole on their right cheek, and exactly three persons who wear pink eye patch and have brown hair.
  - v. There are exactly three persons who have a mole on their right cheek and wear an eye patch over their left eye.
  - vi. There are exactly three persons who wear an eye patch over their right eye and have brown complexion.
  - vii. Bill wears a black eye patch, while Lokesh is of brown complexion.
- iii. Amit has a mole on his left cheek, while Gaurav does not wear a black eye patch.

**Q15. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

How many persons wear a pink eye patch and have a mole on their right cheek?

- a) 0
- b) 1
- c) 2
- d) More than 2

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>61</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>61</b>
% of students who attempted this question	<b>8.09</b>
% of students who got the question right of those who attempted	<b>37.57</b>

[Video Solution](#)

[Text Solution](#)

From (iv), two persons have black hair and a mole on their right cheek. Hence, the third person with black hair must have a mole on his left cheek. Among the persons with brown hair, one must have a mole on his right cheek, while three must have mole on their left cheeks.

From (v), three persons have a mole on their right cheek and wear eye patch over left eye. However, there are only three persons who have mole on their right cheek. Hence, all these three persons must be wearing eye patch over their left eye.

From (iii), Lalit has black hair, mole on his left cheek and eye patch over right eye. However, there is only one person with black hair and mole on left cheek. Hence, this person must be Lalit.

Also, the robber has brown hair, has mole on right cheek, and is of brown complexion. However, there is only one person who has mole on right cheek and has brown hair. Hence, this person must have brown complexion. This person has an eye patch over the left eye and must be the robber.

Among the three persons with Brown hair and mole on left cheek, there must be two persons with eye patch over their right eye and one person with eye patch over their left eye.

The following diagram provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
	Black		Right	Left	
	Black		Right	Left	
Lalit	Black		Left	Right	
	Brown	Brown	Right	Left	
	Brown		Left	Left	
	Brown		Left	Right	
	Brown		Left	Right	

From (vi), everyone who wears an eye patch over right eye is of brown complexion. Hence, the remaining three persons must be of olive complexion.

From (i), no two persons have the same characteristics. Hence, among the first two persons in the table above, one person must wear Pink eye patch and one person Black eye patch.

Among the last two persons, one must have a pink eye patch and one must have a black eye patch. Since there are two persons with black eye patches, the remaining persons must have pink eye patches.

From (ii), Rishi has the same complexion as Bill but wears his eye patch on a different side. All the persons with Olive complexions wear eye patches on the left eye. Hence, Rishi and Bill must both be of Brown complexions.

From (vii), Bill wears black eye patch. There is only one person with brown complexion and black eye patch. Hence, Bill must be this person. Rishi has to be of Brown complexion and must wear eye patch on left eye. There is only one person who satisfies this condition. This must be Rishi.

Among the remaining persons, there is only one person left of a Brown complexion. From (vii), this must be Lokesh. Among the remaining persons, there is only one person with a mole on the left cheek. This must be Amit (from (viii)). Among the remaining persons there is only one person who does not wear a Black eye patch and this must be Gaurav. The last person must be Hari.

The following table provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
Gaurav	Black	Olive	Right	Left	Pink
Hari	Black	Olive	Right	Left	Black
Lalit	Black	Brown	Left	Right	Pink
Rishi	Brown	Brown	Right	Left	Pink
Amit	Brown	Olive	Left	Left	Pink
Lokesh	Brown	Brown	Left	Right	Pink
Bill	Brown	Brown	Left	Right	Black

Two persons, Gaurav and Rishi, wear a pink eye patch and have a mole on their right cheek.  
Choice (C)

undefined

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

On an overcast Sunday morning, a young man robbed a store and escaped. Rajiv, the police officer assigned for the case, arrived at the crime scene and, upon investigating, found that the robber had brown hair, was of brown complexion, had a mole on his right cheek and wore a pink coloured eye patch over his left eye.

Rajiv returned back to the police headquarters and tried searching the database for the person matching the description provided above. However, the database had only partial information about the persons. Based on the partial information from the database, Rajiv deduced that the robber must be one of the seven persons among Amit, Lalit, Rishi, Bill, Gourav, Hari and Lokesh.

Among the seven persons,

- three persons have black hair and four persons have brown hair;
- four persons are of brown complexion and three persons are of olive complexion;
- three persons have a mole on their right cheeks, while four persons have a mole on their left cheeks;
- four persons wear an eye patch over their left eye and three persons wear an eye patch over their right eye;
- five persons wear a pink eye patch and two persons wear a black eye patch.

He gathered the following additional information from the database:

- i. For no two persons are all the above mentioned characteristics the same.
  - ii. Rishi, who has the same complexion as Bill, wears his eye patch on a different eye as compared to Bill.
  - iii. Lalit has black hair, has a mole on his left cheek and wears an eye patch over his right eye.
  - iv. There are exactly two persons who have black hair and a mole on their right cheek, and exactly three persons who wear pink eye patch and have brown hair.
  - v. There are exactly three persons who have a mole on their right cheek and wear an eye patch over their left eye.
  - vi. There are exactly three persons who wear an eye patch over their right eye and have brown complexion.
  - vii. Bill wears a black eye patch, while Lokesh is of brown complexion.
- iii. Amit has a mole on his left cheek, while Gaurav does not wear a black eye patch.

**Q16. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

Who among the following is of olive complexion and has a mole on his right cheek?

- a) **Gaurav**
- b) **Amit**
- c) **Rishi**
- d) **More than one of the above**

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>57</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>60</b>
% of students who attempted this question	<b>6.29</b>
% of students who got the question right of those who attempted	<b>32.88</b>

[Video Solution](#)

[Text Solution](#)

From (iv), two persons have black hair and a mole on their right cheek. Hence, the third person with black hair must have a mole on his left cheek. Among the persons with brown hair, one must have a mole on his right cheek, while three must have mole on their left cheeks.

From (v), three persons have a mole on their right cheek and wear eye patch over left eye. However, there are only three persons who have mole on their right cheek. Hence, all these three persons must be wearing eye patch over their left eye.

From (iii), Lalit has black hair, mole on his left cheek and eye patch over right eye. However, there is only one person with black hair and mole on left cheek. Hence, this person must be Lalit.

Also, the robber has brown hair, has mole on right cheek, and is of brown complexion. However, there is only one person who has mole on right cheek and has brown hair. Hence, this person must have brown complexion. This person has an eye patch over the left eye and must be the robber.

Among the three persons with Brown hair and mole on left cheek, there must be two persons with eye patch over their right eye and one person with eye patch over their left eye.

The following diagram provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
	Black		Right	Left	
	Black		Right	Left	
Lalit	Black		Left	Right	
	Brown	Brown	Right	Left	
	Brown		Left	Left	
	Brown		Left	Right	
	Brown		Left	Right	

From (vi), everyone who wears an eye patch over right eye is of brown complexion. Hence, the remaining three persons must be of olive complexion.

From (i), no two persons have the same characteristics. Hence, among the first two persons in the table above, one person must wear Pink eye patch and one person Black eye patch.

Among the last two persons, one must have a pink eye patch and one must have a black eye patch. Since there are two persons with black eye patches, the remaining persons must have pink eye patches.

From (ii), Rishi has the same complexion as Bill but wears his eye patch on a different side. All the persons with Olive complexions wear eye patches on the left eye. Hence, Rishi and Bill must both be of Brown complexions.

From (vii), Bill wears black eye patch. There is only one person with brown complexion and black eye patch. Hence, Bill must be this person. Rishi has to be of Brown complexion and must wear eye patch on left eye. There is only one person who satisfies this condition. This must be Rishi.

Among the remaining persons, there is only one person left of a Brown complexion. From (vii), this must be Lokesh. Among the remaining persons, there is only one person with a mole on the left cheek. This must be Amit (from (viii)). Among the remaining persons there is only one person who does not wear a Black eye patch and this must be Gaurav. The last person must be Hari.

The following table provides this information:

Person	Hair Colour	Complexion	Mole	Eye Patch	Eye Patch Colour
Gaurav	Black	Olive	Right	Left	Pink
Hari	Black	Olive	Right	Left	Black
Lalit	Black	Brown	Left	Right	Pink
Rishi	Brown	Brown	Right	Left	Pink
Amit	Brown	Olive	Left	Left	Pink
Lokesh	Brown	Brown	Left	Right	Pink
Bill	Brown	Brown	Left	Right	Black

Gaurav is of olive complexion and has a mole on the right cheek.

Choice (A)

undefined

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

Ramesh was asked to find the GDP, Population and GDP per capita of eight countries – A through H – for the year 2017. However, Ramesh did not know that the GDP per capita of a country is defined as GDP of the country divided by the population of that country. Ramesh searched the internet and obtained the GDP and GDP per capita for each country for the year 2017, but he was not able to obtain

the population. However, he was able to obtain the population of each country for 2016. He decided to submit the assignment with the GDP of 2017, Population of 2016 and GDP per capita of 2017 and made the following table:

Country	GDP in 2017 (in USD bn)	Population in 2016 (in mn)	GDP per capita in 2017 (in USD)
A	650	110	5200
B	480	150	3000
C	350	180	1750
D	740	215	2960
E	950	475	1900
F	240	270	800
G	380	175	2000
H	840	280	2625

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

In 2017, what is the fourth highest population (in mn) of any of the eight countries?

Your Answer:500 □ Your answer is incorrect

Show Correct Answer

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	413
Avg. time spent on this question by all students	419
Difficulty Level	E
Avg. time spent on this question by students who got this question right	421
% of students who attempted this question	48.31
% of students who got the question right of those who attempted	61.27

[Video Solution](#)

[Text Solution](#)

From the given information, we can find the population of the eight countries in 2017, by dividing the GDP with the GDP per capita. The following table provides this information:

Country	GDP in 2017 (in USD bn)	GDP per capita in 2017 (in USD)	Population in 2016 (in mn)	Population in 2017 (in mn)
A	650	5200	110	125
B	480	3000	150	160
C	350	1750	180	200
D	740	2960	215	250
E	950	1900	475	500
F	240	800	270	300
G	380	2000	175	190
H	840	2625	280	320

The fourth highest population in 2017 is 250 mn.

Ans: (250)

undefined

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

Ramesh was asked to find the GDP, Population and GDP per capita of eight countries – A through H – for the year 2017. However, Ramesh did not know that the GDP per capita of a country is defined as GDP of the country divided by the population of that country. Ramesh searched the internet and obtained the GDP and GDP per capita for each country for the year 2017, but he was not able to obtain the population. However, he was able to obtain the population of each country for 2016. He decided to submit the assignment with the GDP of 2017, Population of 2016 and GDP per capita of 2017 and made the following table:

Country	GDP in 2017 (in USD bn)	Population in 2016 (in mn)	GDP per capita in 2017 (in USD)
A	650	110	5200
B	480	150	3000
C	350	180	1750
D	740	215	2960
E	950	475	1900
F	240	270	800
G	380	175	2000
H	840	280	2625

**Q18. DIRECTIONS** for questions 18 to 20: Select the correct alternative from the given choices.

What is the highest percentage increase in the population of any country from 2016 to 2017?

- a) **14.29%**
- b) **13.64%**
- c) **16.28%**
- d) **17.15%**

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>390</b>
Avg. time spent on this question by all students	<b>199</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>199</b>
% of students who attempted this question	<b>37.32</b>
% of students who got the question right of those who attempted	<b>78</b>

[Video Solution](#)

#### Text Solution

From the given information, we can find the population of the eight countries in 2017, by dividing the GDP with the GDP per capita.

The following table provides this information:

Country	GDP in 2017 (in USD bn)	GDP per capita in 2017 (in USD)	Population in 2016 (in mn)	Population in 2017 (in mn)
A	650	5200	110	125
B	480	3000	150	160
C	350	1750	180	200
D	740	2960	215	250
E	950	1900	475	500
F	240	800	270	300
G	380	2000	175	190
H	840	2625	280	320

Only A, C, D and F have more than 10% increase in population. Of these countries, the highest percentage increase is for D, which is equal to  $\frac{35}{215} = 16.28\%$

Choice (C)

undefined

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

Ramesh was asked to find the GDP, Population and GDP per capita of eight countries – A through H – for the year 2017. However, Ramesh did not know that the GDP per capita of a country is defined as GDP of the country divided by the population of that country. Ramesh searched the internet and obtained the GDP and GDP per capita for each country for the year 2017, but he was not able to obtain the population. However, he was able to obtain the population of each country for 2016. He decided to submit the assignment with the GDP of 2017, Population of 2016 and GDP per capita of 2017 and made the following table:

Country	GDP in 2017 (in USD bn)	Population in 2016 (in mn)	GDP per capita in 2017 (in USD)
A	650	110	5200
B	480	150	3000
C	350	180	1750
D	740	215	2960
E	950	475	1900
F	240	270	800
G	380	175	2000
H	840	280	2625

**Q19. DIRECTIONS** for questions 18 to 20: Select the correct alternative from the given choices.

In 2017, how many countries with population more than C have a higher GDP per capita than C?

- a) 3
- b) 2
- c) 4
- d) 5

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	5
Avg. time spent on this question by all students	76
Difficulty Level	E
Avg. time spent on this question by students who got this question right	74
% of students who attempted this question	43.25
% of students who got the question right of those who attempted	82.65

[Video Solution](#)

[Text Solution](#)

From the given information, we can find the population of the eight countries in 2017, by dividing the GDP with the GDP per capita.  
The following table provides this information:

Country	GDP in 2017 (in USD bn)	GDP per capita in 2017 (in USD)	Population in 2016 (in mn)	Population in 2017 (in mn)
A	650	5200	110	125
B	480	3000	150	160
C	350	1750	180	200
D	740	2960	215	250
E	950	1900	475	500
F	240	800	270	300
G	380	2000	175	190
H	840	2625	280	320

The countries with population more than C are D, E, F and H.  
Of these countries, three countries, D, E and H, have higher GDP per capita than C.  
Choice (A)

undefined

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

Ramesh was asked to find the GDP, Population and GDP per capita of eight countries – A through H – for the year 2017. However, Ramesh did not know that the GDP per capita of a country is defined as GDP of the country divided by the population of that country. Ramesh searched the internet and obtained the GDP and GDP per capita for each country for the year 2017, but he was not able to obtain the population. However, he was able to obtain the population of each country for 2016. He decided to submit the assignment with the GDP of 2017, Population of 2016 and GDP per capita of 2017 and made the following table:

Country	GDP in 2017 (in USD bn)	Population in 2016 (in mn)	GDP per capita in 2017 (in USD)
A	650	110	5200
B	480	150	3000
C	350	180	1750
D	740	215	2960
E	950	475	1900
F	240	270	800
G	380	175	2000
H	840	280	2625

**Q20. DIRECTIONS** for questions 18 to 20: Select the correct alternative from the given choices.

If the GDP of each of the eight countries remained constant from 2016 to 2017, which country had the lowest GDP per capita in 2016?

- a) F
- b) B
- c) H
- d) C

You did not answer this question

Show Correct Answer

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	2
Avg. time spent on this question by all students	128
Difficulty Level	E
Avg. time spent on this question by students who got this question right	127
% of students who attempted this question	39.9
% of students who got the question right of those who attempted	85.34

[Video Solution](#)

#### Text Solution

From the given information, we can find the population of the eight countries in 2017, by dividing the GDP with the GDP per capita.  
The following table provides this information:

Country	GDP in 2017 (in USD bn)	GDP per capita in 2017 (in USD)	Population in 2016 (in mn)	Population in 2017 (in mn)
A	650	5200	110	125
B	480	3000	150	160
C	350	1750	180	200
D	740	2960	215	250
E	950	1900	475	500
F	240	800	270	300
G	380	2000	175	190
H	840	2625	280	320

The GDP per capita was the lowest in 2017 for F. The next lowest GDP per capita is almost twice that of F (at 1500). Hence, F will still have the lowest GDP per capita.

Choice (A)

undefined

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

Kiran, a doctor, wanted to find out the height and weight of each patient admitted in his hospital. He created a form with these two fields, gave a copy of the form to each patient and asked each patient to fill this data. However, while all the patients duly entered their heights and weights in the form, they did not necessarily fill them in the respective fields. In the table below, each pair of values in parenthesis provides the height (in inches) and the weight (in kg) of a patient, in no particular order, along with the Patient ID.

Patient ID	Height & Weight
1	(48, 52)
2	(72, 60)
3	(65, 65)
4	(69, 74)
5	(72, 64)

Patient ID	Height & Weight
6	(58, 64)
7	(56, 62)
8	(52, 53)
9	(48, 48)
10	(75, 73)

Patient ID	Height & Weight
11	(48, 58)
12	(67, 68)
13	(42, 48)
14	(45, 54)
15	(62, 58)

It is known that among the patients who weigh less than 50 kg, there are exactly 2 patients shorter than 55 inches; among the patients who weigh less than 60 kg, there are exactly 6 patients shorter than 65 inches; among the patients who weigh less than 70 kg, there are exactly 11 patients shorter than 75 inches.

**Q21. DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

How many patients weigh less than 70 kg but are taller than 70 inches?

a) 0   Your answer is correct

- b) 1
- c) 2
- d) 3

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>738</b>
Avg. time spent on this question by all students	<b>353</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>599</b>
% of students who attempted this question	<b>21.82</b>
% of students who got the question right of those who attempted	<b>20.53</b>

[Video Solution](#)

[Text Solution](#)

It is given that there are 2 patients weighing less than 50 kg and shorter than 55 inches. From the table, we can see that patients 9 and 13 will definitely weigh less than 50 kg and will be shorter than 55 inches.

Hence, these are the 2 patients who satisfy this condition.

Patient 1 will not satisfy this condition. If his weight is 48 kg, he will satisfy the condition. Hence, his weight cannot be 48 kg. Therefore, his height is 48 inches and weight is 52 kg.

For Patient 14, the weight cannot be 48 kg (as he cannot satisfy the above condition). Hence, the height of Patient 14 will be 45 inches and the weight must be 54 kg.

Also given that there are 6 patients weighing less than 60 kg and shorter than 65 inches.

Patient 1, Patient 9, Patient 13 and Patient 14 definitely satisfy this condition (as seen from above). In addition to this, Patient 8 and Patient 11 also will satisfy. Hence, these 6 patients will satisfy this condition and no one else should.

Patient 6 cannot weigh less than 60 kg. Hence, Patient 6 must weigh 64 kg and his height must be 58 inches.

Similarly, for Patient 7, his height must be 56 inches and weight must be 62 kg.

Similarly, for Patient 15, his height must be 58 inches and weight must be 62 kg.

From the third condition, there must be 11 patients weighing less than 70 kg and with height less than 75 inches.

Patients 1, 6, 7, 8, 9, 11, 13, 14 and 15 already satisfy this condition. Hence, there must be 9 more patients satisfying this condition.

Patient 3 definitely satisfies this condition. Patient 12 definitely satisfies this condition. Hence, no one else must satisfy this condition.

For Patient 2, the height must be 60 inches and weight must be 72 kg.

For Patient 4, the height must be 69 inches and weight must be 74 kg.

For Patient 5, the height must be 64 inches and weight must be 72 kg.

The following table provides the height and weight of the persons that can be determined:

Patient ID	Height	Weight
1	48	52
2	60	72
3	65	65
4	69	74
5	64	72

Patient ID	Height	Weight
6	58	64
7	56	62
8	52/53	53/52
9	48	48
10	75/73	73/75

Patient ID	Height	Weight
11	48/58	58/48
12	67/68	68/67
13	42/48	48/42
14	45	54
15	58	62

None of the patients weigh less than 70 kg and are taller than 70 inches.

Choice (A)

undefined

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

Kiran, a doctor, wanted to find out the height and weight of each patient admitted in his hospital. He created a form with these two fields, gave a copy of the form to each patient and asked each patient to fill this data. However, while all the patients duly entered their heights and weights in the form, they did not necessarily fill them in the respective fields. In the table below, each pair of values in parenthesis provides the height (in inches) and the weight (in kg) of a patient, in no particular order, along with the Patient ID.

Patient ID	Height & Weight
1	(48, 52)
2	(72, 60)
3	(65, 65)
4	(69, 74)
5	(72, 64)

Patient ID	Height & Weight
6	(58, 64)
7	(56, 62)
8	(52, 53)
9	(48, 48)
10	(75, 73)

Patient ID	Height & Weight
11	(48, 58)
12	(67, 68)
13	(42, 48)
14	(45, 54)
15	(62, 58)

It is known that among the patients who weigh less than 50 kg, there are exactly 2 patients shorter than 55 inches; among the patients who weigh less than 60 kg, there are exactly 6 patients shorter than 65 inches; among the patients who weigh less than 70 kg, there are exactly 11 patients shorter than 75 inches.

**Q22. DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

What is the difference (in kg) between the weights of Patient 5 and Patient 14?

- a) **10**
- b) **18**
- c) **19**
- d) **Cannot be determined**

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>162</b>
Avg. time spent on this question by all students	<b>74</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>69</b>
% of students who attempted this question	<b>19.25</b>
% of students who got the question right of those who attempted	<b>23.52</b>

[Video Solution](#)

[Text Solution](#)

It is given that there are 2 patients weighing less than 50 kg and shorter than 55 inches. From the table, we can see that patients 9 and 13 will definitely weigh less than 50 kg and will be shorter than 55 inches.

Hence, these are the 2 patients who satisfy this condition.

Patient 1 will not satisfy this condition. If his weight is 48 kg, he will satisfy the condition. Hence, his weight cannot be 48 kg. Therefore, his height is 48 inches and weight is 52 kg.

For Patient 14, the weight cannot be 48 kg (as he cannot satisfy the above condition). Hence, the height of Patient 14 will be 45 inches and the weight must be 54 kg.

Also given that there are 6 patients weighing less than 60 kg and shorter than 65 inches.

Patient 1, Patient 9, Patient 13 and Patient 14 definitely satisfy this condition (as seen from above). In addition to this, Patient 8 and Patient 11 also will satisfy. Hence, these 6 patients will satisfy this condition and no one else should.

Patient 6 cannot weigh less than 60 kg. Hence, Patient 6 must weigh 64 kg and his height must be 58 inches.

Similarly, for Patient 7, his height must be 56 inches and weight must be 62 kg.

Similarly, for Patient 15, his height must be 58 inches and weight must be 62 kg.

From the third condition, there must be 11 patients weighing less than 70 kg and with height less than 75 inches.

Patients 1, 6, 7, 8, 9, 11, 13, 14 and 15 already satisfy this condition. Hence, there must be 9 more patients satisfying this condition.

Patient 3 definitely satisfies this condition. Patient 12 definitely satisfies this condition. Hence, no one else must satisfy this condition.

For Patient 2, the height must be 60 inches and weight must be 72 kg.

For Patient 4, the height must be 69 inches and weight must be 74 kg.

For Patient 5, the height must be 64 inches and weight must be 72 kg.

The following table provides the height and weight of the persons that can be determined:

Patient ID	Height	Weight	Patient ID	Height	Weight	Patient ID	Height	Weight
1	48	52	6	58	64	11	48/58	58/48
2	60	72	7	56	62	12	67/68	68/67
3	65	65	8	52/53	53/52	13	42/48	48/42
4	69	74	9	48	48	14	45	54
5	64	72	10	75/73	73/75	15	58	62

The difference between the weights of Patient 5 and Patient 14 =  $72 - 54 = 18$  kg  
Choice (B)

undefined

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

Kiran, a doctor, wanted to find out the height and weight of each patient admitted in his hospital. He created a form with these two fields, gave a copy of the form to each patient and asked each patient to fill this data. However, while all the patients duly entered their heights and weights in the form, they did not necessarily fill them in the respective fields. In the table below, each pair of values in parenthesis provides the height (in inches) and the weight (in kg) of a patient, in no particular order, along with the Patient ID.

Patient ID	Height & Weight
1	(48, 52)
2	(72, 60)
3	(65, 65)
4	(69, 74)
5	(72, 64)

Patient ID	Height & Weight
6	(58, 64)
7	(56, 62)
8	(52, 53)
9	(48, 48)
10	(75, 73)

Patient ID	Height & Weight
11	(48, 58)
12	(67, 68)
13	(42, 48)
14	(45, 54)
15	(62, 58)

It is known that among the patients who weigh less than 50 kg, there are exactly 2 patients shorter than 55 inches; among the patients who weigh less than 60 kg, there are exactly 6 patients shorter than 65 inches; among the patients who weigh less than 70 kg, there are exactly 11 patients shorter than 75 inches.

**Q23. DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

Among the patients shorter than Patient 12, how many are heavier than Patient 7?

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

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	0
Avg. time spent on this question by all students	129
Difficulty Level	D
Avg. time spent on this question by students who got this question right	132
% of students who attempted this question	13.24
% of students who got the question right of those who attempted	25.3

[Video Solution](#)

[Text Solution](#)

It is given that there are 2 patients weighing less than 50 kg and shorter than 55 inches. From the table, we can see that patients 9 and 13 will definitely weigh less than 50 kg and will be shorter than 55 inches.

Hence, these are the 2 patients who satisfy this condition.

Patient 1 will not satisfy this condition. If his weight is 48 kg, he will satisfy the condition. Hence, his weight cannot be 48 kg. Therefore, his height is 48 inches and weight is 52 kg.

For Patient 14, the weight cannot be 48 kg (as he cannot satisfy the above condition). Hence, the height of Patient 14 will be 45 inches and the weight must be 54 kg.

Also given that there are 6 patients weighing less than 60 kg and shorter than 65 inches.

Patient 1, Patient 9, Patient 13 and Patient 14 definitely satisfy this condition (as seen from above). In addition to this, Patient 8 and Patient 11 also will satisfy. Hence, these 6 patients will satisfy this condition and no one else should.

Patient 6 cannot weigh less than 60 kg. Hence, Patient 6 must weigh 64 kg and his height must be 58 inches.

Similarly, for Patient 7, his height must be 56 inches and weight must be 62 kg.

Similarly, for Patient 15, his height must be 58 inches and weight must be 62 kg.

From the third condition, there must be 11 patients weighing less than 70 kg and with height less than 75 inches.

Patients 1, 6, 7, 8, 9, 11, 13, 14 and 15 already satisfy this condition. Hence, there must be 9 more patients satisfying this condition.

Patient 3 definitely satisfies this condition. Patient 12 definitely satisfies this condition. Hence, no one else must satisfy this condition.

For Patient 2, the height must be 60 inches and weight must be 72 kg.

For Patient 4, the height must be 69 inches and weight must be 74 kg.

For Patient 5, the height must be 64 inches and weight must be 72 kg.

The following table provides the height and weight of the persons that can be determined:

Patient ID	Height	Weight	Patient ID	Height	Weight	Patient ID	Height	Weight
1	48	52	6	58	64	11	48/58	58/48
2	60	72	7	56	62	12	67/68	68/67
3	65	65	8	52/53	53/52	13	42/48	48/42
4	69	74	9	48	48	14	45	54
5	64	72	10	75/73	73/75	15	58	62

The patients shorter than Patient 12 are patients 1, 2, 3, 5, 6, 7, 8, 9, 11, 13, 14 and 15. Among them, four patients, patients 2, 3, 5, 6 are heavier than Patient 7.

Choice (D)

undefined

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

Kiran, a doctor, wanted to find out the height and weight of each patient admitted in his hospital. He created a form with these two fields, gave a copy of the form to each patient and asked each patient to fill this data. However, while all the patients duly entered their heights and weights in the form, they did not necessarily fill them in the respective fields. In the table below, each pair of values in parenthesis provides the height (in inches) and the weight (in kg) of a patient, in no particular order, along with the Patient ID.

Patient ID	Height & Weight
1	(48, 52)
2	(72, 60)
3	(65, 65)
4	(69, 74)
5	(72, 64)

Patient ID	Height & Weight
6	(58, 64)
7	(56, 62)
8	(52, 53)
9	(48, 48)
10	(75, 73)

Patient ID	Height & Weight
11	(48, 58)
12	(67, 68)
13	(42, 48)
14	(45, 54)
15	(62, 58)

It is known that among the patients who weigh less than 50 kg, there are exactly 2 patients shorter than 55 inches; among the patients who weigh less than 60 kg, there are exactly 6 patients shorter than 65 inches; among the patients who weigh less than 70 kg, there are exactly 11 patients shorter than 75 inches.

**Q24. DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

How many of the following can be the average height of the fifteen patients?

I. 56.2

II. 57.2

III. 57.6

IV. 58.0

V. 59.1

a) **4**

b) **3**

c) **2**

d) **1**

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>166</b>
Difficulty Level	<b>VD</b>
Avg. time spent on this question by students who got this question right	<b>162</b>
% of students who attempted this question	<b>6.71</b>
% of students who got the question right of those who attempted	<b>28.56</b>

[Video Solution](#)

[Text Solution](#)

It is given that there are 2 patients weighing less than 50 kg and shorter than 55 inches. From the table, we can see that patients 9 and 13 will definitely weigh less than 50 kg and will be shorter than 55 inches.  
Hence, these are the 2 patients who satisfy this condition.  
Patient 1 will not satisfy this condition. If his weight is 48 kg, he will satisfy the condition. Hence, his weight cannot be 48 kg. Therefore, his height is 48 inches and weight is 52 kg.

For Patient 14, the weight cannot be 48 kg (as he cannot satisfy the above condition). Hence, the height of Patient 14 will be 45 inches and the weight must be 54 kg.  
Also given that there are 6 patients weighing less than 60 kg and shorter than 65 inches.

Patient 1, Patient 9, Patient 13 and Patient 14 definitely satisfy this condition (as seen from above). In addition to this, Patient 8 and Patient 11 also will satisfy. Hence, these 6 patients will satisfy this condition and no one else should.

Patient 6 cannot weigh less than 60 kg. Hence, Patient 6 must weigh 64 kg and his height must be 58 inches.

Similarly, for Patient 7, his height must be 56 inches and weight must be 62 kg.

Similarly, for Patient 15, his height must be 58 inches and weight must be 62 kg.

From the third condition, there must be 11 patients weighing less than 70 kg and with height less than 75 inches.

Patients 1, 6, 7, 8, 9, 11, 13, 14 and 15 already satisfy this condition. Hence, there must be 9 more patients satisfying this condition.

Patient 3 definitely satisfies this condition. Patient 12 definitely satisfies this condition.  
Hence, no one else must satisfy this condition.

For Patient 2, the height must be 60 inches and weight must be 72 kg.

For Patient 4, the height must be 69 inches and weight must be 74 kg.

For Patient 5, the height must be 64 inches and weight must be 72 kg.

The following table provides the height and weight of the persons that can be determined:

Patient ID	Height	Weight	Patient ID	Height	Weight	Patient ID	Height	Weight
1	48	52	6	58	64	11	48/58	58/48
2	60	72	7	56	62	12	67/68	68/67
3	65	65	8	52/53	53/52	13	42/48	48/42
4	69	74	9	48	48	14	45	54
5	64	72	10	75/73	73/75	15	58	62

The minimum average height of the patients will be  $\frac{853}{15} = 56.87$

The maximum average height of the patients will be  $\frac{873}{15} = 58.2$

Among the given options, options II, III and IV fall in this range.

However, from the possibilities, from the minimum possible weight, the weight can increase by 1 kg (for Patient 8), by 2 kg (for Patient 10), by 10 kg (for Patient 11), by 1 kg (for Patient 12), by 6 kg (for Patient 13).

For the average weight to be 57.2, the total weight must be  $57.2 \times 15 = 858$ .

This is 5 kg more than the minimum possible total (i.e., 853 kg). This is not possible for any combination of the weights of the patients mentioned above.

For the average weight to be 57.6, the total weight must be  $57.6 \times 15 = 864$  kg

This is 11 kg more than the minimum possible weight. This total is possible if weights of Patient 11 and Patient 8/12 are higher. Hence, this value is possible.

For the average weight to be 58, the total weight must be  $58 \times 15 = 870$ .

This is 17 kg more than the minimum weight. This total is possible if the weights of Patient 11, Patient 13 and Patient 8/12 are higher. Hence, this is also possible.

Therefore, two values (III and IV) are possible. Choice (C)

undefined

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

A group of professors gave a few seminars at a conference, which was conducted across two days, Day 1 and Day 2. Each professor gave not more than one seminar on each of Robotics and Nanotechnology. Further, each professor gave not more than one seminar on each of Day 1 or Day 2. Each seminar was given by exactly one professor.

The following information is known about the seminars given by the professors:

- i. The number of professors who gave a seminar on Robotics on Day 1 is twice the number of professors who gave a seminar on Nanotechnology on Day 1.
- ii. The number of seminars given on Robotics is eight more than the number of seminars given on Nanotechnology.
- iii. The number of professors who gave a seminar on Day 2 is six more than the number of professors who gave a seminar on Day 1.

iv.

The total number of seminars given by the professors who gave a seminar on Robotics is twenty more than the number of seminars on Nanotechnology on Day 2.

v.

The number of seminars given on Robotics on Day 1 is the same as the number of seminars given on Robotics on Day 2.

vi.

Exactly four professors gave a seminar on Robotics on Day 1 and on Nanotechnology on Day 2.

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

How many seminars were given, in all, by the professors during the two days?

**Your Answer:**40 □ **Your answer is incorrect**

[Show Correct Answer](#)

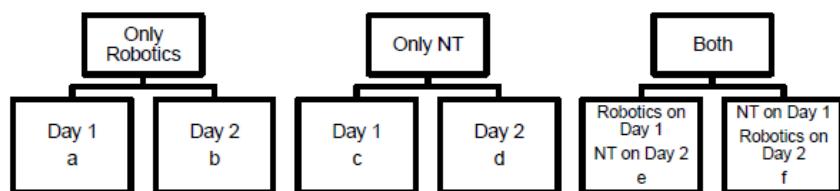
**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>560</b>
Avg. time spent on this question by all students	<b>393</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>441</b>
% of students who attempted this question	<b>13.3</b>
% of students who got the question right of those who attempted	<b>10.79</b>

[Video Solution](#)

[Text Solution](#)

The following diagram represents the number of professors who gave a seminar on each subject and on each day:



From (vi),  $e = 4$

$$\text{From (i), } a + e = 2(c + f) \Rightarrow a + 4 = 2c + 2f \quad \dots \dots \dots (1)$$

$$\text{From (ii), } a + b + e + f = 8 + c + d + e + f \Rightarrow a + b = 8 + c + d \quad \dots \dots \dots (2)$$

$$\text{From (iii), } b + d + e + f = 6 + a + c + e + f \Rightarrow b + d = 6 + a + c \quad \dots \dots \dots (3)$$

$$\text{From (iv), } a + b + 2e + 2f = 20 + d + e \Rightarrow a + b + 2f = 16 + d \quad \dots \dots \dots (4)$$

$$\text{From (v), } a + e = b + f \Rightarrow a + 4 = b + f \quad \dots \dots \dots (5)$$

$$\text{From (1) and (5), } b = 2c + f$$

$$\text{From (2), } a + 2c + f = 8 + c + d \Rightarrow a + c + f = 8 + d$$

$$\text{From (3), } 2c + f + d = 6 + a + c \Rightarrow a + 6 = c + f + d$$

$$\text{From the above two equations, } 8 + d - c - f = c + f + d - 6 \Rightarrow 2c + 2f = 14 \Rightarrow c + f = 7$$

$$a + 4 = 2c + 2f \Rightarrow a = 10$$

$$a + 6 = c + f + d \Rightarrow 10 + 6 = 7 + d \Rightarrow d = 9$$

$$\text{Since } b = 2c + f, \ b = 7 + c$$

$$\text{From (4), } a + 7 + c + 2f = 16 + d \Rightarrow c + 2f = 8$$

$$\text{Hence, } c = 6 \text{ and } f = 1 \text{ and } b = 13$$

$$\text{i. The total number of seminars given} = a + b + c + d + 2e + 2f = 48$$

Ans: (48)

undefined

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

A group of professors gave a few seminars at a conference, which was conducted across two days, Day 1 and Day 2. Each professor gave not more than one seminar on each of Robotics and Nanotechnology. Further, each professor gave not more than one seminar on each of Day 1 or Day 2. Each seminar was given by exactly one professor.

The following information is known about the seminars given by the professors:

i.

The number of professors who gave a seminar on Robotics on Day 1 is twice the number of professors who gave a seminar on Nanotechnology on Day 1.

- ii. The number of seminars given on Robotics is eight more than the number of seminars given on Nanotechnology.
- iii. The number of professors who gave a seminar on Day 2 is six more than the number of professors who gave a seminar on Day 1.
- iv. The total number of seminars given by the professors who gave a seminar on Robotics is twenty more than the number of seminars on Nanotechnology on Day 2.
- v. The number of seminars given on Robotics on Day 1 is the same as the number of seminars given on Robotics on Day 2.
- vi. Exactly four professors gave a seminar on Robotics on Day 1 and on Nanotechnology on Day 2.

**Q26. DIRECTIONS** for questions 26 to 28: Select the correct alternative from the given choices.

How many seminars on Robotics were given on Day 2?

- a) **11**
- b) **12**  Your answer is incorrect
- c) **13**
- d) **14**

Show Correct Answer

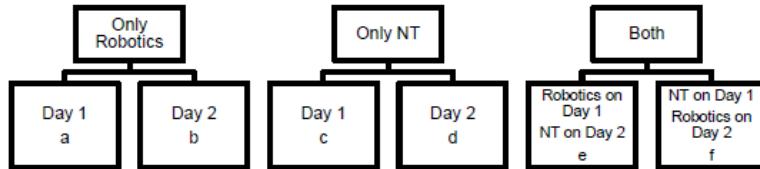
**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>25</b>
Avg. time spent on this question by all students	<b>79</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>71</b>
% of students who attempted this question	<b>7.36</b>
% of students who got the question right of those who attempted	<b>33.64</b>

[Video Solution](#)

[Text Solution](#)

The following diagram represents the number of professors who gave a seminar on each subject and on each day:



From (vi),  $e = 4$

$$\text{From (i), } a + e = 2(c + f) \Rightarrow a + 4 = 2c + 2f \quad \dots \dots \dots (1)$$

$$\text{From (ii), } a + b + e + f = 8 + c + d + e + f \Rightarrow a + b = 8 + c + d \quad \dots \dots \dots (2)$$

$$\text{From (iii), } b + d + e + f = 6 + a + c + e + f \Rightarrow b + d = 6 + a + c \quad \dots \dots \dots (3)$$

$$\text{From (iv), } a + b + 2e + 2f = 20 + d + e \Rightarrow a + b + 2f = 16 + d \quad \dots \dots \dots (4)$$

$$\text{From (v), } a + e = b + f \Rightarrow a + 4 = b + f \quad \dots \dots \dots (5)$$

$$\text{From (1) and (5), } b = 2c + f$$

$$\text{From (2), } a + 2c + f = 8 + c + d \Rightarrow a + c + f = 8 + d$$

$$\text{From (3), } 2c + f + d = 6 + a + c \Rightarrow a + 6 = c + f + d$$

$$\text{From the above two equations, } 8 + d - c - f = c + f + d - 6 \Rightarrow 2c + 2f = 14 \Rightarrow c + f = 7$$

$$a + 4 = 2c + 2f \Rightarrow a = 10$$

$$a + 6 = c + f + d \Rightarrow 10 + 6 = 7 + d \Rightarrow d = 9$$

$$\text{Since } b = 2c + f, \ b = 7 + c$$

$$\text{From (4), } a + 7 + c + 2f = 16 + d \Rightarrow c + 2f = 8$$

$$\text{Hence, } c = 6 \text{ and } f = 1 \text{ and } b = 13$$

14 (i.e., b + f) seminars on Robotics were given on Day 2.

Choice (D)

undefined

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

A group of professors gave a few seminars at a conference, which was conducted across two days, Day 1 and Day 2. Each professor gave not more than one seminar on each of Robotics and Nanotechnology. Further, each professor gave not more than one seminar on each of Day 1 or Day 2. Each seminar was given by exactly one professor.

The following information is known about the seminars given by the professors:

- i. The number of professors who gave a seminar on Robotics on Day 1 is twice the number of professors who gave a seminar on Nanotechnology on Day 1.
- ii. The number of seminars given on Robotics is eight more than the number of seminars given on Nanotechnology.
- iii. The number of professors who gave a seminar on Day 2 is six more than the number of professors who gave a seminar on Day 1.
- iv. The total number of seminars given by the professors who gave a seminar on Robotics is twenty more than the number of seminars on Nanotechnology on Day 2.
- v. The number of seminars given on Robotics on Day 1 is the same as the number of seminars given on Robotics on Day 2.
- vi. Exactly four professors gave a seminar on Robotics on Day 1 and on Nanotechnology on Day 2.

**Q27. DIRECTIONS** for questions 26 to 28: Select the correct alternative from the given choices.

How many professors gave a seminar on Nanotechnology on Day 1 and a seminar on Robotics on Day 2?

- a) 1
  - b) 2
  - c) 4
  - d) 5

You did not answer this question

### Show Correct Answer

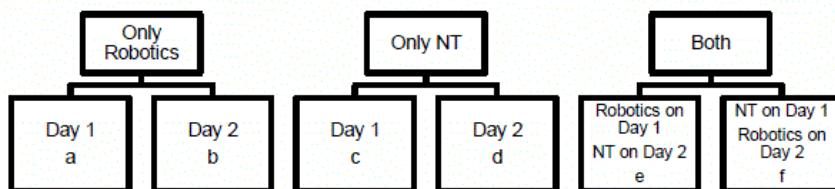
## Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>83</b>
Avg. time spent on this question by all students	<b>60</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>101</b>
% of students who attempted this question	<b>5.45</b>
% of students who got the question right of those who attempted	<b>9.02</b>

## Video Solution

## Text Solution

The following diagram represents the number of professors who gave a seminar on each subject and on each day:



From (vi),  $e = 4$

$$\text{From (i), } a + e = 2(c + f) \Rightarrow a + 4 = 2c + 2f \quad \dots \dots \dots (1)$$

From (ii),  $a + b + e + f = 8 + c + d + e + f \Rightarrow a + b = 8 + c + d$  --- (2)

From (iii),  $b + d + e + f = 6 + a + c + e + f \Rightarrow b + d = 6 + a + c$  -----  
 (3)

$$\text{From (iv), } a + b + 2e + 2f = 20 + d + e \Rightarrow a + b + 2f = 16 + d \quad \dots \dots \dots (4)$$

From (1) and (5),  $b = 2c + f$

$$\text{From (2), } a + 2c + f = 8 + c + d \Rightarrow a + c + f = 8 + d$$

From (3),  $2c + f + d = 6 + a + c \Rightarrow a + 6 = c + f + d$

From the above two equations,  $8 + d - c - f = c + f + d - 6 \Rightarrow 2c + 2f = 14 \Rightarrow c + f = 7$

$$a + 6 = c + f + d \Rightarrow 10 + 6 = 7 + d \Rightarrow d = 9$$

Since  $b = 2c + f$ ,  $b = 7 + c$

$$\text{From (4), } a + 7 + c + 2f = 16 + d \Rightarrow c + 2f = 8$$

Hence,  $c = 6$  and  $f = 1$  and  $b = 13$

Only 1 professor gave a seminar on Nanotechnology on Day 1 and a seminar on Robotics on Day 2.

undefined

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

A group of professors gave a few seminars at a conference, which was conducted across two days, Day 1 and Day 2. Each professor gave not more than one seminar on each of Robotics and Nanotechnology. Further, each professor gave not more than one seminar on each of Day 1 or Day 2. Each seminar was given by exactly one professor.

The following information is known about the seminars given by the professors:

- i. The number of professors who gave a seminar on Robotics on Day 1 is twice the number of professors who gave a seminar on Nanotechnology on Day 1.
- ii. The number of seminars given on Robotics is eight more than the number of seminars given on Nanotechnology.
- iii. The number of professors who gave a seminar on Day 2 is six more than the number of professors who gave a seminar on Day 1.
- iv. The total number of seminars given by the professors who gave a seminar on Robotics is twenty more than the number of seminars on Nanotechnology on Day 2.
- v. The number of seminars given on Robotics on Day 1 is the same as the number of seminars given on Robotics on Day 2.
- vi. Exactly four professors gave a seminar on Robotics on Day 1 and on Nanotechnology on Day 2.

**Q28. DIRECTIONS** for questions 26 to 28: Select the correct alternative from the given choices.

What is the total number of seminars given by the professors on Day 1?

- a) **16**
- b) **18**
- c) **21**
- d) **24** Your answer is incorrect

**Show Correct Answer**

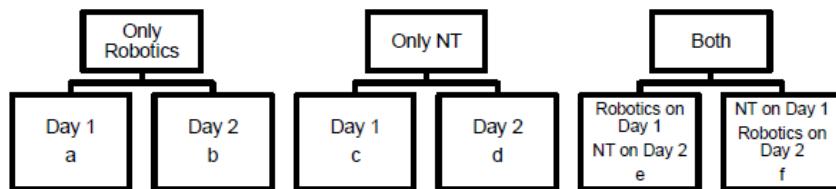
**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>64</b>
Avg. time spent on this question by all students	<b>45</b>
Difficulty Level	<b>D</b>
Avg. time spent on this question by students who got this question right	<b>32</b>
% of students who attempted this question	<b>5.68</b>
% of students who got the question right of those who attempted	<b>33.93</b>

[Video Solution](#)

[Text Solution](#)

The following diagram represents the number of professors who gave a seminar on each subject and on each day:



From (vi),  $e = 4$

$$\text{From (i), } a + e = 2(c + f) \Rightarrow a + 4 = 2c + 2f \quad \dots \dots \dots (1)$$

$$\text{From (ii), } a + b + e + f = 8 + c + d + e + f \Rightarrow a + b = 8 + c + d \quad \dots \dots \dots (2)$$

$$\text{From (iii), } b + d + e + f = 6 + a + c + e + f \Rightarrow b + d = 6 + a + c \quad \dots \dots \dots (3)$$

$$\text{From (iv), } a + b + 2e + 2f = 20 + d + e \Rightarrow a + b + 2f = 16 + d \quad \dots \dots \dots (4)$$

$$\text{From (v), } a + e = b + f \Rightarrow a + 4 = b + f \quad \dots \dots \dots (5)$$

$$\text{From (1) and (5), } b = 2c + f$$

$$\text{From (2), } a + 2c + f = 8 + c + d \Rightarrow a + c + f = 8 + d$$

$$\text{From (3), } 2c + f + d = 6 + a + c \Rightarrow a + 6 = c + f + d$$

$$\text{From the above two equations, } 8 + d - c - f = c + f + d - 6 \Rightarrow 2c + 2f = 14 \Rightarrow c + f = 7$$

$$a + 4 = 2c + 2f \Rightarrow a = 10$$

$$a + 6 = c + f + d \Rightarrow 10 + 6 = 7 + d \Rightarrow d = 9$$

$$\text{Since } b = 2c + f, \ b = 7 + c$$

$$\text{From (4), } a + 7 + c + 2f = 16 + d \Rightarrow c + 2f = 8$$

$$\text{Hence, } c = 6 \text{ and } f = 1 \text{ and } b = 13$$

$$\text{Total number of seminars on Day 1} = a + c + e + f = 21$$

Choice (C)

undefined

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

Seven persons, A through G, live in the same house. Among the seven persons are five siblings and the spouses of two of the siblings. The seven persons are each of a different age. None of the seven persons have any siblings other than those living in the house.

The following information is known about the seven persons:

- i. G, who is younger than F, has at least one younger brother, while neither B nor G are married.
- ii. There are exactly four persons younger than the spouse of one of the siblings living in the house.
- iii. There are exactly three persons younger than B and the brother-in-law of B is older than G.
- iv. C has at least two sisters and at least one of C's siblings is older than C.
- v. The wife of D is younger than E but is not a sibling of E, while E is a younger brother of B.

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

Who is the oldest female among the seven?

- a) G
- b) B
- c) F

d) C

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	136
Avg. time spent on this question by all students	515
Difficulty Level	M
Avg. time spent on this question by students who got this question right	674
% of students who attempted this question	16.32
% of students who got the question right of those who attempted	27.8

[Video Solution](#)

[Text Solution](#)

Given that G and B are not married. C has two sisters. D has a wife. E is a brother of B. From all this, we can infer that the five siblings must be G, B, C, D and E. Hence, the spouses must be A and F.

From (ii), B is the fourth oldest. From (ii), one of the spouses is the third oldest. From (v), D's wife and E are both younger than B. Hence, the other spouse must be either the fifth or sixth or seventh oldest.

From (i), G is not the oldest. If G is the second oldest, then the brother-in-law of B must be the oldest. However, this is not possible as neither of the two spouses can be the oldest. G also cannot be the third oldest because G is not married.

Hence, G must be younger than B. Therefore, G, E and D's wife must be younger than B. The other siblings, C and D, must be older than B.

Since D's wife is younger than E and G is not the youngest, D's wife must be the youngest. G and E can be the fifth and sixth oldest in any order. However, from (i), G has at least one brother younger than him. This is only possible if E is a male and he is younger than G. Hence, G is the fifth oldest and E is the sixth oldest.

D's wife must be either A or F. But D's wife cannot be F because F is older than G (from (i)).

Hence, D's wife must be A.

The oldest three persons must be F, C and D in any order. Since F is the spouse of one of the siblings, F must be the third oldest. From (iv), C has at least one sibling older than C. Hence, C must be the second oldest and D must be the oldest.

Also, C has two sisters. Of the siblings, D and E are both male. Hence, B and G must both be female.

F's spouse cannot be D or E (since they are males) or G or B (as G and B are not married). Hence, F's spouse must be C. F must be B's brother-in-law and F must be married to C, who must be a female.

The following table provides this information:

Order from Oldest to Youngest	Gender	Spouse
D	Male	Husband of A
C	Female	Wife of F
F	Male	Husband of C
B	Female	
G	Female	
E	Male	
A	Female	Wife of D

The oldest female among the seven is C.

Choice (D)

undefined

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

Seven persons, A through G, live in the same house. Among the seven persons are five siblings and the spouses of two of the siblings. The seven persons are each of a different age. None of the seven persons have any siblings other than those living in the house.

The following information is known about the seven persons:

- i. G, who is younger than F, has at least one younger brother, while neither B nor G are married.
- ii. There are exactly four persons younger than the spouse of one of the siblings living in the house.
- iii. There are exactly three persons younger than B and the brother-in-law of B is older than G.
- iv. C has at least two sisters and at least one of C's siblings is older than C.
- v. The wife of D is younger than E but is not a sibling of E, while E is a younger brother of B.

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

Who is the spouse of the third oldest person?

- a) **D**
- b) **C**
- c) **F**
- d) **A**

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>81</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>77</b>
% of students who attempted this question	<b>11.23</b>
% of students who got the question right of those who attempted	<b>39.84</b>

[Video Solution](#)

[Text Solution](#)

Given that G and B are not married. C has two sisters. D has a wife. E is a brother of B. From all this, we can infer that the five siblings must be G, B, C, D and E.

Hence, the spouses must be A and F.

From (ii), B is the fourth oldest. From (ii), one of the spouses is the third oldest. From (v), D's wife and E are both younger than B. Hence, the other spouse must be either the fifth or sixth or seventh oldest.

From (i), G is not the oldest. If G is the second oldest, then the brother-in-law of B must be the oldest. However, this is not possible as neither of the two spouses can be the oldest. G also cannot be the third oldest because G is not married.

Hence, G must be younger than B. Therefore, G, E and D's wife must be younger than B. The other siblings, C and D, must be older than B.

Since D's wife is younger than E and G is not the youngest, D's wife must be the youngest. G and E can be the fifth and sixth oldest in any order. However, from (i), G has at least one brother younger than him. This is only possible if E is a male and he is younger than G. Hence, G is the fifth oldest and E is the sixth oldest.

D's wife must be either A or F. But D's wife cannot be F because F is older than G (from (i)).

Hence, D's wife must be A.

The oldest three persons must be F, C and D in any order. Since F is the spouse of one of the siblings, F must be the third oldest. From (iv), C has at least one sibling older than C. Hence, C must be the second oldest and D must be the oldest.

Also, C has two sisters. Of the siblings, D and E are both male. Hence, B and G must both be female.

F's spouse cannot be D or E (since they are males) or G or B (as G and B are not married). Hence, F's spouse must be C. F must be B's brother-in-law and F must be married to C, who must be a female.

The following table provides this information:

Order from Oldest to Youngest	Gender	Spouse
D	Male	Husband of A
C	Female	Wife of F
F	Male	Husband of C
B	Female	
G	Female	
E	Male	
A	Female	Wife of D

The spouse of the third oldest person (F) is C.

Choice (B)

undefined

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

Seven persons, A through G, live in the same house. Among the seven persons are five siblings and the spouses of two of the siblings. The seven persons are each of a different age. None of the seven persons have any siblings other than those living in the house.

The following information is known about the seven persons:

- i. G, who is younger than F, has at least one younger brother, while neither B nor G are married.
- ii. There are exactly four persons younger than the spouse of one of the siblings living in the house.
- iii. There are exactly three persons younger than B and the brother-in-law of B is older than G.
- iv. C has at least two sisters and at least one of C's siblings is older than C.
- v. The wife of D is younger than E but is not a sibling of E, while E is a younger brother of B.

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

How many persons younger than F are married?

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

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	0
Avg. time spent on this question by all students	36
Difficulty Level	M
Avg. time spent on this question by students who got this question right	32
% of students who attempted this question	12.61
% of students who got the question right of those who attempted	48.27

[Video Solution](#)

[Text Solution](#)

Given that G and B are not married. C has two sisters. D has a wife. E is a brother of B. From all this, we can infer that the five siblings must be G, B, C, D and E.

Hence, the spouses must be A and F.

From (ii), B is the fourth oldest. From (ii), one of the spouses is the third oldest. From (v), D's wife and E are both younger than B. Hence, the other spouse must be either the fifth or sixth or seventh oldest.

From (i), G is not the oldest. If G is the second oldest, then the brother-in-law of B must be the oldest. However, this is not possible as neither of the two spouses can be the oldest. G also cannot be the third oldest because G is not married.

Hence, G must be younger than B. Therefore, G, E and D's wife must be younger than B. The other siblings, C and D, must be older than B.

Since D's wife is younger than E and G is not the youngest, D's wife must be the youngest. G and E can be the fifth and sixth oldest in any order. However, from (i), G has at least one brother younger than him. This is only possible if E is a male and he is younger than G. Hence, G is the fifth oldest and E is the sixth oldest.

D's wife must be either A or F. But D's wife cannot be F because F is older than G (from (i)).

Hence, D's wife must be A.

The oldest three persons must be F, C and D in any order. Since F is the spouse of one of the siblings, F must be the third oldest. From (iv), C has at least one sibling older than C. Hence, C must be the second oldest and D must be the oldest.

Also, C has two sisters. Of the siblings, D and E are both male. Hence, B and G must both be female.

F's spouse cannot be D or E (since they are males) or G or B (as G and B are not married). Hence, F's spouse must be C. F must be B's brother-in-law and F must be married to C, who must be a female.

The following table provides this information:

Order from Oldest to Youngest	Gender	Spouse
D	Male	Husband of A
C	Female	Wife of F
F	Male	Husband of C
B	Female	
G	Female	
E	Male	
A	Female	Wife of D

Only one person younger than F is married.

Choice (C)

undefined

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

Seven persons, A through G, live in the same house. Among the seven persons are five siblings and the spouses of two of the siblings. The seven persons are each of a different age. None of the seven persons have any siblings other than those living in the house.

The following information is known about the seven persons:

i.

G, who is younger than F, has at least one younger brother, while neither B nor G are married.

ii.

There are exactly four persons younger than the spouse of one of the siblings living in the house.

- iii. There are exactly three persons younger than B and the brother-in-law of B is older than G.
- iv. C has at least two sisters and at least one of C's siblings is older than C.
- v. The wife of D is younger than E but is not a sibling of E, while E is a younger brother of B.

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

Who among the following is a younger sister of G?

- a) **B**
- b) **E**
- c) **C**
- d) **None of the above**

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>0</b>
Avg. time spent on this question by all students	<b>108</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>90</b>
% of students who attempted this question	<b>11.06</b>
% of students who got the question right of those who attempted	<b>55.54</b>

[Video Solution](#)

[Text Solution](#)

Given that G and B are not married. C has two sisters. D has a wife. E is a brother of B. From all this, we can infer that the five siblings must be G, B, C, D and E.

Hence, the spouses must be A and F.

From (ii), B is the fourth oldest. From (ii), one of the spouses is the third oldest. From (v), D's wife and E are both younger than B. Hence, the other spouse must be either the fifth or sixth or seventh oldest.

From (i), G is not the oldest. If G is the second oldest, then the brother-in-law of B must be the oldest. However, this is not possible as neither of the two spouses can be the oldest. G also cannot be the third oldest because G is not married.

Hence, G must be younger than B. Therefore, G, E and D's wife must be younger than B. The other siblings, C and D, must be older than B.

Since D's wife is younger than E and G is not the youngest, D's wife must be the youngest. G and E can be the fifth and sixth oldest in any order. However, from (i), G has at least one brother younger than him. This is only possible if E is a male and he is younger than G. Hence, G is the fifth oldest and E is the sixth oldest.

D's wife must be either A or F. But D's wife cannot be F because F is older than G (from (i)).

Hence, D's wife must be A.

The oldest three persons must be F, C and D in any order. Since F is the spouse of one of the siblings, F must be the third oldest. From (iv), C has at least one sibling older than C. Hence, C must be the second oldest and D must be the oldest.

Also, C has two sisters. Of the siblings, D and E are both male. Hence, B and G must both be female.

F's spouse cannot be D or E (since they are males) or G or B (as G and B are not married). Hence, F's spouse must be C. F must be B's brother-in-law and F must be married to C, who must be a female.

The following table provides this information:

Order from Oldest to Youngest	Gender	Spouse
D	Male	Husband of A
C	Female	Wife of F
F	Male	Husband of C
B	Female	
G	Female	
E	Male	
A	Female	Wife of D

G does not have any younger sisters.

Choice (D)

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

If  $x > 4$  and  $y > 2$ , which of the following is always true?

- a)  $x > 6 - y$  Your answer is correct
- b)  $x > 2y$
- c)  $x - y \neq 0$
- d)  $x - y > 2$

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>44</b>
Avg. time spent on this question by all students	<b>102</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>101</b>
% of students who attempted this question	<b>60.15</b>
% of students who got the question right of those who attempted	<b>73.37</b>

[Video Solution](#)

[Text Solution](#)

$$\begin{aligned} \text{If } x > 4 \text{ and } y > 2 \\ \Rightarrow x + y > 6 \text{ i.e., } x > 6 - y. \end{aligned}$$

Choice (A)

undefined

**Q2. DIRECTIONS** for questions 2 and 3: Type in your answer in the input box provided below the question.

Three friends, Abhay, Bharat and Chintu, had a total of  $n$  marbles with them. If the product of the number of marbles with each of them is 36, how many distinct values of  $n$  are possible?

**Your Answer:** 6 Your answer is incorrect

[Show Correct Answer](#)

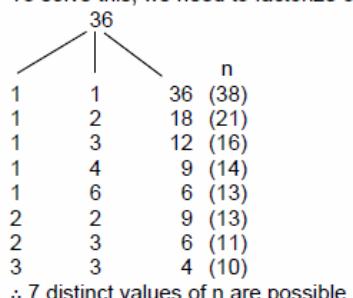
**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>415</b>
Avg. time spent on this question by all students	<b>186</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>247</b>
% of students who attempted this question	<b>51.9</b>
% of students who got the question right of those who attempted	<b>12.63</b>

[Video Solution](#)

[Text Solution](#)

To solve this, we need to factorize 36 and check for the sum.



Ans: (7)

undefined

**Q3. DIRECTIONS** for questions 2 and 3: Type in your answer in the input box provided below the question.

If  $n$  is the smallest positive integer such that  $2000 + n$  is the sum of the cubes of the first  $m$  natural numbers, find the value of  $m + n$ .

You did not answer this question [Show Correct Answer](#)

Time spent / Accuracy Analysis

Time taken by you to answer this question	11
Avg. time spent on this question by all students	179
Difficulty Level	E
Avg. time spent on this question by students who got this question right	174
% of students who attempted this question	29.18
% of students who got the question right of those who attempted	62.59

[Video Solution](#)

[Text Solution](#)

$$\text{The sum of the cubes of the first } 'm' \text{ natural numbers} = \left( \frac{m(m+1)}{2} \right)^2$$

$\frac{m(m+1)}{2}$  can take values of 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, .....

$$\therefore \text{Least } n, \text{ such that } 2000 + n = \left( \frac{m(m+1)}{2} \right)^2$$

will be for  $m = 9$ ,  $\frac{m(m+1)}{2} = 45$ , since  $45^2 > 2000$ .

$$\therefore 2000 + n = 2025 \Rightarrow n = 25 \text{ and } m = 9$$
  
$$\Rightarrow m + n = 34$$

Ans: (34)

undefined

**Q4. DIRECTIONS** for questions 4 and 5: Select the correct alternative from the given choices.

There are two distinct positive numbers  $a$  and  $b$ , such that  $a$  is  $q\%$  greater than  $b$  and  $b$  is  $p\%$  less than  $a$ . If  $a$  is increased by  $p\%$  and then decreased by  $q\%$ , to result in a positive number  $c$ , then which of the following could be true?

- a)  $c > a$
- b)  $c < a$
- c)  $c = a$
- d) Cannot be determined

You did not answer this question [Show Correct Answer](#)

Time spent / Accuracy Analysis

Time taken by you to answer this question	159
Avg. time spent on this question by all students	177
Difficulty Level	M
Avg. time spent on this question by students who got this question right	188
% of students who attempted this question	34.15
% of students who got the question right of those who attempted	48.27

[Video Solution](#)

### Text Solution

$$\begin{aligned}
 a &= b \left(1 + \frac{q}{100}\right) \\
 b &= a \left(1 - \frac{p}{100}\right) \\
 \frac{a}{b} &= \left(1 + \frac{q}{100}\right) = \frac{1}{\left(1 - \frac{p}{100}\right)} \\
 \left(1 - \frac{p}{100}\right) \left(1 + \frac{q}{100}\right) &= 1 \\
 1 - \frac{p}{100} + \frac{q}{100} - \frac{pq}{100} &= 1 \\
 q &= p + pq \quad \text{--- (1)} \\
 c &= a \left(1 + \frac{p}{100}\right) \left(1 - \frac{q}{100}\right) \\
 &= a \left(1 + \frac{p}{100} - \frac{q}{100} - \frac{pq}{100}\right) \\
 &= a \left(1 + \frac{p}{100} - \frac{p}{100} - \frac{pq}{100} - \frac{pq}{100}\right) \\
 c &= a \left(1 - \frac{2pq}{100}\right) \\
 \Rightarrow a > c &
 \end{aligned}$$

As  $a$  and  $b$  are distinct  $p \neq q \neq 0$ , so  $c \neq a$ .

#### Alternative Solution:

Let  $a = 125$  and  $b = 100$

$\Rightarrow p = 25\%$  and  $q = 20\%$

Now if  $a$  is increased by  $q\%$  and decreased by  $p\%$  we get  $125 \times (1.2)(0.75) = 112.5$ , i.e., less than  $a$ .

Hence, choice (B).

Choice (B)

undefined

#### Q5. DIRECTIONS for questions 4 and 5: Select the correct alternative from the given choices.

Two friends, Farhan and Zoya, started from P towards Q at 10:00 am. Each of them, after reaching Q, immediately returned back to P. If Farhan took 6 hours and Zoya took 12 hours for the journey, then at what time did they cross each other?

- a) 1:00 pm
- b) 2:00 pm
- c) 3:00 pm
- d) 6:00 pm

You did not answer this question

Show Correct Answer

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	222
Avg. time spent on this question by all students	203
Difficulty Level	M
Avg. time spent on this question by students who got this question right	201
% of students who attempted this question	53.98
% of students who got the question right of those who attempted	71.12

### Video Solution

### Text Solution

Let the distance between P and Q be 1. When Farhan and Zoya meet, they together would have covered a distance of  $2PQ$ , i.e., 2

$$\text{Speed of Farhan} = \frac{2}{6} = \frac{1}{3}$$

$$\text{Speed of Zoya} = \frac{2}{12} = \frac{1}{6}$$

$\therefore$  Time taken by them to together cover  $2PQ$

$$\frac{2}{\left(\frac{1}{3} + \frac{1}{6}\right)} = 4 \text{ hours}$$

So, they will meet at 2:00 p.m.

Choice (B)

undefined

**Q6. DIRECTIONS** for questions 6 and 7: Type in your answer in the input box provided below the question.

A vessel has 20 litres of a solution of milk and water, containing 25% milk. Now  $n$  litres of milk was added to the vessel, as a result of which the ratio of milk to water was reversed. If  $n$  litres of water is further added to the vessel, find the final percentage of milk in the solution.

**Your Answer:45 Your answer is correct**

Time spent / Accuracy Analysis

Time taken by you to answer this question **254**

Avg. time spent on this question by all students **170**

Difficulty Level **M**

Avg. time spent on this question by students who got this question right **155**

% of students who attempted this question **47.62**

% of students who got the question right of those who attempted **54.47**

[Video Solution](#)

[Text Solution](#)

$$\begin{aligned} \text{The amount of milk in the solution after } n \text{ litres of milk was added} &= n + \frac{25}{100}(20) \\ &= n + 5 \text{ litres} \end{aligned}$$

$$\Rightarrow \text{The fraction of the solution which is water after } n \text{ litres of milk was added} = \frac{15}{n+20}$$

$$\Rightarrow \frac{15}{n+20} = \frac{1}{4} \Rightarrow n = 40$$

Now, the percentage of milk when  $n$  litres of water added

$$= \frac{n+5}{2n+20} \times 100$$

$$= \frac{40+5}{2(40)+20} \times 100 = 45\%$$

Ans: (45)

undefined

**Q7. DIRECTIONS** for questions 6 and 7: Type in your answer in the input box provided below the question.

In a regular polygon, if each interior angle is 12 times that of each exterior angle, find the number of sides of the polygon.

**Your Answer:26 Your answer is correct**

Time spent / Accuracy Analysis

Time taken by you to answer this question

**192**

**Time spent / Accuracy Analysis**

Avg. time spent on this question by all students	<b>128</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>123</b>
% of students who attempted this question	<b>33.37</b>

% of students who got the question right of those who attempted	<b>49.91</b>
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[Video Solution](#)[Text Solution](#)

Let the number of sides of the polygon be 'n'.

$$\text{Sum of the interior angles} = (2n - 4) \times 90^\circ$$

$$\text{Each interior angle} = \frac{(2n - 4) \times 90^\circ}{n}$$

$$\text{Each exterior angle} = \frac{360^\circ}{n}$$

$$(2n - 4) \times 90$$

$$\text{Thus } \frac{n}{\left(\frac{360}{n}\right)} = 12$$

$$\Rightarrow \frac{(2n - 4) \times 90}{360} = 12 \Rightarrow 2n - 4 = 48 \Rightarrow n = 26.$$

**Alternative Solution:**

Since the sum of exterior angles for any polygon =  $360^\circ$ , we can conclude that sum of interior angles of the given polygon =  $12 \times 360^\circ$

$$\Rightarrow \text{sum of interior angles} = (2n - 4) \times 90^\circ = 12 \times 360^\circ$$

$$\Rightarrow 2n - 4 = 48$$

$$\Rightarrow n = 26.$$

Ans: (26)

undefined

**Q8. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

The age of a person was four times the age of his daughter when he was as old as his son is now. If the daughter is now half as old as the son, find the ratio of the ages of the son and the father.

- a) 2 : 3
- b) 3 : 4 Your answer is incorrect
- c) 4 : 5
- d) 7 : 8

[Show Correct Answer](#)**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>184</b>
Avg. time spent on this question by all students	<b>190</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>185</b>
% of students who attempted this question	<b>27.3</b>
% of students who got the question right of those who attempted	<b>69.88</b>

[Video Solution](#)[Text Solution](#)

Let the age of the son be  $4x$ .

The age of the daughter now is  $1/2 \times 4x = 2x$ .

The age of the daughter when the father was as old as the son now was  $\frac{1}{4} \times 4x = x$ .

The number of years passed =  $2x - x$

The present age of father =  $4x + x = 5x$

Ratio of ages of son and father is  $4x : 5x = 4 : 5$ .

Choice (C)

undefined

**Q9. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

A man cheats while buying as well as while selling. While buying he takes 10% more than what he pays for and while selling he gives 20% less than what he claims to. Find his profit percent, if he sells at 9.09% below the cost price of the claimed weight.

- a) 19.81%
- b) 20%
- c) 37.5%
- d) 25%

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	184
Avg. time spent on this question by all students	213
Difficulty Level	E
Avg. time spent on this question by students who got this question right	223
% of students who attempted this question	21.47
% of students who got the question right of those who attempted	40.38

[Video Solution](#)

[Text Solution](#)

The data is tabulated below.

Pays for	Takes
10	11
Gives	Claims to give
8	10

We can combine these ratios into a single chain as shown below

Pays for	Takes & Gives	Claims to give
80	88	110

i.e., if he pays for 80 units, he takes 88 and when he gives these 88, he claims it as 110. He sells at 10/11 of the cost price of the claimed weight.

$\therefore$  He gets the cost price of  $\frac{10}{11}(110)$  or 100 units.

$$\therefore \text{The profit is } \left( \frac{100-80}{80} \right) = \frac{1}{4} = 25\%$$

Choice (D)

undefined

**Q10. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

If the height of a cone is decreased by 20% and its radius is increased by 25%, then what is the percentage increase in the total surface area of the cone?

- a) **25%**
- b) **81.25%**
- c) **22.5%**
- d) **Cannot be determined** Your answer is correct

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>205</b>
Avg. time spent on this question by all students	<b>165</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>146</b>
% of students who attempted this question	<b>26.92</b>
% of students who got the question right of those who attempted	<b>54.92</b>

[Video Solution](#)

#### Text Solution

The total surface area of a cone =  $\pi r^2 + \pi r l$ .

$$\text{Where } l = \sqrt{r^2 + h^2}$$

Given that  $h$  decreases by 20% whereas  $r$  increases by 25%. Now without knowing the ratio of  $r$  and  $h$ , we cannot find the percentage change in  $l$  and thus we cannot determine the percentage change in the total surface area of the cone.

Choice (D)

undefined

**Q11. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

If  $p$  is a natural number, how many values of  $p$  exist such that  $\frac{(2p+1)^2}{2p+7}$  is an integer?

- a) **1**
- b) **3**
- c) **2**
- d) **5**

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>116</b>
Avg. time spent on this question by all students	<b>151</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>153</b>
% of students who attempted this question	<b>28.12</b>
% of students who got the question right of those who attempted	<b>82.22</b>

[Video Solution](#)

#### Text Solution

$$\begin{aligned}\frac{(2p+1)^2}{2p+7} &= \frac{4p^2+4p+1}{2p+7} \\ &= \frac{(2p+7)(2p-5)+36}{2p+7} = 2p-5 + \frac{36}{2p+7}\end{aligned}$$

$\therefore 2p+7$  must be factor of 36.

The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36

Out of these  $2p+7$  can take only one value, i.e., 9, when  $p = 1$  ( $\because p$  has to be a positive integer).

**Alternative Solution:**

To get the remainder when  $(2p+1)^2$  is divided by  $(2p+7)$  we can use remainder

theorem, by writing  $\frac{(2p+1)^2}{(2p+7)}$  as  $\frac{(2p+1)^2}{((2p+1)-(-6))}$ , i.e., remainder  $(-6)^2 = 36$ .

Now 36 must also be divisible by  $2p+7$ .

Hence, only  $p = 1$  is possible.

Choice (A)

undefined

**Q12. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

P and Q can complete a certain piece of work in 24 days and 36 days respectively, when working alone. They work on alternate days, starting with P. Further, they get a holiday after every four days of work and after the holiday, the person who worked on the last day before the holiday, now starts the work. After how many days from the start will the work get completed?

- a) **14  $\frac{2}{5}$  days**
- b) **36 days** Your answer is correct
- c) **35  $\frac{2}{3}$  days**
- d) **18 days**

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>256</b>
Avg. time spent on this question by all students	<b>228</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>224</b>
% of students who attempted this question	<b>39.73</b>
% of students who got the question right of those who attempted	<b>49.25</b>

[Video Solution](#)

[Text Solution](#)

In the first 4 days,  $\frac{1}{24} + \frac{1}{36} + \frac{1}{24} + \frac{1}{36}$  + or  $\frac{5}{36}$  of the work is done.

The 5<sup>th</sup> day is a holiday

In the next 5-day period, Q will start, but work done will still be  $\frac{5}{36}$  in 4 days.

7 such 5 days periods will account for 35/36 of the work

The Remaining work = 1/36 work

Now, it is Q's turn to start after the 7<sup>th</sup> holiday.

He will take 1 day to finish 1/36 work.

So, totally 36 days are needed to complete the work.

Choice (B)

undefined

**Q13. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

Let  $p, q, r$  and  $s$  be four integers having a sum of  $4t + 1$ , where  $t$  is a natural number. Which of the following can be concluded for a known value of  $t$ ?

- a) Maximum possible value of  $p^2 + q^2 + r^2 + s^2$  is  $4t^2 + 2t + 1$
- b) Maximum possible value of  $p^2 + q^2 + r^2 + s^2$  is  $4t^2 - 2t + 1$
- c) Minimum possible value of  $p^2 + q^2 + r^2 + s^2$  is  $4t^2 + 2t + 1$
- d) Minimum possible value of  $p^2 + q^2 + r^2 + s^2$  is  $4t^2 - 2t + 1$

You did not answer this question

Show Correct Answer

Time spent / Accuracy Analysis

Time taken by you to answer this question	9
Avg. time spent on this question by all students	131
Difficulty Level	D
Avg. time spent on this question by students who got this question right	138
% of students who attempted this question	12.15
% of students who got the question right of those who attempted	49.4

[Video Solution](#)

[Text Solution](#)

If the sum of two integers  $a$  and  $b$ , is constant, say  $s$ , then  $E = a^2 + b^2$  does not have any maximum value since either of  $a$  or  $b$  can be made to have opposite signs with arbitrarily large magnitudes. However,  $E$  has its minimum value when both  $a$  and  $b$  are as nearly equal as possible. Similarly, if the sum of 4 positive integers is constant, say  $4t + 1$ , the sum of the squares of the 4 integers has no maximum, but attains its minimum value when they are all as nearly equal as possible i.e.,  $t, t, t$  and  $t + 1$ . The sum of the square of these 4 numbers is  $4t^2 + 2t + 1$ .  $\therefore$  The minimum value of  $p^2 + q^2 + r^2 + s^2$  is  $4t^2 + 2t + 1$ .

Choice (C)

undefined

**Q14. DIRECTIONS** for questions 8 to 14: Select the correct alternative from the given choices.

If  $A_p$  is the sum to the first  $p$  terms of the series  $A = 12^{144} + 12^{143} + 12^{142} + \dots$ , then find  $B_p$ , which is the sum to the first  $p$  terms of the series  $A_1 + A_2 + A_3 + \dots$

- a)  $\frac{12^{145}}{196} \left[ \left( \frac{1}{12} \right)^p + 14p + 1 \right]$
- b)  $12^{143} \left[ \left( \frac{1}{12} \right)^p + 12p - 1 \right]$
- c)  $\frac{12^{145}}{121} \left[ \left( \frac{1}{12} \right)^p + 11p - 1 \right]$
- d)  $\frac{12^{145}}{169} \left[ \left( \frac{1}{12} \right)^p + 13p - 1 \right]$

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	10
Avg. time spent on this question by all students	160
Difficulty Level	M
Avg. time spent on this question by students who got this question right	180
% of students who attempted this question	7.18
% of students who got the question right of those who attempted	67.32

[Video Solution](#)

#### Text Solution

$$A_p = \frac{12^{144} \left[ 1 - \left( \frac{1}{12} \right)^p \right]}{\left( 1 - \frac{1}{12} \right)} \Rightarrow A_p = \frac{12^{145}}{11} \left[ 1 - \left( \frac{1}{12} \right)^p \right]$$

$$B_p = \frac{12^{145}}{11} \left[ \left( 1 - \left( \frac{1}{12} \right)^1 \right) + \left( 1 - \left( \frac{1}{12} \right)^2 \right) + \dots + \left( 1 - \left( \frac{1}{12} \right)^p \right) \right]$$

$$B_p = \frac{12^{145}}{11} \left[ p - \frac{\frac{1}{12} \left( 1 - \left( \frac{1}{12} \right)^p \right)}{\left( 1 - \frac{1}{12} \right)} \right]$$

$$B_p = \frac{12^{145}}{121} \left[ 11p + \left( \frac{1}{12} \right)^p - 1 \right]$$

#### Alternative solution:

Checking for  $p = 1$ , we see that only option (C) satisfies.

Choice (C)

undefined

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

Akhil took a loan of Rs.10,000 from Bharat at a simple interest rate of 10% per annum. Three people Pasha, Quadir and Robert approached him for a loan, offering to pay 7%, 8% and 12% simple interest per annum respectively. If Akhil lent the money in such a way that he will make a profit of 1% on the borrowed sum per year, what is the maximum possible sum (in Rs.) that he might have lent to Robert?

You did not answer this question [Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	15
Avg. time spent on this question by all students	229

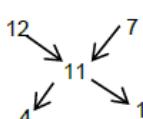
#### Time spent / Accuracy Analysis

Difficulty Level	M
Avg. time spent on this question by students who got this question right	239
% of students who attempted this question	11.85
% of students who got the question right of those who attempted	19.55

[Video Solution](#)

#### Text Solution

As Akhil took the loan at 10% simple interest and made a profit of 1%, the average rate at which he lent should be 11%. The amount lent at the rate of 12% will be maximized when the amount lent at 8% rate of interest is zero.  
Thus by the method of Alligation:



The amount lent at 12% is  $\frac{4}{5} \times 10,000 = ₹8,000$

#### Alternative solution:

Let the amount lent at 12% be  $x$ . The amount lent at 7% be  $10,000 - x$ . (Amount lent at 8% must be zero to maximise the amount lent at 12%)

$$\therefore \frac{12}{100}x + \frac{7}{100}(10,000 - x) = \frac{11}{100} \times 10000$$
$$\Rightarrow x = 8,000$$

Ans: (8000)

undefined

**Q16. DIRECTIONS** for questions 16 to 19: Select the correct alternative from the given choices.

ABCD is a rhombus, in which E and F are the midpoints of BC and CD respectively. If AE =  $\sqrt{83}$  units and BF =  $\sqrt{107}$  units, then find the area of ABCD (in sq units).

- a)  $18\sqrt{13}$
- b)  $16\sqrt{10}$
- c)  $18\sqrt{39}$
- d)  $16\sqrt{22}$

You did not answer this question

[Show Correct Answer](#)

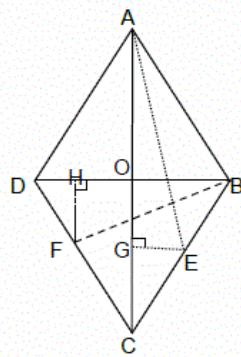
#### Time spent / Accuracy Analysis

Time taken by you to answer this question	101
Avg. time spent on this question by all students	174
Difficulty Level	D
Avg. time spent on this question by students who got this question right	233
% of students who attempted this question	4.09
% of students who got the question right of those who attempted	18.78

[Video Solution](#)

#### Text Solution

Let the lengths of the diagonals AC and BD be  $4a$  and  $4b$  respectively.



Let  $G$  and  $H$  be the foot of the perpendiculars drawn from  $E$  to  $AC$  and from  $F$  to  $DB$  respectively.

Since  $E$  is the midpoint of  $BC$ ,  $GE = \frac{1}{2}OB$  and  $OG = \frac{1}{2}OC$ .

$$\Rightarrow GE = \frac{1}{2}\left(\frac{1}{2}BD\right), OG = \frac{1}{2}\left(\frac{1}{2}AC\right)$$

$$\Rightarrow GE = \left(\frac{1}{2}\right)\left(\frac{1}{2}(4b)\right), OG = \left(\frac{1}{2}\right)\left(\frac{1}{2}(4a)\right)$$

$$\Rightarrow GE = b, OG = a$$

$$AE^2 = AG^2 + GE^2$$

$$\Rightarrow AE^2 = (AD + OG)^2 + GE^2 \\ = (2a + ba)^2 + b^2$$

$$= 9a^2 + b^2 = (\sqrt{83})^2 = 83 \quad \text{_____ (1)}$$

$$\text{Similarly, } BF^2 = a^2 + 9b^2$$

$$= (\sqrt{107})^2 = 107 \quad \text{_____ (2)}$$

Solving, (1) and (2), we get  $a = 2\sqrt{2}$  and  $b = \sqrt{11}$

$$\therefore \text{The area of the rhombus} = \frac{1}{2}(4a)(4b)$$

$$= \frac{1}{2}(4(2\sqrt{2}))(4\sqrt{11}) = 16\sqrt{22} \text{ sq units.}$$

Choice (D)

undefined

**Q17. DIRECTIONS** for questions 16 to 19: Select the correct alternative from the given choices.

If  $a \# b = (a^b)^3$ , the value of  $(7 \# 6) \# 8$  is

a)  $7^{216}$

b)  $7^{648}$

c)  $7^{864}$

d)  $7^{432}$  Your answer is correct

#### Time spent / Accuracy Analysis

Time taken by you to answer this question 18

Avg. time spent on this question by all students 85

Difficulty Level E

Avg. time spent on this question by students who got this question right 83

**Time spent / Accuracy Analysis**

% of students who attempted this question	<b>50.15</b>
% of students who got the question right of those who attempted	<b>94.23</b>

[Video Solution](#)[Text Solution](#)

$$\begin{aligned}a \# b &= (a^b)^3 = a^{3b} \\ \therefore 7 \# 6 &= 7^{18} \\ (7 \# 6) \# 8 &= 7^{18} \# 8 = (7^{18})^{24} = 7^{432}\end{aligned}$$

Choice (D)

undefined

**Q18. DIRECTIONS** for questions 16 to 19: Select the correct alternative from the given choices.If  $2^{x+3} + 3^{y-2} = 145$  and  $2^{2x+1} + 3^{2y-7} = 371$ , where x and y are whole numbers, find the value of  $2^{3x-5} + 3^{y-1}$ .

- a) **259**
- b) **275**
- c) **307**
- d) **283**

You did not answer this question

[Show Correct Answer](#)**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>18</b>
Avg. time spent on this question by all students	<b>178</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>181</b>
% of students who attempted this question	<b>17</b>
% of students who got the question right of those who attempted	<b>87</b>

[Video Solution](#)[Text Solution](#)

$$\begin{aligned}2^{x+3} + 3^{y-2} &= 145, \text{ the left hand side of the equation is the sum of powers of 2 and 3.} \\ \text{Similarly, } 2^{2x+1} + 3^{2y-7} &= 371, \text{ the left hand side of the equation is the sum of powers of 2 and 3.} \\ \text{By inspection, } 145 &= 64 + 81 = 2^6 + 3^4 \\ \Rightarrow x+3 &= 6 \text{ and } y-2 = 4 \\ \Rightarrow x &= 3, y = 6 \\ \text{Also, then } 2^{2x+1} + 3^{2y-7} &= 2^7 + 3^5 = 371 \\ \text{Hence } 2^{3x-5} + 3^{y-1} &= 2^4 + 3^5 = 259.\end{aligned}$$

Choice (A)

undefined

**Q19. DIRECTIONS** for questions 16 to 19: Select the correct alternative from the given choices.

A solid cube, whose edges are 12 cm each, has been cut by a plane such that the plane bisects three edges meeting at a corner. Find the surface area of the remaining part of the cube after the small piece is removed.

- a)

$$810 + 18\sqrt{3} \text{ sq.cm.}$$

b)

$$810 - 24\sqrt{3} \text{ sq.cm.}$$

c)

$$810 - 18\sqrt{3} \text{ sq.cm.}$$

d)

$$810 + 24\sqrt{3} \text{ sq.cm.}$$

You did not answer this question

[Show Correct Answer](#)

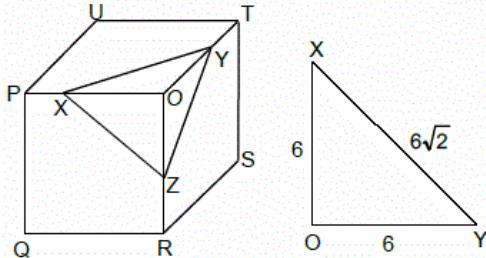
#### Time spent / Accuracy Analysis

Time taken by you to answer this question	15
Avg. time spent on this question by all students	174
Difficulty Level	D
Avg. time spent on this question by students who got this question right	209
% of students who attempted this question	6.64
% of students who got the question right of those who attempted	49.23

[Video Solution](#)

[Text Solution](#)

The given figures show the cube and the pyramid (i.e. the small piece that is removed)



$$\text{Surface area of the cube} = 6(12)^2 = 864$$

The area of the cut portion is the area of the right-angled triangles  $XOZ$ ,  $XOY$  and  $YOZ$ , and the area of the equilateral triangle  $XYZ$  is the newly added area.

$$\text{Area of } XOZ = \text{area of } XOY = \text{area of } YOZ = \frac{1}{2} \times 6 \times 6 = 18$$

$$\text{Area of these triangles} = 3 \times 18 = 54.$$

$$\text{Area of equilateral triangle } XYZ = \frac{\sqrt{3}}{4} \times (6\sqrt{2})^2 = 18\sqrt{3}$$

$$\therefore \text{Area of the remaining portion of the cube's surface} \\ = 864 - 3 \times 18 + 18\sqrt{3} = 810 + 18\sqrt{3}$$

Choice (A)

undefined

**Q20. DIRECTIONS** for question 20: Type in your answer in the input box provided below the question.

If the simple interest on a certain sum for 8 months at 4% p.a. is Rs.129 less than the simple interest on the same sum for 15 months at 5% p.a., the sum (in Rs.) is

Enter your answer as a decimal value, rounded off to two decimal places.

$$810 - 24\sqrt{3} \text{ sq.cm.}$$

$$810 - 18\sqrt{3} \text{ sq.cm.}$$

$$810 + 24\sqrt{3} \text{ sq.cm.}$$

**Your Answer:3600.00 Your answer is correct**

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>26</b>
Avg. time spent on this question by all students	<b>185</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>174</b>
% of students who attempted this question	<b>42.13</b>
% of students who got the question right of those who attempted	<b>51.26</b>

[Video Solution](#)

[Text Solution](#)

$$\frac{P(15/12)5}{100} - \frac{P(8/12)4}{100} = 129$$
$$\frac{P}{1200} (75 - 32) = 129$$
$$P = \frac{129(1200)}{43} = 3,600$$

Ans: (3600)

undefined

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

If  $\log_{10} x - \log_{10} \sqrt[3]{x} = 6 \log_{10} 10$ , then which of the following values can  $x$  assume?

- I. 100
- II.  $\frac{1}{1000}$
- III. 1000
- IV. 10,00,000
- V. 10,000

- a) Only I and II
- b) Only II and III **Your answer is correct**
- c) Only III, IV and V

- d) Only I, III and V

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>39</b>
Avg. time spent on this question by all students	<b>140</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>142</b>
% of students who attempted this question	<b>21.96</b>
% of students who got the question right of those who attempted	<b>79.34</b>

[Video Solution](#)

[Text Solution](#)

$$\begin{aligned} \log_{10} x - \log_{10} \sqrt[3]{x} &= 6 \log_{10} 10 \\ \Rightarrow \log_{10} x - \frac{1}{3} \log_{10} x &= \frac{6}{\log_{10} x} \Rightarrow \frac{2}{3} (\log_{10} x)^2 = 6 \\ \Rightarrow (\log_{10} x)^2 &= 9 \Rightarrow \log_{10} x = \pm 3 \\ \therefore x &= 1000 \text{ or } \frac{1}{1000} \\ \therefore \text{Two values (only II and III) are possible.} \end{aligned}$$

Choice (B)

undefined

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

Working together, two workers complete a job in eight days. Had the first worker worked twice as fast and the second worker at a speed one-third his actual speed, it would have taken them six days to complete the job. In how many days will the second person, working alone, complete the entire job?

- a) **20 days**
- b) **15 days**
- c)  $13\frac{1}{3}$  **days**
- d) **10 days**

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>45</b>
Avg. time spent on this question by all students	<b>162</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>158</b>
% of students who attempted this question	<b>26.08</b>
% of students who got the question right of those who attempted	<b>68.8</b>

[Video Solution](#)

[Text Solution](#)

Given (first person + second person)

$$\text{One day's work} = \frac{1}{8}$$

$$\text{i.e., } F + S = \frac{1}{8} \dots\dots\dots(1)$$

$$2F + \frac{S}{3} = \frac{1}{6} \dots\dots\dots(2)$$

$$2 \times (1) - (2) =$$

$$2S - \frac{S}{3} = \frac{1}{4} - \frac{1}{6}$$

$$\frac{5S}{3} = \frac{2}{24}$$

$$\Rightarrow S = \frac{1}{20}$$

i.e.; the sec

i.e.; the second person alone would take 20 days .

### Choice (A)

undefined

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

Keerthi had to calculate the sum of eight consecutive integers. However, she added one of the numbers twice by mistake and obtained the sum as 1295. Find the number that Keerthi added twice.

**Your Answer:**143 □ **Your answer is incorrect**

Show Correct Answer

## Time spent / Accuracy Analysis

Time taken by you to answer this question	<b>374</b>
Avg. time spent on this question by all students	<b>211</b>
Difficulty Level	<b>M</b>
Avg. time spent on this question by students who got this question right	<b>234</b>
% of students who attempted this question	<b>19.88</b>
% of students who got the question right of those who attempted	<b>29.84</b>

## Video Solution

## Text Solution

Let the 8 numbers be  $a, a + 1, a + 2, \dots, a + 7$ .

Let the number which is added twice be  $a + x$

$$a + a + 1 + a + 2 \dots a + 7 + a + x = 1295$$

$$9a + 28 + x = 1295$$

$$9a = 1267 - x$$

$$a = \frac{1260}{9} + \frac{(7-x)}{9}$$

As  $a$  and  $x$  are integers  $x = 7$  and  $a = 140$ .

The number which is added twice is 147.

Ans: (147)

undefined

**Q24. DIRECTIONS** for question 24: Select the correct alternative from the given choices.

On a table, there are fourteen balls such that exactly four balls lie on a straight line and no other group of three balls lie on a straight line. What is the maximum number of straight lines that can be drawn passing through any two balls on the table?

- a) 88
  - b) 91
  - c) 87

d) 86

You did not answer this question

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	25
Avg. time spent on this question by all students	91
Difficulty Level	M
Avg. time spent on this question by students who got this question right	87
% of students who attempted this question	18.28
% of students who got the question right of those who attempted	67.86

[Video Solution](#)

[Text Solution](#)

There are 14 balls. The number of straight lines that can be drawn =  ${}^{14}C_2 = 91$ .  
 For the four balls, which lie on a straight line, the number of lines decreased by  $({}^4C_2 - 1) = 5$   
 i.e., a net decrease of 5 lines.  
 i.e., there are  $91 - 5 = 86$  possible lines.

Choice (D)

undefined

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

Two persons Ajay and Vijay started working for a company in similar jobs on January 1, 1991. Ajay's initial monthly salary was Rs.400, which increased by Rs.40 after every year. Vijay's initial monthly salary was Rs.500, which increased by Rs.20 after every six months. If these arrangements continue till December 31, 2000, find the total salary (in Rs.) they received during that period.

Your Answer:150000 □ Your answer is incorrect

Show Correct Answer

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	27
Avg. time spent on this question by all students	220
Difficulty Level	M
Avg. time spent on this question by students who got this question right	324
% of students who attempted this question	33
% of students who got the question right of those who attempted	5.36

[Video Solution](#)

[Text Solution](#)

Ajay's salary as on Jan 1<sup>st</sup>, 1991 is ₹400 per month.  
 His increment in his monthly salary is ₹40 per annum.  
 His total salary from Jan 1<sup>st</sup> 1991 to Dec 31<sup>st</sup> of 2000 i.e. in ten years =  $12[2(400) + (10 - 1)40] \times \frac{10}{2} = ₹69,600$

Vijay's Salary as on Jan 1<sup>st</sup> 1991 is ₹500 and his half yearly increment in his monthly salary is ₹20.

∴ His total salary from Jan 1<sup>st</sup> 1991 to Dec 31<sup>st</sup> 2000  
 $= 6[2(500) + (20 - 1)20] \times \frac{20}{2} = ₹82,800$

Total salary of A & B in the ten year period  
 $= ₹69,600 + ₹82,800 = ₹1,52,400$

Ans: (152400)

undefined

**Q26. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

If  $\log_{175} 125 = x$ , what is the value of  $\log_{35} 343$ ?

- a)  $\frac{2(2+3x)}{3+x}$
- b)  $\frac{3(3-2x)}{3-x}$
- c)  $\frac{2(3-2x)}{2+x}$
- d)  $\frac{3(3+2x)}{2+x}$

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	178
Avg. time spent on this question by all students	178
Difficulty Level	M
Avg. time spent on this question by students who got this question right	192
% of students who attempted this question	8.44
% of students who got the question right of those who attempted	74.77

[Video Solution](#)

[Text Solution](#)

$$\begin{aligned}
 \log_{175} 125 &= \frac{3 \log 5}{2 \log 5 + \log 7} \\
 \Rightarrow \frac{3 \log 5}{2 \log 5 + \log 7} &= x \\
 \Rightarrow \log 5 &= \frac{x \log 7}{3 - 2x} \\
 \log_{35} 343 &= \frac{3 \log 7}{\log 5 + \log 7} \\
 \Rightarrow \log_{35} 343 &= \frac{3 \log 7}{\frac{x \log 7}{3 - 2x} + \log 7} \\
 &= \frac{3}{\left(\frac{x}{3 - 2x}\right) + 1} = \frac{3(3 - 2x)}{3 - x}.
 \end{aligned}
 \tag{Choice (B)}$$

undefined

**Q27. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

Manga, Ranga and Banga have some marbles with each of them. Five times the number of marbles with Ranga equals seven times the number of marbles with Manga, while five times the number of marbles with Manga equals seven times the number of marbles with Banga. What is the minimum number of marbles that can be there with all three of them put together?

- a) 113
- b) 109 Your answer is correct
- c) 93
- d) 97

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	90
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**Time spent / Accuracy Analysis**

Avg. time spent on this question by all students	<b>125</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>124</b>
% of students who attempted this question	<b>27.26</b>
% of students who got the question right of those who attempted	<b>92.72</b>

[Video Solution](#)[Text Solution](#)

Let the number of marbles with Manga, Ranga and Banga be m, r and b respectively

Given,  $5r = 7m$  and  $5m = 7b$

$\Rightarrow 25r = 35m$  and  $35m = 49b$

$\Rightarrow 25r = 35m = 49b = k$ (say)

$$\Rightarrow \frac{r}{49} = \frac{m}{35} = \frac{b}{25}$$

The least possible integral values for r, m, b will be r = 49, m = 35 and b = 25.

$\therefore$  Total = 49 + 35 + 25 = 109.

Choice (B)

undefined

**Q28. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

If  $(2015)_6 = (542)_x$ , then x =

- a) 8.
- b) 9. Your answer is correct
- c) 10.
- d) 11.

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>31</b>
Avg. time spent on this question by all students	<b>125</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>130</b>
% of students who attempted this question	<b>17.95</b>
% of students who got the question right of those who attempted	<b>77.71</b>

[Video Solution](#)[Text Solution](#)

$$\begin{aligned}
 (2015)_8 &= (542)_x \\
 2 \times 6^3 + 1 \times 6 + 5 &= 5x^2 + 4x + 2 \\
 5x^2 + 4x + 2 &= 432 + 11 \\
 5x^2 + 4x - 441 &= 0 \\
 x &= \frac{-4 \pm \sqrt{16 + 8820}}{10} \\
 x &= \frac{4 \pm 94}{10} \\
 &= \frac{90}{10} \text{ (or)} \frac{-98}{10}
 \end{aligned}$$

As  $x$  has to be positive  $x = 9$ .

**Alternative Solution:**

As the options are 8, 9, 10, 11 we can convert the number to decimal and then check.

$$(2015)_8 = 2 \times 6^3 + 1 \times 6 + 5 = (443)_{10}$$

As the given number is of form  $(542)_x$

$x$  is 8 or 9.

$$\text{Checking first for } 9, = (542)_9 = 5 \times 81 + 4 \times 9 + 2 = 443$$

$$\therefore x = 9$$

Choice (B)

undefined

**Q29. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

Two friends, Amar and Prem, were born in the month of February of the year 1994. What is the probability that both of them were born on the same day of the week?

- a)  $\frac{3}{28}$
- b)  $\frac{5}{28}$
- c)  $\frac{4}{27}$
- d) **None of the above**

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	76
Avg. time spent on this question by all students	88
Difficulty Level	M
Avg. time spent on this question by students who got this question right	91
% of students who attempted this question	19.04
% of students who got the question right of those who attempted	61.62

[Video Solution](#)

[Text Solution](#)

The total number of ways in which Amar and Prem could have their birthdays =  $(28)(28) = 784$ .

The month of February has four Mondays, four Tuesdays, four Wednesdays, four Thursdays, four Fridays, four Saturdays and four Sundays.

The no. of days on which Amar can have his birthday is 28.

The no. of days on which Prem can have his birthdays such that both of them are born on the same day of the week is 4.

$$\therefore \text{The required probability } \frac{(28)(4)}{(28)(28)} = \frac{1}{7}$$

**Alternative Solution:**

The month of February has each day of the week occurring exactly four times.

Let Amar be born on a certain day of the week (irrespective of the exact day of the month)

i.e., Let Amar be born on, say a Wednesday.

Now, Prem must have been born, on any of the four Wednesday's in that month, out of all the 28 days possible. Hence, required probability =  $\frac{4}{28} = \frac{1}{7}$ .      Choice (D)

undefined

**Q30. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

Three athletes, Samrat, Sarath and Sridhar, run a race. Sarath finished 24 meters ahead of Sridhar and 36 meters ahead of Samrat, while Sridhar finished 16 meters ahead of Samrat. If each athlete runs the entire distance at their respective constant speeds, what is length of the race?

- a) 108 m
- b) 90 m
- c) 80 m
- d) 96 m

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	193
Avg. time spent on this question by all students	173
Difficulty Level	M
Avg. time spent on this question by students who got this question right	183
% of students who attempted this question	16.05
% of students who got the question right of those who attempted	71.58

[Video Solution](#)

[Text Solution](#)

Let the length of the race be 'x' meters. When Sarath finished the race, Samrat and Sridhar would have run  $(x - 36)$  and  $(x - 24)$  meters respectively. When Sridhar finishes the race, Samrat would have run  $(x - 16)$  meters

∴ The ratio of speeds of Sridhar and Samrat would be

$$\frac{x-24}{x-36} = \frac{x}{x-16}$$

$$(x-24)(x-16) = x(x-36)$$

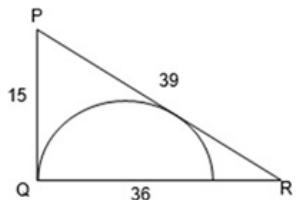
$$x^2 - 40x + 384 = x^2 - 36x$$

$$4x = 384 \Rightarrow x = 96 \text{ m}$$

Choice (D)

undefined

**Q31. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.



Find the radius of the semicircle inscribed in the above triangle with sides 15 cm, 36 cm and 39 cm.

- a) 12 cm
- b) 10 cm
- c) 11.5 cm
- d) 10.5 cm

You did not answer this question

Show Correct Answer

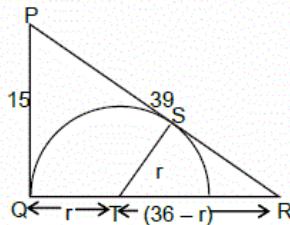
**Time spent / Accuracy Analysis**

Time taken by you to answer this question	5
Avg. time spent on this question by all students	142
Difficulty Level	M
Avg. time spent on this question by students who got this question right	159
% of students who attempted this question	11.79
% of students who got the question right of those who attempted	40.51

[Video Solution](#)

[Text Solution](#)

It can be observed that  $\triangle PQR$  is right angled at Q, since  $15^2 + 36^2 = 39^2$



Let S be the point of tangency of the semi-circle with PR and let T be the center of the semi-circle.

Since QT is radius and  $PQ \perp QT$  (or  $QR$ ), PQ must be a tangent. The lengths of two tangents drawn to a circle from a point are equal.

$$\therefore PS = PQ = 15 \Rightarrow SR = 39 - 15 = 24$$

$$\text{If the radius is taken to be } 'r', \text{ then } RT^2 = SR^2 + ST^2 \\ \Rightarrow (36 - r)^2 = 24^2 + r^2 \Rightarrow r = 10 \text{ cm.}$$

#### Alternative Solution 1:

$$\begin{aligned} \text{From the figure, area of } \triangle PQR &= \frac{1}{2} \cdot 15 \cdot 36 \\ &= \Delta PQT + \Delta PRT \\ &= \left( \frac{1}{2} \times 15 \times r \right) + \left( \frac{1}{2} \times 39 \times r \right) \\ &\Rightarrow 15 \cdot 36 = 15 \cdot r + 39 \cdot r \\ &\Rightarrow r = \frac{15 \cdot 36}{(15 + 39)} = 10 \end{aligned}$$

#### Alternative Solution 2:

In the figure,  $\triangle PQR$  and  $\triangle TSR$  are similar.

$$\text{Hence, } \frac{15}{39} = \frac{r}{36 - r} \Rightarrow r = 10.$$

Choice (B)

undefined

**Q32. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

The absolute difference between a three-digit natural number and the number obtained by reversing its digits is 594. How many such natural numbers are possible?

- a) 40
- b) 60
- c) 63
- d) 70

You did not answer this question

Show Correct Answer

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	13
Avg. time spent on this question by all students	134
Difficulty Level	M
Avg. time spent on this question by students who got this question right	138
% of students who attempted this question	15.35
% of students who got the question right of those who attempted	14.95

[Video Solution](#)

### Text Solution

Let the three digit number be abc  
Given  
 $abc - cba = 594$   
 $100a + 10b + c - 100c - 10b - a = 594$   
 $99a - 99c = 594$   
 $a - c = 6$   
b can take values from 0 to 9  
i.e., 10 values  
as the difference in absolute values of (a, c) can be (9,3), (8,2), (7,1) (6,0) (3,9), (2,8),  
(1, 7)  
total numbers  $7 \times 10 = 70$  numbers

Choice (D)

undefined

**Q33. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

If  $a^{\log b} = 5^{\log 3}$ , then the ordered pair (a, b) can assume which of the following values?

- I. (5, 3)
- II. (3, 5)
- III.  $(5^3, 3^5)$
- IV.  $(3^5, 5^3)$

- a) Only I and II
- b) Only I and IV
- c) Only III and IV
- d) Only II and III

You did not answer this question

[Show Correct Answer](#)

#### Time spent / Accuracy Analysis

Time taken by you to answer this question	35
Avg. time spent on this question by all students	90
Difficulty Level	E
Avg. time spent on this question by students who got this question right	90
% of students who attempted this question	17.04
% of students who got the question right of those who attempted	45.89

### Video Solution

### Text Solution

$a^{\log b} = b^{\log a}$ .  
Thus (a, b) can assume the values (5, 3) or (3, 5).

Choice (A)

undefined

**Q34. DIRECTIONS** for questions 26 to 34: Select the correct alternative from the given choices.

Which of the following is the quadratic equation whose roots are the reciprocals of the roots of  $py^2 + qy + r = 0$ ?

- a)  $qy^2 + ry + p = 0$
- b)  $ry^2 + py + q = 0$
- c)  $ry^2 + qy + p = 0$
- d) **None of the above**

You did not answer this question

[Show Correct Answer](#)

**Time spent / Accuracy Analysis**

Time taken by you to answer this question	<b>15</b>
Avg. time spent on this question by all students	<b>77</b>
Difficulty Level	<b>E</b>
Avg. time spent on this question by students who got this question right	<b>67</b>
% of students who attempted this question	<b>23.7</b>
% of students who got the question right of those who attempted	<b>78.23</b>

[Video Solution](#)

**Text Solution**

Let the roots of  $py^2 + qy + r = 0$  be  $\alpha$  and  $\beta$ .

We require the quadratic equation whose roots are  $\frac{1}{\alpha}$  and  $\frac{1}{\beta}$ .

By replacing  $y$  in  $py^2 + qy + r = 0$  by  $\frac{1}{y}$ , we will obtain the required equation.

Required equation is  $p\left(\frac{1}{y}\right)^2 + q\left(\frac{1}{y}\right) + r = 0$

i.e.  $ry^2 + qy + p = 0$ .

Choice (C)