

T.I.M.E.Triumphant Institute of
Management Education Pvt. Ltd.**(Key and Solutions for AIMCAT1817)****Key****SECTION – I**

1. B	8. C	15. B	22. A	29. 3
2. A	9. D	16. C	23. D	30. 4
3. C	10. B	17. D	24. C	31. 1
4. D	11. D	18. C	25. 25143	32. 2
5. C	12. C	19. C	26. 42153	33. 22211
6. B	13. A	20. B	27. 35421	34. 21212
7. B	14. B	21. 1235	28. 51324	

SECTION – II

1. C	8. 9	15. C	22. B	29. B
2. D	9. A	16. A	23. C	30. 3
3. B	10. C	17. A	24. A	31. D
4. D	11. D	18. B	25. B	32. C
5. C	12. B	19. D	26. 5	
6. A	13. 57	20. 4800	27. D	
7. A	14. 42	21. D	28. A	

SECTION – III

1. C	8. A	15. C	22. B	29. B
2. D	9. A	16. B	23. D	30. D
3. D	10. 18	17. B	24. 4	31. C
4. C	11. C	18. C	25. B	32. D
5. B	12. B	19. B	26. C	33. B
6. B	13. 10	20. C	27. 4083	34. 2
7. 995	14. A	21. B	28. 4	

Solutions**SECTION – I****Solutions for questions 1 to 6:****Number of words and Explanatory notes for RC:**

Number of words: 707

1. In the fifth paragraph of the passage, the author states, "research into artificial intelligence (AI) has delivered in many areas of life". But we have failed to build an effective Artificial General Intelligence.

Option A: The author mentions that research in AI has delivered in many areas. So we cannot say we have not been able to understand Artificial Intelligence completely. Further, the author does not mention that understanding AI is necessary for building an efficient Artificial General Intelligence.

Option B: According to the author, "we have never actually worked out what natural intelligence is, so we don't know what it is that we are trying to imitate in our machines". In order to understand what natural intelligence is, the author went back "to the source of human intelligence - the human brain and tried to see how we might use computers to better understand this mysterious organ". We can infer from

this that according to the author, the reason why we were not able to build an effective Artificial General Intelligence is that we do not understand natural intelligence. To understand natural intelligence, the author studied the human brain.

So, let's see what we have:

Statement – We don't understand natural intelligence

Reason – The brain is the source of natural intelligence, and we haven't understood how that source works.

Step considered – So let's try to understand the working of the brain first.

Therefore –

(i) Until we understand the working of the brain, we won't understand natural intelligence.

(ii) Our primary lack, in the creation of Artificial General Intelligence, is an understanding of how the brain works.

So choice B is the reason that we were not able to build effective Artificial General Intelligence.

Option C: The passage does not talk about the Turing test when it talks about the failure to deliver Artificial General Intelligence. Hence this is not the correct answer.

Option D: The author mentions what the Turing test is in the second paragraph of the passage. Hence, this is not the correct answer.

- Therefore, the correct answer is option B.
Choice (B)
2. The author talks about the SpiNNaker machine in the seventh paragraph of the passage. According to the author, it is "a machine designed specifically to support computer models of systems that work in some ways that are similar to the brain".
 Statement I: According to the author, the SpiNNaker machine "can be used to model areas of the brain". Hence, this is one of the functions of the SpiNNaker machine.
 Statement II: The author mentions in the last two paragraphs the advantages of building computer models of the brain. One of these advantages is understanding various brain diseases. However, this is not directly related to SpiNNaker machine. This is a part of the Human Genome Project, "in which SpiNNaker is playing its role". Therefore, this is not a function of the SpiNNaker machine.
 Statement III: This is another advantage of building computer models of the brain and is not a function of the SpiNNaker machine.
 Therefore, only I is a function of the SpiNNaker machine.
Choice (A)
3. The passage talks about Alan Turing and his 'Imitation Game' at the beginning of the passage. Turing thought that all that a machine would require to pass his test was more memory - the 1948 Manchester 'Baby' was quite powerful enough already. He estimated that a gigabyte (a thousand million bytes) of memory should suffice, and this should be achievable by the end of the twentieth century.
 By the beginning of the 21st century computers did, indeed, typically have a gigabyte of memory, and they were a million times faster than the 'Baby', but still they could not pass his test. Even today, with still far more computing power and memory, no machine has convincingly passed the test. This would have surprised Turing had he lived to see it.
 Option A: According to Turing, "a gigabyte (a thousand million bytes) of memory should suffice" for computers to pass his test. He also predicted that "this should be achievable by the end of the twentieth century". In the next paragraph, the author mentions that "By the beginning of the 21st century computers did, indeed, typically have a gigabyte of memory". Hence, this is not a mistake on the part of Turing.
 Option B: The passage does not mention Turing talking about us understanding how our brain functions. Hence, this is not the correct answer. (Even the following - "Can machines think?" He then went on to suggest that this question is difficult to answer directly, and he turned it around into a research experiment that he called 'The Imitation Game', but which subsequent generations simply know as the Turing test for Artificial Intelligence. - is not enough to support choice B.)
 Option C: According to Turing, "all that a machine would require to pass his test was more memory". Even though computers with more memory was available by the twentieth century, the machines were not able to pass the Turing test. Hence, his assumption that large amount of memory will be sufficient for a machine to pass his test is not correct. Choice C is the answer.
 Option D: Turing did not talk about Artificial Intelligence as such. He only wondered whether machines will be able to think and devised the Turing test. Hence, this is not the correct answer.
 Therefore, the correct answer is option C. Choice (C)
4. The second paragraph of the passage describes the Turing test. A computer is said to have passed the test when **most people** sitting at the terminal cannot identify the computer correctly **most of the time**.
 Option A: One out of the ten persons could not identify the human from the computer. But the other nine were able to identify correctly. Hence, we cannot say that most of the persons were not able to identify the computer. Therefore, in this case, the computer could not have passed the Turing test.
- Option B: All the ten persons identified correctly half the time and incorrectly half the time. In this case, we cannot say that they were not able to identify correctly "most of the time". Hence, the computer could not have passed the Turing test.
 Option C: If all the ten persons were able to correctly identify the computer, then it could not have passed the Turing test.
 Option D: In this case, one person identified correctly most of the time. The other nine could not identify correctly even once. Hence, we can say that most of them (i.e., nine out of ten persons) could not identify correctly most of the time (i.e., all the time). Hence, in this case, the computer can be said to have passed the Turing test. Hence, only in the situation given in option D, the computer is said to have passed the Turing test.
Choice (D)
5. The passage talks about Artificial Intelligence and Artificial General Intelligence in the fifth paragraph.
 Option A: The passage mentions that by the 21st century, computers "were a million times faster than the 'Baby'". The passage also states that these computers were not able to pass the Turing test. Hence, being fast is not what differentiates AI from Artificial General Intelligence.
 Option B: The passage does not mention that because of AI we are able to "talk into our smartphones". Hence, recognizing the meaning of words is not the differentiating factor.
 Option C: Artificial General Intelligence is "the idea that a suitably programmed machine might display aspects of intelligence that we normally associate only with humans". Hence, this is the feature that will be in Artificial General Intelligence but not in AI.
 Option D: The passage does not mention about the emotional state of a person and understanding it.
 Hence, the correct answer is option C. Choice (C)
6. According to the passage, "the world's first operational electronic stored-program computer ran its first program in Manchester, on June 21, 1948". This was referred to as the Manchester Baby.
 Option A: The passage states that "the 1948 Manchester 'Baby' was quite powerful enough already". While we can infer from the passage that it was the first of its kind, we cannot infer that it was the most powerful computer. Hence, this is not the correct answer.
 Option B: According to Turing, "a gigabyte (a thousand million bytes) of memory should suffice" to pass his test. He also felt that "all that a machine would require to pass his test was more memory - the 1948 Manchester 'Baby' was quite powerful enough already". From this we can infer that the Manchester 'Baby' did not have a gigabyte of memory. If it had, Turing would not have the need to predict that computers with a gigabyte of memory would have passed his test. Hence, this is the correct answer.
 Option C: Turing wrote his paper on 'Imitation Game' in Manchester and "it was this machine that brought Turing to Manchester". However, the passage does not explicitly mention whether Turing performed his test on the Manchester 'Baby'. Hence, this cannot be inferred from the passage.
 Option D: The passage states that the machines in the 21st century "were a million times faster than the 'Baby'". But it does not mention that the Manchester 'Baby' had a better chance of passing the test.
 Therefore, the correct answer is option B. Choice (B)

Solutions for questions 7 to 9:

Number of words and Explanatory notes for RC:

Number of words: 430

7. There are three main approaches to de-extinction scientists talk about. The first is called backbreeding. A second option is cloning. The newest option is genetic engineering. Hence choice B is the answer. The passage does not discuss the rationale behind bringing or not bringing the

extinct species back from the dead. So choice A is not the answer. Even though the mammoth and the passenger pigeon have been mentioned in the passage, choice C is not the answer. Choice D does not form a part of the discussion.

Choice (B)

8. Option A: Backbreeding, involves finding living species that have traits similar to the extinct species. Then scientists would selectively breed these animals to try to make a version that more closely resembles the extinct animal. The genetic engineering approach doesn't produce genetically identical copies of extinct animals, but rather modern versions of an animal engineered to look and behave like its extinct relatives. Hence choice A is true and is not the answer.

Option B: Cloning may eventually give us basically identical genetic copies of extinct species, but we'll be restricted to animals that went extinct more recently and have well-preserved cells with intact nuclei. The mammoth and the passenger pigeon may never be cloned. Hence choice B is true and is not the answer.

Option C: The passage indicates that backbreeding isn't really a true de-extinction. Cloning may eventually give us basically identical genetic copies of extinct species. The first part of choice C is true from para 3 but the second part is not correct. Hence choice C is false and is the answer.

Option D: The genetic engineering technology is being used by the mammoth and passenger pigeon groups. Backbreeding is a process already underway for some extinct species like aurochs. So choice D is correct and is not the answer.

Choice (C)

9. Earth is in the midst of its sixth mass extinction: Somewhere between 30 and 150 species disappear every day, thanks largely to humans, and more than 300 types of mammals, birds, reptiles, and amphibians have vanished since 1500. These rates do not bode well for the future of life on our planet. What if we could resurrect some of the species we've lost? Redemption means atoning for one's sins. Redemption does not apply to animals or to the world in general. So choice D is the answer.

Option A: Choice A does not explain the "resurrection-redemption" link. Hence it is not the answer.

Option B: The passage does not discuss the context of 'conservation'. Hence choice B does not apply.

Option C: Choice C does not answer the question. In cloning, scientists would take a preserved cell from a recently extinct animal (ideally before the last of its kind died) and extract the nucleus. They would then swap this nucleus into an egg cell from the animal's closest living relative and implant the egg into a surrogate host. In genetic engineering, researchers would line up the genome of an extinct animal with that of its closest living relative. They would then use CRISPR and other gene-editing tools to swap relevant genes from the extinct animal into the living species and implant the hybrid genome into a surrogate (or grow it in an artificial womb).

Choice (D)

Solutions for questions 10 to 15:

Number of words and Explanatory notes for RC:

Number of words: 615

10. The author mentions that New York Times published "some of the details of the Manchester atrocity". This was called "unacceptable" and consequently, they British police stopped sharing information with their American counterparts.

Option A: In the first paragraph of the passage, the author states that "telling the public concrete and inconvenient facts is almost treasonous". Further, in the third paragraph of the passage, the author mentions that "It is hard to see how the detailed information leaked to the New York Times hinders any investigation". Hence, the information published by them could not have hindered any investigation.

Option B: The primary reason why the British police have stopped sharing information is because New York Times published information regarding the Manchester bombings. Hence, this is the correct answer.

Option C: The passage does mention that "the president's own recklessness with secrets may underlie some of the present disquiet among security professionals". However, we cannot call this the primary reason.

Option D: In the second paragraph of the passage, the author mentions that "There are reasonable grounds for anger at the first leak, to an American news network, of the bomber's name". However, he does not mention that New York Times published this information. Hence, this is not the correct answer.

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

11. In the second paragraph, the author talks about certain information, when published, will hinder the police investigation.

Option A: When talking about how to define operational secrecy, the author provides the example of British media publishing stories about the CIA. However, we cannot infer from the passage whether the author is against this. So choice A is not the answer.

Option B: In the third paragraph, the author mentions that "There is a line beyond which crime photographs turn into a kind of exhibition of violence". However, he also says that "the pictures so far published do not approach that line". Hence, we can say that the author would most probably not be against this. So choice B is not the answer.

Option C: In the third paragraph, the author asks "Will Islamic State be strengthened by knowing the brand of rucksack that the bomber used?". We can infer that the author believes that publishing this kind of information will not hinder any investigation. Hence, the author will not be against this. Choice C is not the answer.

Option D: The author provides reasons in the second paragraph why publishing the name of the bomber will hinder the investigation. He mentions that "There are reasonable grounds for anger at the first leak". Hence, the author would most probably not support the publication of the bomber's name.

Hence, the correct answer is option D. Choice (D)

12. We can infer from the passage that the information leaked by the New York Times caused outrage "in the security establishment, and among politicians" in Britain. However, the author does not think that it deserves such outrage.

Option A: In the third paragraph, the author talks about how "crime photographs turn into a kind of exhibition of violence and increase the misery of grieving relatives". However, he mentions that "the pictures so far published do not approach that line". Further, this discussion is not confined only to the material published by New York Times as he also talks about the London bombings in the paragraph. Hence, this is not the correct answer.

Option B: In the fourth paragraph, the author talks about two types of information - 'intelligence material' and 'routine police databases'. Further, the author mentions that "nothing in the New York Times which has so far been published reveals secret intelligence sources or even hints at their existence". Hence we can infer that the information that the New York Times obtained regarding the Manchester bombings was a part of the routine police databases. Hence, this is not the correct answer.

Option C: From the explanation given for the above option, we can infer that the information published in the New York Times was from the routine police database to which tens of thousands of people have access. Hence, this is the correct answer.

Option D: The passage mentions that President Trump announced that "he wants the leakers caught and punished". However, there is no mention in the passage about President Trump backing the publication of information in New York Times.

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

13. The author talks about when newspapers need to be discreet and when they should publish leaked information.
 Option A: In the last paragraph of the passage, the author says that "These are questions calling for calm deliberation, not angry demands for new powers to monitor the internet". We can infer from this that the author does not want the investigation to be sidestepped into a debate about internet monitoring. Hence, this is the correct answer.
 Option B: The author mentions that "Operational secrecy is sometimes necessary, and no responsible media organisation will hinder it". Hence, he would most probably not support the view that newspapers should publish any information that they come across.
 Option C: In the last paragraph, the author mentions that "This newspaper is on the side of greater openness". We can infer from this that the author does not support the government monitoring publication of stories in newspapers.
 Option D: In the third paragraph, the author mentions that "There is a line beyond which crime photographs turn into a kind of exhibition of violence". But that implies that such photographs could be okay up to a point. Hence, this is not the correct answer.
 Therefore, the correct answer is option A.

Choice (A)

14. The author talks about a responsible media organisation in the second paragraph of the passage.
 Option A: The author mentions that "no responsible media organisation will hinder" operational secrecy. In the fourth paragraph, he talks about the intelligence agencies. However, he does not mention that information with intelligence agencies should not be published. Hence, this is not the correct answer.
 Option B: In the second paragraph, the author mentions that "no responsible media organisation will hinder" operational secrecy. However, "the judgment of what constitutes operational secrecy will always be contested". From this we can infer that the author believes that a responsible media organisation should recognise the importance of maintaining secrecy when required. Hence, this is the correct answer.
 Option C: This statement is in direct violation to what the author mentioned. Hence, this is not the correct answer.
 Option D: This statement is too extreme and nowhere in the passage does the author mention that newspapers should not publish any information related to any ongoing investigation. Hence, this is not the correct answer.
 Therefore, the correct answer is option B. Choice (B)

15. In the last paragraph, the author mentions that "there are real questions to be answered about what was known about the bomber and when and by whom".
 Option A: The questions that the author asked cannot help in identifying the whereabouts of the bomber. The questions are of a retrospective nature. Therefore, this is not the correct answer.
 Option B: The questions that the author asked help in identifying why the security services were not able to stop the bombings from happening in the first place. Hence, this is the correct answer.
 Option C: The author does not ask anything about why they happened. In the questions that he asks, he does not seek the reasons why the bombings happened. Hence, this is not the correct answer.
 Option D: The questions that the author asks are not related to the role of newspapers. Hence, this is not the correct answer.
 Therefore, the correct answer is option B. Choice (B)

Solutions for questions 16 to 18:

Number of words and Explanatory notes for RC:

Number of words: 454

16. Option A: Choice A ("did not want to work on the farms") has not been explicitly mentioned in the passage as the reason. We only know that the factory wage in the north

was typically three times more than what blacks could expect to make by working the land in the rural South.
 Option B: Industrialized urban areas in the North, Midwest and West faced a shortage of industrial laborers, as the war put an end to the steady tide of European immigration to the United States. While choice A is true, it is not the primary or the only reason for the Great Migration to take place.
 Option C: Driven from their homes by unsatisfactory economic opportunities and harsh segregationist laws, many blacks headed north, where they took advantage of the need for industrial workers that first arose during the First World War. White supremacy was largely restored across the South, and the segregationist policies known as Jim Crow soon became the law of the land. ... Hence choice C is the answer.
 Option D: Choice D is incorrect. There is no mention of gender and racial equality in the passage. While segregation was not legalized in the North (as it was in the South), racism and prejudice were widespread in the North.
 Choice (C)

17. Option A: The Great Migration, or the relocation of more than 6 million African Americans from the rural South to the cities of the North, Midwest and West from 1916 to 1970, had a huge impact on urban life in the United States. So 'more than fifty years' is correct in choice A. But we cannot say that Jim Crow started the Great Migration. This makes choice A incorrect.
 Option B: There is not enough in the passage to infer "success of industrialization" or "era of political activism". The passage only discusses the growth of a new urban African-American culture and mentions an artistic movement (New Negro Movement) in the last para. So choice B is incorrect.
 Option C: There is no mention of 'equality of blacks' in the passage. While segregation was not legalized in the North (as it was in the South), racism and prejudice were widespread. So choice C is incorrect.
 Option D: In the decade between 1910 and 1920, the black population of major Northern cities including New York, Chicago, Philadelphia and Detroit grew by large percentages. Working conditions were arduous and sometimes dangerous. Female migrants had a harder time finding work, spurring heated competition for domestic labor positions. Aside from competition for employment, there was also competition for living space in the increasingly crowded cities. While segregation was not legalized in the North (as it was in the South), racism and prejudice were widespread. Hence choice D is the answer.
 Choice (D)

18. Option A: Segregation was not legalized in the North (as it was in the South). So choice A is incorrect and in any case 'segregation' was not a factor for the blacks finding it difficult to find accommodation.
 Option B: Choice B is besides the point.
 Option C: After the U.S. Supreme Court declared racially based housing ordinances unconstitutional in 1917, some residential neighborhoods enacted covenants requiring white property owners to agree not to sell to blacks; these would remain legal until the Court struck them down in 1948. Hence choice C is the correct answer.
 Option D: Segregation was not legalized in the North (as it was in the South). The Ku Klux Klan continued underground even after its official dissolution in 1869, and intimidation, violence and lynching of black southerners were common in the Jim Crow South. The passage does not talk about the resurgence of the activities of the Ku Klux Klan in the north. So choice D is not the answer.
 Choice (C)

Solutions for questions 19 to 24:

Number of words and Explanatory notes for RC:

Number of words: 769

19. Option A: The emission of greenhouse gases into the atmosphere is changing the marine environment along with

the rest of the planet. The ocean has warmed by 0.7°C since the 19th century, damaging corals and encouraging organisms to migrate towards the poles in search of cooler waters. Greater concentrations of carbon dioxide in the water are making it more acidic. But the first part of choice A cannot be ascertained from the passage. Hence choice A is not the answer.

Option B: The Paris agreement is the single best hope we have as of now for protecting the ocean and its resources. But America is not strongly committed to the deal; it may even pull out. However, the limits agreed on in Paris will not prevent sea levels from rising and corals from bleaching. Indeed, unless they are drastically strengthened, both problems risk getting much worse. Hence choice B (is the only hope we have ever had) is not fully correct and is not the answer.

Option C: Clearer information may also help align incentives and allow private capital to reward good behaviour. Insurance firms, for instance, have an incentive to ask for more data on fishing vessels; if ships switch off their tracking systems, the chances of collisions rise, and so do premiums. So choice C is correct.

Option D: Commercial pay-offs from giving fish stocks time to recover, for example, are large and well-documented; but the rewards that accrue from removing plastic from the high seas are unclear. So the converse of choice D is true. Choice D is not the answer.

Choice (C)

20. Refer to the last paragraph. Better measurement of global warming's effect on the ocean does not make a solution any easier. The limits agreed on in Paris will not prevent sea levels from rising and corals from bleaching. Both problems risk getting much worse. From this, we can infer that the author's tone is pessimistic. Hence choice B is the answer.

Option A: Passionate refers to having, showing, or caused by strong feelings or beliefs; intense; ardent; excitable. Choice A is not the answer.

Option C: Disparaging means tending to belittle or bring reproach upon; expressing the opinion that something is of little worth; derogatory. Choice C is not the author's tone in the last para.

Option D: Stoical means unemotional, enduring pain and hardship without showing one's feelings or complaining, imperturbable. Choice D is not the author's tone in the last para.

Choice (B)

21. "Ocean blindness" can be cured by access to information. Improvements in computing power, satellite imaging and drones are bringing the ocean into better view than ever before. Work is under way to map the sea floor in detail using sonar technology. On the surface, aquatic drones can get to remote, stormy places at a far smaller cost than manned vessels. Ocean-colour radiometry is improving understanding of how phytoplankton move and thrive. Tiny satellites, weighing 1-10kg, are enhancing scrutiny of fishing vessels: craft that switch off their tracking devices when they approach a marine protected area excite suspicion. As sea-floor soundings proliferate, the supervision of deep-sea mining should get better. So (1), (2), (3) and (5) can serve to cure the "ocean blindness" that has been mentioned in the passage.

By the middle of the century the ocean could contain more plastic than fish by weight. Commercial pay-offs from giving fish stocks time to recover, for example, are large and well-documented; but the rewards that accrue from removing plastic from the high seas are unclear. But (4) may not be feasible and is not directly related to "ocean blindness" or to "access to clearer information" as discussed in the passage. (4) is not an answer to the question.

Ans: (1235)

22. In the passage, the author mentions various problems afflicting the oceans. He then discusses some methods of dealing with those problems.

The author has a pessimistic tone in the last para of the passage. This is also evident in the second half of the penultimate paragraph. {But superior information does not

solve the fundamental problem of enforcing property rights for the high seas the rewards that accrue from removing plastic from the high seas are unclear.} Choice A is the best sentence that can conclude the last para. It continues with the 'skeptical' tone of the passage as evident in "Whether it can stop it is another question." Also, "Mankind is increasingly able to see the damage it is doing to the ocean." follows from "Clearer information", "Greater traceability" and "more attention to the state of the marine realm" discussed in the passage. Hence choice A is the answer to the question.

Choice B does not capture the skeptical tone of the author. It focusses more on the problem rather than the solution and can come earlier in the flow and not at the end of the passage.

Choice C can serve as an ending to the first paragraph of the passage. "too big" in choice C follows from "The ocean covers almost three-quarters of the planet"

Choice D can serve as an ending to the fourth paragraph of the passage where there is a mention of "waters outside national jurisdictions" and "without defined property rights, the interests of individual actors in exploiting such areas win out over the collective interest in husbanding them." Choices B, C and D do not conclude the last paragraph of the passage.

Choice (A)

23. Option A: The emission of greenhouse gases into the atmosphere is changing the marine environment along with the rest of the planet. The ocean has warmed by 0.7°C since the 19th century, damaging corals and encouraging organisms to migrate towards the poles in search of cooler waters. Greater concentrations of carbon dioxide in the water are making it more acidic. Hence choice A is a factor. Option B: The ocean nurtures humanity. Humanity treats it with contempt. Waters outside national jurisdictions – the high seas – are a global commons. Without defined property rights or a community invested in their upkeep, the interests of individual actors in exploiting such areas win out over the collective interest in husbanding them. So choice B is also a reason.
- Option C: The bulk of the ocean is beyond the horizon and below the waterline. The damage being done to its health is visible in a few liminal places but for the most part, the sea is out of sight and out of mind. Therefore choice C is also an answer.

Choice (D)

24. Refer to the first three sentences of the passage.
- Option C: Earth is poorly named. The ocean covers almost three-quarters of the planet. It is divided into five basins: the Pacific, the Atlantic, the Indian, the Arctic and the Southern oceans. Were all the planet's water placed over the United States, it would form a column of liquid 132 km tall. This makes choice C the correct answer.
- Option A: Policymakers are paying more attention to the state of the marine realm. But choice A is extreme in tone and is not the answer.
- Option B: Choice B has not been explicitly mentioned in the passage. It does not answer the question.
- Option D: The ocean nurtures humanity. The ocean provides 3bn people with almost a fifth of their protein (making fish a bigger source of the stuff than beef). Fishing and aquaculture assure the livelihoods of one in ten of the world's people. From this, we cannot infer that the oceans are the largest source of nutrition for man. Hence choice D is not the answer.

Choice (C)

Solutions for questions 25 to 28:

25. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the para. It mentions the topic of discussion: Therapeutic hypothermia. Sentence 2 is followed by sentence 5. "Therapeutic hypothermia surgical practice" in sentence 2 links with "Experimental procedures cooling cardiac and neonatal cases" in sentence 5. Sentences 5 and 1 form a mandatory pair. "cooling mostly in cardiac and neonatal cases" in sentence 5 links with "Babies cooling blankets or packed in ice and even snow banks to slow circulation before heart surgery"

in sentence 1. Sentence 1 which talks about the procedure in the past is followed by sentence 4 which talks about the situation today. "babies ice and even snow banks to slow circulation and reduce oxygen requirements before heart surgery" in sentence 1 parallels "care for some newborns in medical distress, such as those born premature or suffering from fetal oxygen deprivation (hypoxia)" in sentence 4. Sentence 4 is followed by sentence 3. "fetal oxygen deprivation (hypoxia)" in sentence 4 is followed by "reduce tissue oxygen requirements" in sentence 3. So, 25143. It can be noticed that sentences 5 and 1 have been given in the past tense and sentences 4 and 3 in the present tense. Also, "as early as the 1960s, mostly in cardiac and neonatal cases" as given in sentence 5 contrasts "those born premature or suffering from fetal oxygen deprivation (hypoxia)" as given in sentence 4. Sentences 1 and 3 are similar in content. "Babies were placed in cooling blankets or packed in ice" in sentence 1 parallels "The babies are treated with cooling caps for 72 hours" in sentence 3.

Ans: (25143)

26. On a careful reading of the sentences, it can be observed that sentence 1 (combination of vastness and vulnerability) can be placed only after sentences 4 and 2. Sentence 4 is a general sentence that begins the para. It introduces the topic of discussion: China's growing global clout can be unsettling. Sentences 4 and 2 form a mandatory pair. "At the same time, China's recent financial tumult has been unnerving" in sentence 2 can only come after "China's growing global clout can be unsettling" in sentence 4. Sentence 1 (This combination of **vastness** and **vulnerability**) follows sentence 4 (**growing global clout**) and sentence 2 (China's recent financial tumult). Sentence 1 is followed by sentence 5. "Both groups" in sentence 5 links with "some people afraid of China and others afraid for it" in sentence 1. Sentences 5 and 3 form another mandatory pair. "Asia Infrastructure Investment Bank (AIIB) approved its first **\$509m-worth** of projects" in sentence 5 links with "The AIIB reflects China's new eagerness to institutionalise its **official lending abroad**" in sentence 3. So, 42153.

Ans: (42153)

27. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the paragraph. It introduces the background: Apple **revolutionized** *online music* with the *iPod* and *iTunes*. Sentence 3 is followed by sentence 5 which highlights another transformation done by Apple: about to **transform** the **payments business** through ApplePay. Sentence 5 is followed by sentence 4: next set of businesses to have their **applecarts overturned** may be the *mobile-telecoms operators*. So sentences 3, 5 and 4 in that order talk about some changes done by Apple. Sentences 4 and 2 are linked. "new type of SIM card that lets users switch easily between operators without replacing the card" in sentence 2 points to "mobile-telecoms operators" in sentence 4. So, 3542. Sentence 1 (seriously weaken the operators' grip on their market) follows as a consequence of the point mentioned in sentence 2 (users switch easily between operators without replacing the card). Hence 35421.

Ans: (35421)

28. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It mentions an annoyance that a researcher experiences in the area of scientific publishing: slowness. Sentences 5 and 1 form a mandatory pair. "slowness in **scientific publishing** will come near the top of the list of gripes" in sentence 5 links with "It takes nearly six months wend its way from submission to **publication**" in sentence 1. Sentence 3 follows sentence 1 as it adds to the list of gripes or annoyance that a researcher experiences in the field of scientific publishing. "Worse, a paper is often rejected by one or more others" in sentence 3 follows "It takes nearly six months, on average, for a manuscript" in sentence 1. So, 513. Sentence 3 is followed by sentence 2. "rejected by one or more others" in sentence 3 is explained by "The reason need not be a fatal flaw in the

research; sometimes the work is simply not splashy enough" in sentence 2. Sentence 4 follows sentence 2 and concludes the paragraph. Hence, 51324.

Ans: (51324)

Solutions for questions 29 to 32:

29. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the paragraph. It introduces the topic of discussion: the Earth is not the centre of the universe. This sentence puts Earth in a negative light. Sentence 2 is followed by sentence 4. "all things do not revolve around it" in sentence 2 links with "only the Moon does so" in sentence 4. Sentence 4 is followed by sentence 1. "Seven decades later Galileo Galilei provided more direct proof" in sentence 1 links with "In 1543 Nicolaus Copernicus proposed" given earlier in sentence 2. "Earth's lack of specialness" in sentence 1 links with "Earth is not the centre of the universe" in sentence 2. Sentence 1 is followed by sentence 5. The pronoun 'he' in sentence 5 refers to "Galileo Galilei" in sentence 1. "the planet Jupiter had four moons of its own, unlike earth, which just had one" in sentence 5 links with "Earth's lack of specialness" in sentence 1. So, 2415. Sentence 3 is the odd man out as it is nowhere related to the other sentences which talk about Earth's lack of uniqueness and mention the positive features of other planets. Sentence 3 needs a precedent and more substantiation and can be a part of another paragraph.

Ans: (3)

30. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It highlights the main point of discussion in the para: What the Polish immigrants brought to Britain. Sentences 5 and 2 form a mandatory pair. "admirable work ethic" in sentence 5 links with "farm labourers picking cabbages at night" in sentence 2. Sentence 1 follows sentence 2. "The first thing" in sentence 5 is followed by "Then" in sentence 1. Sentence 3 with the contrast conjunction 'but' concludes the para by highlighting the most important thing that the Polish immigrants brought to Britain: medical care. So, 5213. Sentence 4 needs a precedent and more substantiation. It is not clear who "they" (mentioned in sentence 4) represents. Ans: (4)

31. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the paragraph. It introduces the term: Delusional disorder. Sentence 4 is followed by sentence 3. "serious mental illness called a "psychosis" in which a person cannot tell what is real from what is imagined" in sentence 4 links with "delusions, unshakable beliefs in something untrue or not based on reality" in sentence 3. Sentence 3 is followed by sentence 5. "presence of delusions" in sentence 3 links with "these delusions" in sentence 5. Sentence 2 (These delusions also involve ...) follows sentence 5 (These delusions mainly involve) and concludes the para. So, 4352. Sentence 1 is the odd sentence out as it cannot be a part of a para that introduces delusional disorders. It talks about diagnosis and treatment which can be discussed in a para that comes much later in the flow.

Ans: (1)

32. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the paragraph. It begins with a major point of discussion: Miracle of capitalism lies in democratising wealth. Sentence 3 is followed by sentence 5. "argued that the miracle of capitalism lies in democratising wealth" in sentence 3 links with "capitalist achievement bringing them within reach of factory girls" in sentence 5. Sentence 5 is followed by sentence 1. "this miracle" in sentence 1 links with "capitalist achievement" in sentence 5. Sentence 4 provides areas where the miracle of capitalism has failed to work magnificently. So, 3514. Sentence 2 is the odd sentence out. "improving productivity in medicine and teaching" in sentence 2 contradicts "failed to operate in health care, education and housing" mentioned in sentence 4.

Ans: (2)

Solutions for questions 33 and 34:

33. The correct word in the first sentence is 'regroup' which means to return to the normal state after an unpleasant experience or a period of difficulty and become ready to make an effort again with new enthusiasm. Reorganize means to change the way in which something is organized or done. Hence 2.

Disinterested means impartial or unbiased. Uninterested means having no interest or liking. A judge needs to be disinterested. It certainly wouldn't be a reason for his refusal. He would have refused since there was nothing in the case that was of interest. Therefore 'uninterested' – 2. Unexceptional means ordinary; unexceptionable, which means without blemish or beyond criticism, is the correct word for the third sentence. Hence 2.

Pillory means to criticize somebody strongly in public. 'pillage' means to steal things from a place or region, especially in a war, using violence. The former is more appropriate. Hence 1.

Ostentatious means expensive or noticeable in a way that is intended to impress people, while ostensible is something which seems or is stated to be real or true, when this is perhaps not the case. Only the former fits in the given context. Hence 1.

Ans: (22211)

34. Ambiguous means vague or unclear; but ambivalent, which means having opposing views or feelings about the same thing, is the appropriate word for the first sentence. Hence 2. The word 'sensual', suggesting an interest in physical pleasure is appropriate in the second sentence. 'sensuous' means relating to or affecting the senses rather than the intellect. Hence 1.

Complacent means self-satisfied and hence unconcerned; complaisant means inclined to please or oblige. Complaisant best fits the sentence. Hence 2.

In the fourth sentence, the appropriate word is 'quietus' which means death. It is clear from the sentence that the brave knight welcomed death with open arms, since his entry into a world of 'eternal glory' has been mentioned. 'Quietude' means the state of being calm and quiet. Hence 1.

The word sentient – able to perceive or feel things – does not bring out the meaning intended in the sentence. 'Sententious' – 'trying to sound important, especially by expressing moral judgements' or 'given to moralizing in a pompous or affected manner' – is apt. Hence 2.

Ans: (21212)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	–
Easy	–
Medium	2, 3, 5, 6, 10, 11, 14, 15, 17, 20, 24
Difficult	1, 4, 7, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23, 25, 27, 29, 33
Very Difficult	26, 28, 30, 31, 32, 34

SECTION – II**Solutions for questions 1 to 4:**

1. Number of points scored in the first quarter = 15
 Number of points scored in the second quarter = 19
 Number of points scored in the third quarter = 20
 Number of points scored in the last quarter = 19
 Hence, the highest number of points were scored in the third quarter. Choice (C)
2. Total number of points scored by Atomic Supermen = 36
 Total number of points scored by Cascade Jaguars = 37
 Hence, the team that won the game scored 37 points. Choice (D)
3. The following table gives the number of points scored by each player:

Alex	4	Jack	6
Max	7	Hugh	10
Glenn	11	Barry	3
Rick	8	Allen	9
Don	6	Bob	9

Hence, Glenn scored the highest number of points.
 Choice (B)

4. The average distances are presented in the following table:

Alex	4.30	Jack	11.1
Max	7.77	Hugh	3.92
Glenn	8.38	Barry	7.10
Rick	6.60	Allen	9.10
Don	3.83	Bob	9.60

The average distance is the highest for Jack.

Alternative Solution:

By observation, we can see that the average distance for Jack is greater than 10 m. The average distance for each of Bob, Glenn and Max is less than 10 m. Hence, the answer is not in the given options. Choice (D)

Solutions for questions 5 to 8:

Since Hari plotted only ten points and connected consecutive points using straight lines, wherever there is a change in the slope of the line, Hari must have made a measurement.

Hence, Hari must have measured the temperature on days 1, 4, 7, 10, 14, 18 and 20 and the temperatures (in °C) are 30, 33, 27, 24, 28, 36 and 34 respectively.

The differences in temperatures between these measurements are 3°C, 6°C, 3°C, 4°C, 8°C and 2°C respectively.

From (i), he must have made at least one measurement between Day 4 and Day 7 and at least one measurement between Day 14 and Day 18. These account for nine measurements in total.

From (ii), Hari's second measurement is the same as the eighth measurement. The second measurement can be on Day 2 or Day 3 or Day 4.

In any of the three cases, for the eighth measurement to be the same as the second measurement, the eighth measurement must have been made between Day 14 and Day 18.

If second measurement was on Day 2, (i.e., of 31°C), the eighth measurement cannot be on any day because on none of the days between Day 14 and Day 18, the temperature measured was 31°C.

Similarly, the second measurement cannot be on Day 4 for the same reason.

The second measurement can be on Day 3 (of 32°C) and the eighth measurement will be on Day 16.

The third measurement must be on Day 4. From (ii) the fourth measurement must be on Day 6.

The following table presents the measurements that Hari made:

Measurement No.	Day	Temperature (in °C)
1	1	30
2	3	32
3	4	33
4	6	29
5	7	27
6	10	24
7	14	28
8	16	32
9	18	36
10	20	34

5. Hari measured the temperature on Day 6.
Choice (C)
6. The average temperature measured by Hari = 30.5°C
Choice (A)
7. The temperatures measured by Hari on Day 1, Day 3 and Day 4 are 30°C , 32°C and 33°C respectively. For the average to be 30°C , the temperature on Day 2 at 9:00 AM must be $120 - 30 - 32 - 33 = 25^{\circ}\text{C}$.
Choice (A)
8. The difference between the fifth measurement and the ninth measurement that Hari took = $36 - 27 = 9^{\circ}\text{C}$.
Ans: (9)

Solutions for questions 9 to 12:

Let (i), (ii) ... (ix) represent the statements in the order in which they are presented in the question.

If Alicia is from Veritum, Cherries are in the North and Kiwis are in the East. Chuck has to be a liar (since he said Alicia always lies). Hence, Derek must also be a truth teller. Hence, Apples are in the West and Bananas are in the South. Therefore, Eleanor is also a truth teller and Bob must be a liar (from (ii)). This is one possible case.

If Alicia is a liar, Chuck must be a truth teller and Derek must be a liar. Since Chuck is a truth teller, the Cherries must be in the South. From (iv) and (vii), Eleanor must also be a liar. Bob can be a truth teller or a liar.

If Bob is a truth teller, then Bananas must be in the East, Apples must be in the North and Kiwis must be in the West.

If Bob is a liar, Apples must not be in the North. From Derek's statement (viii), Apples are not in the West. Since Cherries are in the South, Apples must be in the East. The Kiwis and Bananas will be in North and West in any order.

The following table provides the location of the fruits, with the initials of the names of truth tellers in parenthesis for each case:

Direction	TT: A, D, E	TT: C, B	TT: C
North	Cherries	Apples	Kiwis/Bananas
East	Kiwis	Bananas	Apples
West	Apples	Kiwis	Bananas/Kiwis
South	Bananas	Cherries	Cherries

9. If Alicia is from Veritum, Apples are on the West.
Choice (A)
10. If Kiwis are in the Western part of the island, Chuck is definitely a truth teller.
Choice (C)
11. The maximum number of lies will be spoken when Chuck is the only truth teller. In this case, Apples will be in the East.
Choice (D)

12. If the location of bananas is known, it will help determine which island each person is from.
Choice (B)

Solutions for questions 13 to 16:

Since the difference in the number of marbles in any two piles is even, either all the piles should have even number of marbles or all the piles should have odd number of marbles.

13. Since $n = 150$ and $m = 4$, all the piles can have even number or odd number of marbles.

Case 1:

Consider that there are an even number of marbles. Let the number of marbles in the smallest pile be x . The maximum number of marbles in any pile can be at most $2x - 2$.

To maximize the number of marbles in the largest pile, the number of marbles in the second smallest pile and the third smallest pile must be minimum. Hence, the number of marbles in the second smallest pile must be $x + 2$ and the number of marbles in the third smallest pile must be $x + 4$.

$$\text{Hence, } x + x + 2 + x + 4 + 2x - 2 = 150 \Rightarrow x = 29.2$$

Since a pile cannot have fractional number of marbles, the exact value of x will be an even number close to 29. We can check for $x = 28$ and $x = 30$ and attempt to maximize the number of marbles in the largest pile.

For $x = 28$, we get the number of marbles in the piles as 28, 30, 32 and 54, which add up to only 144. Since the number of marbles in the largest pile must be even and cannot be greater than $28 \times 2 = 56$, the number of marbles in the largest pile must be 54. We can add 2 marbles to each of the three smaller piles to arrive at an arrangement 30, 32, 34 and 54. The maximum number of marbles in any pile will be 54.

Case 2:

Consider that there are an odd number of marbles. Let the number of marbles in the smallest pile be x .

The maximum number of marbles in any pile can be at most $2x - 1$.

To maximize the number of marbles in the largest pile, the number of marbles in the second smallest pile and the third smallest pile must be minimum. Hence, the number of marbles in the second smallest pile must be $x + 2$ and the number of marbles in the third smallest pile must be $x + 4$.

$$\text{Hence, } x + x + 2 + x + 4 + 2x - 1 = 150 \Rightarrow x = 29$$

In this case, the minimum value of x is 29 and the number of marbles in the piles will be 29, 31, 33 and 57. The maximum number of marbles in any pile will be 57.

Hence, the maximum possible number of marbles in a pile will be 57.
Ans: (57)

14. To minimize the number of marbles in the largest pile, the number of marbles in each pile must be as close to each other as possible.

The number of marbles in the piles must be distributed around $184/5 = 36.8$.

Consider that the third largest pile (i.e., the pile which is in the middle) has 36 marbles. In this case, the number of marbles in the five piles will be 32, 34, 36, 38 and 40. However, the sum of the number of marbles add up only to 180. Since 4 more marbles should be added to the five piles, we can add two marbles each to the largest two piles. In this case, the number of marbles in the largest pile will be 42.

If the third largest pile has 38 marbles, then the sum will exceed 184.

Hence, the number of marbles in the largest pile will be 42.
Ans: (42)

15. Since one of the piles has an even number of marbles, all the piles should have an even number of marbles.
 Let the number of marbles in the smallest pile be x .
 The number of piles in the largest pile can be at most $2x - 2$. Between these two numbers, there must be at least 9 distinct even numbers (since there are 11 piles in total). Hence, the difference between x and $2x - 2$ must be at least 20.
 $\therefore 2x - 2 - x = 20 \Rightarrow x = 22$.
 The minimum value of n will be $22 + 24 + 26 + \dots + 42 = 352$
 Choice (C)

16. Given that $m = 15$. The minimum possible value of n can occur when there are an even number of marbles or when there are an odd number of marbles.
 Let there be an even number of marbles in each pile.
 Let the number of marbles in the smallest pile be x . The number of marbles in the largest pile can be at most $2x - 2$. Between these two numbers, there must be 13 distinct even numbers.

$$\text{Hence, } \frac{2x - 2 - x}{2} - 1 = 13 \Rightarrow x = 30$$

In this case, the number of marbles in the smallest pile will be 30 and the number of marbles in the largest pile will be 58.

Let there be an odd number of marbles in each pile.
 Let the number of marbles in the smallest pile be x . The number of marbles in the largest pile can be at most $2x - 1$. Between these two numbers, there must be 13 distinct odd numbers.

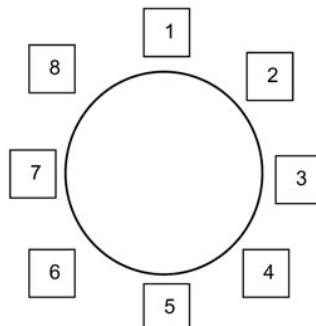
$$\text{Hence, } \frac{2x - 1 - x}{2} - 1 = 13 \Rightarrow x = 29$$

In this case, the number of marbles in the smallest pile will be 29 and the number of marbles in the largest pile will be 57.

Between these two cases, the minimum value of n will occur for the second case.

$$\text{Hence, the minimum possible value of } n = 29 + 31 + 33 + \dots + 57 = \frac{15}{2} \times (29 + 57) = 645$$
 Choice (A)

Solutions for questions 17 to 20:



The following table provides the dishes that each person ordered, the price that he paid and their positions around the table:

Position	1	2	3	4	5	6	7	8
Person	Manan	Ajay	Hari	Giri	Kiran	Dev	Chand	Lalit
Dish	Arepas	Rendang	Ankimo	Marzipan	Poutine	Marzipan	Ankimo	Rendang
Price (in ₹)	250	450	650	750	850	750	650	450

17. Giri ordered Marzipan.

Choice (A)

18. The person sitting to the right of Giri ordered Ankimo.
 Choice (B)

19. Only one person, Manan, ordered Arepas. Kiran is sitting opposite Manan.
Choice (D)
20. The total amount paid by the eight persons = 4800.
Ans: (4800)

Solutions for questions 21 to 24:

From (i), the car manufactured by Tata had a faulty Spark Plug. From (iv), the Maruti was red in colour and had a fault in its Headlights. The car mentioned in (v) is not manufactured by Toyota or Chevrolet. It is not manufactured by Maruti or Tata. From (iii), the Hyundai is Blue in colour. Hence, the car with faulty Fuel Supply is not manufactured by Hyundai (since the former is Black in colour). Hence, this car has to be manufactured by Dodge.

The Hyundai can have a problem in Actuator or Air Conditioning or Brakes. But from (iii), the Grey car had a problem with Brakes. Hence, Hyundai cannot have any fault in its Brakes.

From (ii), the Toyota also did not have problem with its Brakes. Hence, the Chevrolet must be the car with faulty Brakes. From (iii), the Chevrolet must be Grey in colour.

The Hyundai and the Toyota have problem with the Actuator and Air Conditioning in any order.

From (i), the car manufactured by Tata must be Orange in colour and the Toyota must be Yellow.

The following table provides the colour of each car and the fault in each car:

Company	Colour	Fault
Chevrolet	Grey	Brakes
Dodge	Black	Fuel Supply
Hyundai	Blue	Actuator/Air Conditioning
Maruti	Red	Headlights
Tata	Orange	Spark Plug
Toyota	Yellow	Air Conditioning/Actuator

21. The grey car was manufactured by Chevrolet.
Choice (D)
22. The Orange car was manufactured by Tata.
Choice (B)
23. The car manufactured by Chevrolet had a fault in its Brakes.
Choice (C)
24. If the car which had a fault in its Air Conditioning is not Yellow, then it must be Blue. Hence, the Blue car would be the one with a faulty Air Conditioning.
Choice (A)

Solutions for questions 25 to 28:

25. Since Nick can spend at most USD 320 for applying to the colleges, to maximize the number of colleges that he can apply to, he has to apply to colleges with the minimum fee. If he applies to all three Tier III colleges, he will spend USD 120 on fees.

From (iv), he has to apply to Barnett. The total fee will be USD 195.

He can apply to any two colleges from Tier II. He will spend a total of USD 295.

In this case, he will apply to 6 colleges.

He can also apply to all tier III colleges and apply to both Barnett and Greendale. He can apply to one college among Hudson or Edgestow. He will spend USD 320 in this case.

If he applies to Maguire, he cannot apply to Camden. Hence, he can apply to only 2 Tier III colleges, Faber and Okoboji. Since he applied to Okoboji, he must apply to Barnett. In this case, he can apply to a maximum of five colleges.

Hence, if he applies to the maximum number of colleges, he cannot apply to Maguire but he can apply to Barnett and Greendale.

Hence, he cannot apply to Maguire.
Choice (B)

26. To minimize the number of colleges that Nick applies to, we can select as many Tier I colleges as possible. If he applies to all the three Tier I colleges, he would spend USD 225. He has to apply to at least two colleges to spend at least USD 300. From (iii) and (iv), he has to apply to Hudson and Okoboji. Hence, he has to apply to 5 colleges.
Ans: (5)

27. If he applies to Edgestow, Hudson and Poppleton, he would have spent USD 150. From (ii), he cannot apply to Greendale. He can apply to Maguire or Barnett. If he applies to Maguire, he would have spent a total of 150 + 75 = USD 225. He need not apply to any other colleges. If he applies to Barnett, he must apply to Okoboji and he would have spent a total of 150 + 75 + 40 = USD 265. Hence, from the given options, he can apply to Maguire or Barnett.
Choice (D)

28. We can consider for each option whether it is possible to select a combination of colleges without selecting the college given in the option.
Option I: If he applies to Barnett, Poppleton, Hudson, Edgestow and Okoboji, he would have spent USD 265. Hence, it is possible to select a combination of colleges without selecting Maguire.
Option II: From the combination given in the above option, he does not have to select Faber.
Option III: If he does not select Barnett, he cannot select Okoboji. Hence, he can select at most 1 Tier I college (Maguire), 3 Tier II colleges and 2 Tier III colleges. One way of spending more than USD 250 is if he selects Maguire, Poppleton, Hudson, Edgestow and Faber. He will spend a total of USD 265. Hence, he can select Maguire, Poppleton, Hudson, Edgestow and Faber. Hence, he does not have to select Barnett.
Hence, he does not have to select any of the colleges given in the options.
Choice (A)

Solutions for questions 29 to 32:

29. For the number of boys per school to be the highest, the number of boys in the state must be high and the number of schools must be low. By observation, we can see that F has more boys and less schools than A, B, C and E. The number of boys per school for the D, F and G are $\frac{160}{700} \times 1000$, $\frac{140}{500} \times 1000$ and $\frac{90}{300} \times 1000$. Between these three values, the ratio is highest for G which is equal to 300.
Choice (B)

30. The number of boys (in '000) in each of the seven states, A through G, are 85, 120, 70, 160, 120, 140 and 90 respectively. The number of girls (in '000) in each of the seven states, A through G, are 65, 80, 50, 220, 160, 160 and 90 respectively. The number of boys are greater than the number of girls in three states, A, B and C.
Ans: (3)

31. The number of girls (in '000) in each of the seven states, A through G, are 65, 80, 50, 220, 160, 160 and 90 respectively. States A, B, C and E do not have lower number of schools than F but have lower number of girls than F. Hence, the highest number of girls per school will be for state D or F or G. The ratio for these D, F and G are $\frac{220}{700} \times 1000 = 0.314$, $\frac{160}{500} \times 1000 = 0.32$ and $\frac{90}{300} \times 1000 = 0.3$ respectively. Among these three ratios, the highest is for F.
Choice (D)

32. The difference between the number of boys and girls (in '000) for the seven states are 20, 40, 20, 60, 40, 20 and 0 respectively.

By observation, we can see that D will have a higher ratio than B and E (since the difference is higher and the number of schools lower).

Between A and C, C will have the higher ratio. C and F will have the same ratio because the difference and the number of schools is the same.

The ratios for C and D are $\frac{20000}{500}$ and $\frac{60000}{700}$. The highest ratio will be for D and it is 85.714. Choice (C)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	-
Easy	1, 2, 3, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32
Medium	4, 9, 10, 11, 12
Difficult	5, 6, 7, 8, 13, 14, 15, 16, 28
Very Difficult	17, 18, 19, 20

SECTION – III

Solutions for questions 1 to 34:

$$1. \text{ Given } S = \sqrt[3]{3^3} \cdot \sqrt[3]{\frac{1}{3^3}} \cdot \sqrt[3]{3^3} \cdot \sqrt[3]{\frac{1}{3^3}} \dots \infty$$

$$S^2 = 3^3 \sqrt[3]{3^3} S \Rightarrow S^4 = 3^6 (3^{1/3} \cdot S)$$

$$\Rightarrow S^4 - 3^{\frac{19}{3}} (S) = 0 \Rightarrow S = 3^{\frac{19}{9}} = 9^{\frac{19}{18}}$$

(as S cannot be 0) Choice (C)

$$2. M = 10^{10^{10^{10}}} \text{ ends with } N = 10^{10^{10}} \text{ zeroes}$$

N ends with 10^{10} zeroes
 $\Rightarrow P = 10^{10}$
P ends with 10 zeroes i.e., it has a total of 11 digits. Choice (D)

$$3. \text{ The minimum possible values of } x^2y, 6xy, xy^2 \text{ and } (y-3)^2x \text{ are respectively } 45, 90, 192 \text{ and } 12.$$

Hence, $(y-3)^2x$ has the least minimum value. Choice (D)

$$4. \text{ Let the cheaper variety cost } ₹a \text{ per kg less than the effective cost of the mixture.}$$

The data is represented in the alligation tables below

	Cheaper Variety	Dearer Variety
Price	11 - a	18 - a
Price of Mixture	11	
Relative quantity	7 - a	a
Price	11 - a	18 - a
Price of mixture	14	
Relative quantity	4 - a	3 + a

$$\text{We have } \frac{7-a}{a} = \frac{3+a}{4-a} \Rightarrow a = 2$$

\therefore The price of the cheaper variety is $11 - 2 = 9$

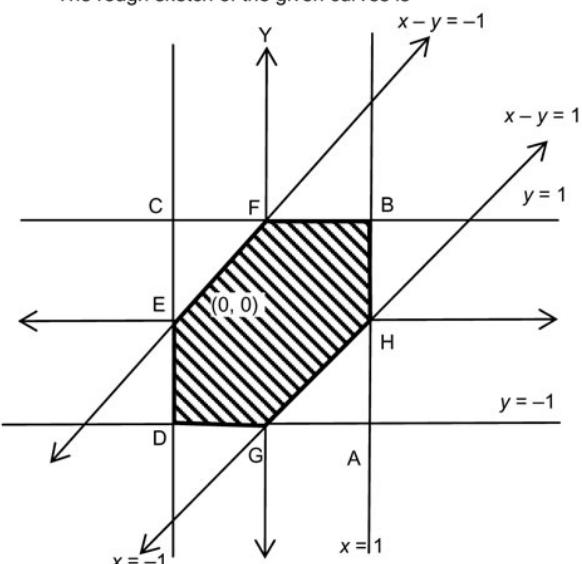
Alternate Solution:

We can also solve the question by using the options as the prices would be x and $x + 7$. Only choice (C) satisfies. Choice (C)

$$5. \text{ There are 4 cards of each denomination in a pack of 52 cards. Each set of four cards of the same denomination can be distributed among 4 persons in } 4! \text{ ways. Hence, the required number of ways is } (4!)^{13} = (24)^{13}$$

Choice (B)

6. $|x - y| = 1$
For $x - y > 0$, $|x - y| = x - y$. So, the curve takes the form $x - y = 1$
and for $x - y < 0$, $|x - y| = y - x$. So, the curve takes the form $x - y = -1$
The rough sketch of the given curves is



Shaded portion is the required region.

∴ Required area = Area of the square ABCD - (Area of \triangle ACEF + Area of \triangle AGH)

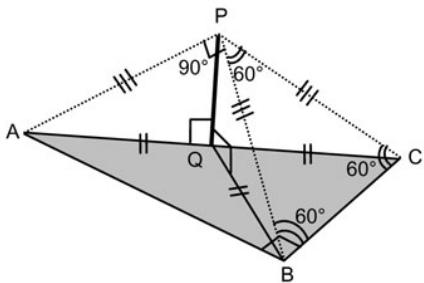
$$= 2 \times 2 - \left(\frac{1}{2} \times 1 \times 1 + \frac{1}{2} \times 1 \times 1 \right)$$

$$= 4 - 1 = 3 \text{ sq. units.}$$

Choice (B)

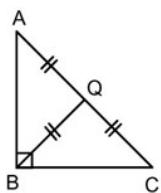
7. Let Ram buy x mangoes and y apples.
 $\Rightarrow 4x + 6y \leq 2000$
Let $y = 1$ and $x = 1$, then $4x + 6y = 10$
Now $4x + 6y$ can assume all even values from 10 to 2000 except 12. Hence, a total of 995 possible values.
Ans: (995)
8. Since Soumya beats Divya by 10 seconds or 50 m, Divya's speed is $\frac{50 \text{ m}}{10 \text{ sec}} = 5 \text{ m/s} = V_{D1}$
∴ To run 300 m at 5 m/s, Divya takes $\frac{300}{5} = 60 \text{ seconds.}$
Since Soumya beats Divya by 10 seconds, Soumya runs 300 m in 50 seconds.
∴ Soumya's speed = $\frac{300}{50} = 6 \text{ m/s} = V_{S1}$
Given that Soumya increases her speed by 1.5 times.
∴ Soumya new speed = $6 \times 2.5 = 15 \text{ m/s} = V_{S2}$
Divya doubles her speed.
∴ Divya's new speed = $10 \text{ m/s} = V_{D2}$
Since Soumya and Divya finish the 2nd race at the same time, after Soumya gives Divya a headstart of 150 m, Soumya must run 150 m more than Divya.
If t is the time for which they run,
 $15t - 10t = 150 \Rightarrow t = 30 \text{ seconds.}$
∴ Distance covered by Soumya, which is also equal to length of the race, is $15t = 15 \times 30 = 450 \text{ m.}$
Choice (A)
9. The distance between two parallel lines $7x + 24y - 21 = 0$ and $7x + 24y + 4 = 0$ is $\frac{|-21 - 4|}{\sqrt{7^2 + 24^2}} = 1$ Choice (A)

10. Let the ABC be the park with $\angle ABC = 90^\circ$.



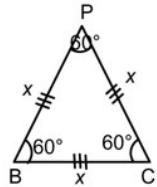
$$\angle APB = 90^\circ \text{ and} \\ \angle BPC = 60^\circ$$

Let PQ be the tower, with Q as its foot and P as its top. It is given that Q is the midpoint of AC i.e., it is the circumcentre. Hence it is equidistant from all the three vertices of the triangle ABC.



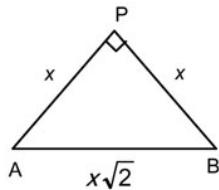
P, the top of the tower, is also equidistant from A, B and C.

Consider the triangle BPC. Let BC = x m



$$\therefore BP = PC = BC = x \text{ m}$$

Similarly consider triangle APB.



$$\therefore AB = x\sqrt{2}$$

Now the area of the triangle ABC

$$= \frac{1}{2} \times AB \times BC$$

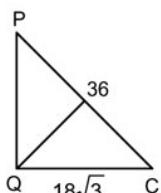
$$= \frac{1}{2} \times x \times x\sqrt{2} = 648\sqrt{2} \text{ (given)}$$

$$\Rightarrow x = \sqrt{1296} = 36$$

$$\Rightarrow BC = 36 \text{ m} (= AP = BP = CP)$$

$$AB = 36\sqrt{2} \text{ m}$$

$$AC = \sqrt{36^2 + 36^2(2)} = 36\sqrt{3} \text{ m}$$



Consider the triangle PQC

$$PQ = \sqrt{PC^2 - QC^2} \\ = \sqrt{1296 - 972} = \sqrt{324} = 18$$

\therefore The height of the tower is 18 m.

Ans: (18)

11. When a cube of side n is cut along the diagonals of a face of the cube, perpendicular to the face, number of unit cubes cut is

$$= 2n^2 - n \text{ when } n \text{ is odd}$$

$$= 2n^2 \text{ when } n \text{ is even}$$

From (A) number of unit cubes cut = $2K^2 + 3k + 1$

$$= 2(k+1)^2 - (k+1)$$

\therefore the side of the cube is an odd integer

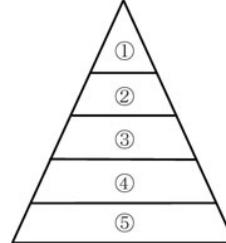
From (B) the number of unit cubes cut is $72k^2 = 2(6k)^2$

\therefore Side of the cube is an even integer.

The question can be answered from either statement.

Choice (C)

- 12.



As the question is about any right circular cone, and all the options are numerical values, it implies that the answer holds good for any set of measurements of r and h. Hence, the convenient values of $r = 5$, $h = 5$ can be used to find out the ratio.

Consider the right circular cone whose section is shown above.

Let the total height = 5 units and base radius = 5 units.

Then the volume of the 3rd piece

$$= \text{Total volume} \times \frac{(3^3 - 2^3)}{5^3}$$

$$\text{Volume of the 5th piece} = \text{Total volume} \times \frac{(5^3 - 4^3)}{5^3}$$

$$\therefore \text{Required ratio} = \frac{3^3 - 2^3}{5^3 - 4^3} = \frac{19}{61} \quad \text{Choice (B)}$$

13. If N^2 has three of its factors less than N, it has also three factors more than N. And N is also a factor of N^2 .

$\therefore N^2$ has $3 + 3 + 1$ i.e., 7 factors

$\therefore N^2$ is of the form P^6 , where P is a prime number

$$\Rightarrow N = P^3$$

$\therefore N^3 = P^9$ and P^9 has 10 factors.

Ans: (10)

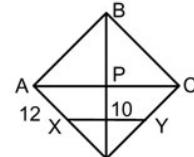
14. Consider the Rhombus ABCD, in right triangle PAD AP

$$= \frac{1}{2} AC = \sqrt{12^2 - 10^2} = \sqrt{44}$$

$$\text{and also } XY = \frac{1}{2} AC$$

(since XY is joining the midpoints of AD and CD in $\triangle ACD$)

$$\therefore XY = \frac{1}{2} AC = \frac{1}{2} \times 2\sqrt{44} = 2\sqrt{11} \quad \text{Choice (A)}$$



15. All the three persons continue to work till all the work is completed, irrespective of the order in which the work is done on the fields. Hence the answer is simply the total work done divided by the total rate of work.

If Tarun has 3 acres (say), then his rate of work is 1/2 acre per hour (because he takes 6 hours to work on his field).

Then Rohit would have 3 acres and his rate of work will be 1/8 acres per hour while Sameer would have 8 acres and his rate of work will be 1/4 acres per hour.

$$\therefore \frac{\text{Total acres}}{\text{Total rate of work}} = \frac{(3+3+8)}{\left(\frac{1}{2} + \frac{1}{8} + \frac{1}{4}\right)} = \frac{14}{\left(\frac{7}{8}\right)} = 16 \text{ hours}$$

Choice (C)

16. Let the initial number of boxes be n and the initial number of cakes be m per box.

$$\therefore m \times n = (m-1)(n+1) + 1$$

$$\therefore m = n \therefore m < n + 1$$

 $\therefore \text{II} > \text{I}$

Choice (B)

17. We need the remainder of squares when they are divided by 5 and 6. Denoting these sets by R_5 and R_6 , we have $R_5 = \{0, 1, 4\}$ and $R_6 = \{0, 1, 3, 4\}$

If two numbers whose last digits belong to R_5 and R_6 respectively are added, the last digit can be $1+1=2$ or $8=4+4$ or $7=3+4$ but it cannot be 6, which appears in Choice (B).

Choice (B)

18. Sum of the first 75 terms of the AP = $75 \times$ middle term

$$= 75 \times T_{38}. \text{ Now } T_{38} = \frac{T_{12} + T_{64}}{2}. \text{ Hence, required answer}$$

$$= 75 \times \frac{\left(23 \frac{7}{29} + 136 \frac{22}{29}\right)}{2} = 75 \times 80 = 6000$$

Choice (C)

19. The area of the region between the circle and the polygon = Area of the circle – Area of the polygon.

Given the radius of the circle = r . The polygon has 12 triangles each with an angle of $\frac{360}{12} = 30^\circ$ included at the centre. \therefore The area between the circle and the polygon

$$= \pi r^2 - 12 \left(\frac{1}{2} r^2 \sin 30^\circ \right) = (\pi - 3) r^2. \quad \text{Choice (B)}$$

20. A trial and error approach is the best way to tackle such a question. Let us consider the same problem for the natural numbers from 1, to say 3, and follow a certain process to arrive at N_m .

$$12|3 \rightarrow 12+3=1|5 \rightarrow 6=N_m.$$

Hence N_m is the sum of all the digits initially written.

If we consider say

$$1|2 3 4 \rightarrow$$

$$23|5 \rightarrow 2|8 \rightarrow 1|0 \rightarrow 1 = N_m.$$

We see that N_m is the remainder when 1234 is divided by 9 (or same as the remainder when $(1+2+3+4)$ is divided by 9). Hence, we see that the actual order of partitioning is irrelevant here. Hence, for 12345...9899100, N_m will be the remainder of $(1+2+3+\dots+98+99+100)$ when divided by 9.

$$\text{Now, } \left(\frac{1+100}{2} \right) \times 100 = 101 \times 50 = 5050$$

$$\therefore R\left[\frac{5050}{9} \right] = R\left[\frac{5+0+5+0}{9} \right] = 1$$

Choice (C)

21. $a+b=c+2d+1 \rightarrow (1)$

$$a-b=c-2d-1 \rightarrow (2)$$

Adding (1) and (2),

$$2a=2c, a=c$$

$$b=c+2d+1-a=2d+1$$

As c is odd, a is odd.

A number of the form $2d+1$, when d is an integer is always odd. Hence b is odd.

Hence both a and b are odd.

Choice (B)

22. $18^{49} + 18^{50} + 18^{51} = 18^{49}(1+18+324) = 18^{49}(343)$
 $19^{51} - 19^{50} - 19^{49} = 19^{49}(19^2 - 19 - 1) = 19^{49}(341)$

Dividing II by I, we get

$$\left(\frac{19}{18} \right)^{49} \left(\frac{341}{343} \right) = \left(1 + \frac{1}{18} \right)^{49} \left(\frac{341}{343} \right)$$

$$\text{Now } \left(1 + \frac{1}{18} \right)^{49} = (1 + 49 \times \frac{1}{18} + \dots) > 2$$

$$\text{Clearly, } \left(1 + \frac{1}{18} \right)^{49} \left(\frac{341}{343} \right) > 1$$

Hence quantity II is greater.

Choice (B)

23. $a = \frac{a+b}{b} + \frac{1}{b}$
 $ab = a+b+1$

$$a = \frac{b+1}{b-1} = 1 + \frac{2}{b-1}$$

Since a is a whole number $b-1$ should be a factor of 2. \therefore The possible values of $b-1$ are 1 and 2. \therefore The possible values of b are 2 and 3. \therefore The possible ordered pairs of (a, b) are (3, 2) and (2, 3).**Alternative Solution:**

Since $ab - a - b - 1 = 0$, add 2 on both sides to get $ab - a - b + 1 = 2$, i.e., $(a-1)(b-1) = 2$.

The only possibility is $1 \times 2 = 2$ or $2 \times 1 = 2$ i.e., $(a, b) = (2, 3)$ or $(3, 2)$.

24. Given $E = 2x^2 + 3y^2 - 6x + 9y + 15$
 $= 2x^2 - 6x + 3y^2 + 9y + 15 = 2(x^2 - 3x) + 3(y^2 + 3y) + 15$

$$= 2\left(x - \frac{3}{2}\right)^2 + 3\left(y + \frac{3}{2}\right)^2 + 15 - 2\left(\frac{9}{4}\right) - 3\left(\frac{9}{4}\right)$$

$$= 2\left(x - \frac{3}{2}\right)^2 + 3\left(y + \frac{3}{2}\right)^2 + \frac{15}{4}$$

So, if $x = \frac{3}{2}$ and $y = \frac{-3}{2}$, E has its minimum value, i.e.,

$\frac{15}{4}$. The smallest integer greater than $\frac{15}{4}$ is 4.

 \therefore The minimum integral value of E is 4. Ans: (4)

25. $y = \frac{2^0 - 2^{-\theta}}{2}; x = \frac{2^0 + 2^{-\theta}}{2}$

$$t = \frac{2^0 - 2^{-\theta}}{2^0 + 2^{-\theta}}; s = \frac{2}{2^0 + 2^{-\theta}}$$

$$\Rightarrow t^2 + s^2 = \frac{2^{2\theta} - 2 + 2^{-2\theta}}{2^{2\theta} + 2 + 2^{-2\theta}} + \frac{4}{2^{2\theta} + 2 + 2^{-2\theta}} = 1$$

i.e., $t^2 + s^2$ is a constant function.

Its minimum/maximum/all possible values are/is 1.

Hence, required ratio = 1

Choice (B)

26. Let the cost per kg be ₹1000.

 \therefore Selling price = ₹1200

But the cost is only for 800g = ₹800

$$\text{Profit} = \frac{1200 - 800}{800} \times 100 = 50\% \quad \text{Choice (C)}$$

27. The factors of 1024 are 1, 2, 4, 8, 16, 32, 64, 128, 256, 512 and 1024.

All of them are powers of 2.

i.e., $2^0, 2^1, 2^2, \dots, 2^{10}$ Sum of factors of $2^0 = 2^1 - 1 = 1$ Sum of factors of $2^1 = 2^2 - 1 = 3$ Sum of factors of $2^{10} = 2^{11} - 1$

\therefore The required sum
 $= (2^1 - 1) + (2^2 - 1) + (2^3 - 1) \dots (2^{11} - 1)$
 $= (2^1 + 2^2 \dots 2^{11}) - 11 = (2^{12} - 2) - 11 = 4083.$

Ans: (4083)

28. As the logs are in AP, the numbers are in G.P

i.e., $3(3^x + 13/3) = 2^{2x}$
 $\Rightarrow 3^{x+1} + 13 = 2^{2x}$
From the options $x = 1 \Rightarrow 3^{x+1} + 13 = 22$
 $x = 2 \Rightarrow 3^{x+1} + 13 = 40$
 $x = 3 \Rightarrow 3^{x+1} + 13 = 94$
 $x = 4 \Rightarrow 3^{x+1} + 13 = 256$
 $2^{2x} = 256$
 $x = 5 \Rightarrow 3^{x+1} + 13 = 742$
 $\therefore x = 4$

Ans: (4)

29. $f_1(x) = \frac{1}{f_2(x)} = f_3(x) = \frac{1}{f_4(x)}$

$\Rightarrow f_{\text{odd}}(x) = \frac{1}{f_{\text{even}}(x)}$

If k is odd,
then $(k + 1)$ is even.
So, $k(k + 2)$ is odd and $(k + 1)(k + 3)$ is even (or vice versa)

$f_{(\text{odd})}(x) \times \frac{1}{f_{(\text{even})}(x)} = 1$

$\Rightarrow \sum_{k=1}^{100} (1) = 100$

Choice (B)

Solutions for questions 30 and 31:

30. Given that there are 10 pairs of white socks, 12 pairs of black socks and 14 pairs of yellow socks.

Consider that I pick exactly three socks. The worst possible scenario is that each is of a different colour. However, the fourth will be of the same colours as one of the first three. Hence, it is sufficient to draw four socks to be certain of getting one pair of socks of the same colour. Choice (D)

31. Even if $(12 + 14) \times 2 = 52$ socks are picked, I could (in the worst case) end up with 12 pairs of black and 14 pairs of yellow socks. But if I pick two more socks, that is a total of 54 socks, I can be certain of drawing at least one pair of socks of each colour. Choice (C)

32. A minimum of 1001 reversals need to be performed to reverse all the rays. Any extra reversal(s) would have to be undone to again end up with a reversed ray(s).
 $\therefore R$ must be of the form $N + 2E$ where $2E$ denotes the number of extra reversals carried out.

$\therefore R$ must be odd and must be at least 1001.
Only choice (D) satisfies this condition. Choice (D)

33. The n terms are distributed into 8 sub-series. If a sub-series has an odd number of terms, the average of the sub-series would be a term of the same sub-series. If it has an even number of terms, the average would not be a term of the sub-series. As the average lies in the same sub-series for 3 of the 8 sub-series the number of terms, i.e., n has to be of the form '(An even multiple of 8) \pm 3' i.e., $16k \pm 3$ where k is a natural number.

Among the given choices, only 51 and 77 are the possible values. Hence n can assume two of the values.

Choice (B)

34. Let the number of direct roads from A to B be p , B to C be q and C to A be r .

Then,
 $p + rq = 25 \dots (1)$

$q + rp = 17 \dots (2)$

(1) – (2) gives,
 $(p - q) + r(q - p) = 8$

$\Rightarrow q - p = \frac{8}{r-1}$

Now, $q - p$ is a positive integer

i.e., $\frac{8}{r-1}$ is a positive integer

$\Rightarrow r = 2, 3, 5 \text{ or } 9 \dots (3)$

(1) + (2) gives,

$(p + q) + r(p + q) = 42 \Rightarrow p + q = \frac{42}{r+1}$

Now $p + q$ is an integer

So, $\frac{42}{r+1} \Rightarrow r = 1, 2, 5, 6, 13, 20 \text{ and } 41$ must be an integer.

\therefore from (3) and (4), $r = 2$ or 5

If $r = 2$, (1) $\Rightarrow p + 2q = 25 = 25$ and (2) $\Rightarrow 2p + q = 17$

$\therefore p = 3$ and $q = 11$

If $r = 5$, (1) $\Rightarrow p + 5q = 25$ and (2) $\Rightarrow 5p + 1 = 17$

$\therefore p = 2.5$ and $q = 4.5$. As p, q are integers, $r = 2$, $p = 3$ and $q = 11$.

Ans: (2)

Difficulty level wise summary - Section III

Level of Difficulty	Questions
Very Easy	–
Easy	1, 3, 16, 18, 21, 26, 30, 31, 32
Medium	2, 4, 7, 8, 9, 11, 13, 14, 15, 17, 19, 22, 23, 25, 28
Difficult	5, 6, 10, 12, 20, 24, 27, 29, 33
Very Difficult	34