

**(Key and Solutions for AIMCAT1722)**

**Key**

**SECTION – I**

1. C	8. B	15. B	22. D	29. B
2. D	9. A	16. A	23. C	30. A
3. B	10. B	17. C	24. A	31. D
4. C	11. C	18. C	25. 42513	32. 3
5. D	12. A	19. B	26. 25143	33. 4
6. B	13. B	20. C	27. 35214	34. 3
7. D	14. A	21. D	28. 54132	

**SECTION – II**

1. 6	8. D	15. D	22. 1082	29. B
2. 32	9. 9	16. A	23. D	30. D
3. A	10. 3	17. B	24. C	31. C
4. A	11. 5	18. B	25. 32	32. C
5. B	12. C	19. D	26. A	
6. D	13. B	20. 2	27. A	
7. B	14. B	21. D	28. 32	

**SECTION – III**

1. C	8. 28	15. 4	22. 35000	29. B
2. 10	9. C	16. 76	23. D	30. 12
3. 2	10. B	17. D	24. A	31. A
4. 2500	11. B	18. B	25. 7	32. 1
5. A	12. D	19. 44	26. A	33. A
6. 40	13. D	20. B	27. A	34. B
7. C	14. 1097	21. D	28. 15	

**Solutions**

**SECTION – I**

**Solutions for questions 1 to 3:**

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

Number of words : 582

- Refer to para 3. The sandal was made of sagebrush bark fibre. Statement I: '10.5 millennia' is just another way of saying 10500 years. The sandal may be the world's oldest example of footwear. So statement I is true.
- Statement II: The sandal was worn by a native North American who lived in caves during the winter months and hunted in marshes in summer. It has not been stated in the third paragraph that the sandal was worn only in the winter months. We cannot infer that the sandal was worn only by Native North Americans. So statement II cannot be concluded.
- Statement III: "you can feel the imprint of a big toe" implies that statement III can be concluded.
- Statement IV: It has been explicitly mentioned in the second sentence of para 3 that the sandal is housed in the University of Oregon Museum of Natural and Cultural History. So statement IV is incorrect.

Hence, only statements I and III can be concluded.

Choice (C)

**2.** Option A: We can infer from Erik Trinkau's comparison in para 5 that Neanderthals did not wear shoes (whereas our ancestors did). The passage only states that our ancestors wore shoes 26000 years ago (see paragraph 3), but not whether the shoes were invented then or previously, so choice A is wrong.

Option B: The M2 Trekker is the latest in space footwear and not the first shoe to enter space. So choice B is wrong.

Option C: Choice C is contradicted by the penultimate sentence of para 5. Shoes make their wearers' feet weaker because of the **increased** support they provide. Hence choice C is incorrect.

Option D: Choice D is correct, as it is stated in the first sentence of para 5.  
Choice (D)

**3.** The given conclusion of the author appears in the last sentence of the last paragraph of the passage.

Option A: Choice A is derived from the last sentence of the penultimate paragraph and is not directly related to the author's conclusion in the last paragraph. Therefore, choice A is eliminated.

Option B: According to Jenna Tedrick Kuttruff, the weavers of the ancient sandals she has studied made them not just visually attractive, but also different from each other, though there was no need to do so. This implies that the makers' motives were not rooted in necessity but in aesthetics i.e. in order to be fashionable.

Option C: Choice C is a partial answer. The shoes were not only visually attractive but also different from each other.  
Option D: The first part of choice D is a far-fetched judgment and the second part of choice D is neither stated nor implied.

Choice (B)

#### Solutions for questions 4 to 9:

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

Number of words : 625

4. The passage asks the question "What on earth could the fictional detective teach an aspiring neurologist?". The passage also answers this question by saying "the insights provide a welcome lesson in the art of rational thinking".

Option A: The cases that Sherlock Holmes are usually criminal cases and they are not similar to the cases that a neurologist needs to diagnose. Hence, this is not the correct answer.

Option B: while the passage mentions that the character of Sherlock Holmes might have been inspired by "one of the leading doctors of the day, Joseph Bell of the Royal Edinburgh Infirmary", there isn't enough evidence in the passage to conclude that Holmes was well versed in medicine.

Option C: The passage mentions various qualities of Holmes and finds similarities between these qualities and the teachings of Gowers, a neurologist. Hence, the qualities of Holmes will help a neurologist in solving his/her cases. Therefore, this is the correct answer.

Option D: The passage does not mention much about the cases of Holmes and we cannot infer from the passage that the cases that Holmes solves involve neurological conditions. Hence, this is not the correct answer.

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

5. The passage mentions that Gowers taught his students to start their diagnosis as soon as a patient walks into the room. This case was mentioned by the author to begin out one of the similarities between Holmes and Gowers.

Option A: Gowers emphasized that observing a patient is important and he does not say that it is not as important than the symptoms. Hence, this cannot be the correct answer.

Option B: While Gowers mentioned that doctors should learn to observe their patients, he does not mention that every person should be profiled by everyone. Only the patients who are in need of a diagnosis should be observed. This tenet of Gowers is similar to that of Holmes who profiles "each person he meets based on the scantest of clues". Hence, this is not the correct answer.

Option C: The author does not mention that inconsequential traits reveal more than the ones considered important. Hence, this cannot be the right answer.

Option D: The primary reason for the author to mention this case is to bring out the similarity between Holmes and Gowers. This similarity is "the importance of the seemingly inconsequential that seems to inspire both men". This option accurately rephrases this principle which both Holmes and Gowers follow. Hence, this is the correct answer.

Choice (D)

6. Gowers states that to emphasize the importance of not letting "your preconceptions fog your judgement".

Option A: While Gowers asks his students to forget all "your types and all your names", he does not confine himself only to theoretic al knowledge. Any knowledge that one gains from one's experience will also create bias when understanding an unfamiliar case. Also, he does not mention that one must forget "all your types and all your names" for most of the cases. He recommends that only when one comes across an unfamiliar case. Hence, this is not the correct answer.

Option B: This option correctly captures the meaning of the quotation presented in the question. An unfamiliar case must be treated as a unique case without typecasting it. He states that one must "Deal with the case as one that has never been seen before, and work it out as a new problem sui generis". Hence, this is the correct answer.

Option C: Not all cases need to be worked out as a new case. Only cases which are unfamiliar must be done so. Hence, this option is incorrect.

Option D: This statement may or may not be true but this was not the point that Gowers was trying to emphasize. Hence, this option is also incorrect.

Therefore, option B is the correct answer.

Choice (B)

7. The passage mentions several similarities between Gowers and Holmes.

Option A: According to the passage, "it was the importance of the seemingly inconsequential that seems to inspire both men". Hence, this is one of the similarities between the two.

Option B: The passage also mentions that both men "reasoned backwards", i.e., "dissecting all the possible paths that may have led to a particular disease (in Gowers' case) or murder (in Holmes')". This is the same as identifying various causes for an effect and zeroing in on one. Hence, this is also a similarity between the two men.

Option C: The passage also mentions that the most important lesson that can be learnt from both of them is "the value of recognizing your errors". Hence, this is also a similarity.

Option D: While Holmes has a habit of "profiling each person he meets based on the scantest of clues", Gowers recommended this method for his patients and not for every person that one meets. Hence, this is not a similarity.

Therefore, option D is the correct answer.

Choice (D)

8. The man initially misdiagnosed with a psychological disturbance similar to hysteria was a painter. This example was provided to highlight the powers of observation of Gowers.

Option A: We cannot conclude that the doctor who misdiagnosed him was not aware of his profession. Hence, this is not the correct answer.

Option B: According to Gowers, since the man was a painter, he was "being poisoned by his pigments". The record of this was observed by Gowers in his gums. Hence, the painter must have ingested the pigments in some manner. Hence, this is the correct answer.

Option C: The patient could not have swallowed large quantities of paint. If this was the case, then there would have been very little chance of him being misdiagnosed. Hence, this cannot be the correct answer.

Option D: Gowers did not observe the gums of the patient first. He first made a note of his profession and formed a theory that he might have been poisoned by his pigments. He found the proof for this in his gums. However, this option states the opposite, i.e., he noticed the gums first and inferred the profession of the patient from the gums. Hence, this is not the correct answer.

Therefore, the correct answer is option B.

Choice (B)

9. According to the passage, both the men "reasoned backwards". They listed out all possible paths that may have caused a disease or a crime and studied and eliminated each path.

Option A: This option implies that when each possible alternative is studied and eliminated, whatever remains must be the truth. This is the underlying principle of the approach mentioned in the passage about "dissecting all possible paths" (i.e., examining and eliminating all the possible alternatives) to find the cause of any disease or murder. Hence, this option is correct.

Option B: While this statement may be true, this does not capture the essence of the statement mentioned in the passage.

Option C: The passage does not mention anything about the probability of each possible path. They may have unequal probabilities. Hence, this is not the correct answer.

Option D: While both the men hold this belief, this is not highlighted in the statement mentioned in the question. It highlights the importance of reasoning backwards. Hence, this is not the correct answer.

Therefore, option A is the correct answer.

Choice (A)

**Solutions for questions 10 to 12:****Number of words and Explanatory notes for RC:**

Number of words : 471

10. The passage mentions various differences between the modern comics and Mayan comics.

Option A: According to the Wichmann, the Mayan comics were "highly valued, whereas in modern societies comics are frowned upon". The passage also says that "far from being throwaway escapism", the Mayan comics "were considered prized objects". Hence, this option is correct.

Option B: The passage mentions that unlike modern comics, Mayan comics "mainly depicted just a few scenes from well-known stories". The passage does not mention that Mayan comics depicted informative and/or abstract ideas. Hence, this difference is not mentioned in the passage and is the correct answer.

Option C: The passage mentions the observations of Neil Cohn who says that the Mayan comics "will have their own conventions too" and that the comics "follow distinct rules when constructing their stories". Hence, this difference is mentioned in the passage.

Option D: The passage mentions that "in the modern world, there's a certain snobbery around telling comic strips". However, "if Gaiman had been a Mayan artist", his experience would have been different. He would have been considered as an artist who produces "high quality art". Hence, this option is also incorrect.

Therefore, the correct answer is option B.

Choice (B)

11. The author states that "in the modern world, there's a certain snobbery around telling comic strips" and gives an example of praise received by Gaiman.

Option A: While this option is true, the author does not intend to imply this when he says that "we are damning them with faint praise". The author implies that because of the faint praise that we give them, we are acting condescendingly. Hence, this option is incorrect.

Option B: The passage does not mention that comic artists are snobbish. It only mentions that "there's a certain snobbery around telling comic strips". Hence, this is not correct.

Option C: The comic writers are usually belittled, i.e., "we are damning them with faint praise" even as they are praised. The example given in the passage about Gaiman and his reaction to the praise confirm that the praise that comic writers receive is usually condescending. Hence, this is the correct answer.

Option D: The passage does not talk about the amount of praise received by the comic writers. Hence, this option is incorrect.

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

12. According to Neil Cohn, the Mayan comics and modern comics are not the same thing. "Even though the drawings on Mayan vessels may look like modern comics, they will have their own conventions too."

Option A: If the rules in Mayan comics and modern comics are similar, then it will weaken Cohn's claim that Mayan comics will have their own conventions. Since Cohn also states that comics carry "distinct rules when constructing their stories", this statement will weaken his claim.

Option B: This statement might weaken another claim that Cohn has made in the passage (unrelated to Mayan comics) that "communicating with visual narratives may be as natural as speech or hand gestures". However, as this does not pertain to Mayan comics specifically, this is not the correct answer.

Option C: If there are a lot of differences in Mayan comics and modern ones, this will only strengthen his claim. Hence, this is not the correct answer.

Option D: If Mayan stories are incomplete, it neither reinforces nor weakens his claim. Hence, this option is also incorrect.

Therefore, the correct answer is option A.

Choice (A)

**Solutions for questions 13 to 18:****Number of words and Explanatory notes for RC:**

Number of words : 515

13. The findings of American Stroke Association establish a correlation between 7-8 hours of sleep and risk of stroke.

Option A: The author mentions the findings to emphasize the relation between sleep and stroke. The factor of exercise mentioned in the passage is not central to the passage because the author only talked about sleep in the previous paragraph. Hence, this is not the correct answer.

Option B: The author, by presenting the findings, emphasized the correlation between sleep duration and risk of stroke. Hence, this is the correct answer.

Option C: The passage does not talk about the risk of the author getting a stroke. Majority of the passage talks about sleep in humans, in general, and does not talk about the author in particular. Hence, this is not the correct answer.

Option D: While the passage mentions that disturbed sleep is an "urban phenomenon", the findings do establish neither correlation nor causation between urbanization and sleep deprivation. Hence, this option is also incorrect.

Therefore, option B is the correct answer.

Choice (B)

14. According to the journal *Sleep*, "Weight loss from dietary change can make you sleepier, regardless of what you weigh".

Option A: This option accurately rephrases the findings of the study mentioned in the passage. People will feel sleepier if they lose weight from diet changes. Hence, this option is correct.

Option B: This finding is from older studies but not the one published in the journal *Sleep*. Hence, this option is incorrect.

Option C: The study mentions that dietary changes can "make you sleepier". Hence, we cannot conclude from this that such people do not have to sleep longer. Hence, this option is also incorrect.

Option D: Since this option does not mention anything about changes, this option is incorrect.

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

15. The passage discusses various aspects related to sleep and also discusses quality of sleep in a few paragraphs.

Option A: This is not true since the passage mentions that primates sleep longer than humans but their quality of sleep is not better than that of humans. Hence, this is not the correct answer.

Option B: The passage mentions that "losing weight can give you more daytime energy and improve the quality of sleep". Hence, quality of sleep can be improved by losing weight.

Option C: The passage does not talk about the relation between exercise and better quality of sleep. Hence, this option is also incorrect.

Option D: The passage disabuses the reader "of some popularly held notions" one of which is "people who live simpler, close-to-nature lives get better sleep". Hence, the passage sets out to disprove this option. Therefore, this option is also incorrect.

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

16. According to the passage, humans sleep for 7-8 hours a day and primates sleep for 14-17 hours a day. However, the REM phase of the sleep in humans lasts for 25% of their sleep while for primates it lasts for 5%.

Option A: The REM phase of sleep for humans is around 2 hours. For primates it is around 40-50 minutes. Hence, the REM phase is shorter in primates but they sleep longer. Therefore, this option is correct.

Option B: The duration of REM sleep is not the same in humans and primates. Hence, this option is incorrect.

Option C: Humans do spend more time than primates in REM phase. However, humans are not arboreal (living in trees). Hence, this option is incorrect.

Option D: While the passage mentions quality of sleep and duration of sleep, it doesn't establish a concrete relation between the two. The quality of sleep is not dependent on the duration of sleep and it would be incorrect to say that sleeping for shorter durations implies a better quality of sleep. Hence, this option is also incorrect.  
Therefore, option A is the correct answer.

Choice (A)

17. The passage mentions that primitive humans "get slightly less sleep than we do".

Option A: While it is true that primitive humans get less sleep than us, we cannot conclude anything about the quality of their sleep. While the preceding paragraph used REM phase of sleep to indicate the quality of sleep (when comparing humans' sleep with that of primates), the passage does not mention anything regarding the quality of sleep of primitive humans and us. Hence, this option cannot be inferred completely from the passage.

Option B: Since we cannot compare the quality of sleep, this option is also incorrect.

Option C: This option is correct because the passage does not mention anything about the quality of sleep. But it is true that they slept for shorter times.

Option D: The passage does not mention that the primitive humans had disturbed sleep. Hence, this option also cannot be inferred.

Therefore, the correct answer is option C.

Choice (C)

18. The passage provides a few benefits of the short efficient sleep cycle of humans in the final paragraph.

Option A: The short efficient sleep cycle did not help the humans to discover fire. When they discovered fire, their sleep improved. Hence, this option is incorrect.

Option B: While the short sleep cycles did free up their time, we cannot infer from the passage that they developed efficient hunting practices.

Option C: The passage mentions that better sleep "freed up time for learning and bonding". Hence, the short sleep cycles helped them learn new things and bond with others.

Option D: The passage does not mention that they became fit because of their sleep. Hence, this option is also incorrect.

Hence, option C is the correct answer.

Choice (C)

#### Solutions for questions 19 to 24:

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

Number of words : 564

19. This statement occurs at the start of the second paragraph of the passage. The first paragraph talks about how it is important to understand the "setting in which both plant and man evolved their mutual understanding" for discussing the early history of potato. The "problem" in the statement refers to the problem of discussing the early history of potato.

Option A: The problem, as understood from the first para, is discussing the history of the potato without examining the other two aspects spoken of. There is not enough to indicate that discussing the history involves understanding why cultivation seems localized.

Option B: The passage mentions that it is important to understand the "setting in which both plant and man evolved their mutual understanding". This problem of understanding the setting and the early history of potato is only limited to South America, as examined and explained in the subsequent paragraphs. Hence, this is the correct answer.

Option C: Referring to the problem as identifying the factors responsible for the growth of potato in South America is prematurely narrowing the scope of the problem defined by the author in the first paragraph. Hence, this is not the correct answer.

Option D: The passage is not confined only to South America and nor does it talk about the relation between the

culture of South America and the cultivation of potato. Hence, this is not the correct answer.  
Therefore, the correct answer is option B.

Choice (B)

20. According to the passage, the Spanish Conquest destroyed the civilization in Mexico when they "were on the point of developing an independent culture of the potato". Also, after the Spanish Conquest, "the Peru-Bolivian potato which was imported and grown" in Mexico.

Option A: The Spanish conquest did not destroy an independent culture, but it destroyed the civilization when they were on the verge of developing an independent culture. Hence, this is not the correct answer.

Option B: While the passage states that the Peru Bolivian potato was introduced in Mexico after the Conquest, it cannot be inferred from the passage that this potato was introduced because of the Conquest. Hence, this is not the correct answer.

Option C: The Spanish conquest destroyed the civilization in Mexico when they were "on the point of developing an independent culture of the potato". Because of this, they destroyed any chance of an independent strain of potatoes being developed in North America. Hence, this is the correct answer.

Option D: The passage clearly states that these regions were united under the Incas before the Spanish Conquest. Hence, this option is also incorrect.

Therefore, the correct answer is option C.

Choice (C)

21. The passage mentions that while potatoes were cultivated in South America, it was not cultivated in North America. The solution to this is "almost certainly to be found in the extraordinary geographical and climatic conditions of the area into which the settlers penetrated".

Option A: The passage mentions that to the north of the equator, maize was easily grown which was highly bounteous. However, it does not mention that the geography and climate in the north did not permit the cultivation of potato. In addition, the passage also states that "Mexico, in particular, is so rich in such plants and the tubers of some of these wild plants are at times eaten by the natives". Hence, this option is incorrect.

Option B: According to the passage, the people from Mexico "were on the point of developing an independent culture of the potato when the coming of the Spaniards destroyed their civilization". However, the passage does not talk about the tools required for the cultivation of potatoes. Hence, we cannot infer that the Spaniards destroyed their civilization as soon as they developed the required tools.

Option C: The passage states that Mexico was "rich in such plants". Such plants here refer to the wild potatoes. Hence, this option is incorrect.

Option D: The cultivation of maize and manioc, which are bounteous, provided sufficient sustenance for the people in the north. Hence, they did not look for other foods for cultivation. In the south, where "manioc is wanting and maize begins to fail", they found a staple food in potato. Hence, this is the correct answer.

Choice (D)

22. According to the passage, the high altitudes, "by reason of their isolation and their freedom from malaria and the diseases of the jungle, afforded a permanent home in which the immigrants attained for a time a level of culture only a little below that reached later on the Peruvian coast".

Option A: The immigrants in the high altitudes attained a level of culture which was reached later on the Peruvian coast. Hence, this option is incorrect.

Option B: While there might have been abundant wild potatoes in the higher altitudes, we cannot infer that the primary reason for settling in the high altitudes was because of the availability of the potatoes. Hence, this option is incorrect.

Option C: The passage mentions that on the high tablelands, the people searching for staple food, "eventually found it in the wild potato". Hence, we cannot say that the

immigrants "introduced" potatoes in this region. Further, the high altitudes offered protection to the people from diseases and not to the crops. Hence, this option is incorrect.

Option D: The high altitudes offered protection from diseases because of which they formed permanent settlements. This led to the cultivation of potatoes. Hence, this is the correct answer.

Choice (D)

23. The passage mentions various factors which contributed to the cultivation of potatoes in South America.

The passage mentions high altitudes and the lack of diseases (of the jungle) afforded a permanent home to the natives, which in turn favoured cultivation of the potatoes. The immigrants searching for food found it in the wild potatoes. Hence, the endemic wild potatoes also played a part. We cannot infer from the passage whether Spanish Conquest and Incas played any part in the cultivation of potatoes in South America. Hence, the answer is only I, II and IV, i.e., option C.

Choice (C)

24. According to the passage, "it is a matter of no small importance to determine how and from what direction the original immigrant natives, the first who cultivated the potato, reached the area we are discussing". This is important because man's experience in "an environment influences the structure of the society" that he builds. Hence, the environmental influence before, during and after his immigration influences his reaction to the available food sources in the new environment.

Option A: The environmental influence on the natives will affect his behaviour. This affect will play a part in what he views as food and how he plans to utilize the food sources. Since this option also states the same, this is the correct answer.

Option B: The passage does not mention that the natives carried potatoes with them when they immigrated. It mentions that there were wild potatoes in the region when the native arrived. Hence, this option is incorrect.

Option C: The natives' material and psychological experience with potato crops is important. However, this is not a reason for understanding the direction from which they reached South America. Hence, this option does not explain why it is important to understand how and from where the original immigrants arrived.

Option D: While the immigrant natives could have had different reactions, it does not necessarily explain why it is important to study the origin of the immigrant natives. Hence, this option is also incorrect.

Therefore, option A is the correct answer.

Choice (A)

#### Solutions for questions 25 to 28:

25. On a careful reading of the sentences, it can be inferred that sentence 4 is a general sentence that begins the paragraph. It introduces the topic: Glaciers are melting. Sentences 4 and 2 form a mandatory pair. Sentence 2 with the contrast conjunction 'but' follows sentence 4. "Glaciers in the mountainous Karakoram region of Asia" in sentence 2 contrasts "Glaciers around the world are melting" in sentence 4. Sentence 5 continues the discussion. "Some" in sentence 5 refers to "glaciers" in sentence 2. "Some are expanding" in sentence 5 reiterates "glaciers aren't melting" in sentence 2. Sentence 1 follows sentence 5. "this mysterious glacial stability" in sentence 1 has been pointed out in the earlier sentences 2 and 5. Sentence 3 brings the discussion to a close by mentioning a reason or explanation for the mysterious glacial instability and helps corroborate sentence 1. Precipitation drops in summer across the Himalayas except in Karakoram, where snow dominates. Hence 42513.

Ans: (42513)

26. On a careful reading of the sentences, it can be inferred that sentence 2 is a general sentence that begins the paragraph. It highlights the misconception that circumstantial evidence is less valid or less important than

direct evidence. Sentences 2 and 5 form a mandatory pair. "This" in sentence 5 refers to "the popular misconception" mentioned in sentence 2. "direct evidence is popularly, but mistakenly, considered more powerful" in sentence 5 corrects "circumstantial evidence is less valid or less important than direct evidence" in sentence 2. Sentence 1 follows sentence 5 as it elaborates on the point mentioned in sentence 1. criminal prosecutions and civil charges are based on circumstantial evidence. Sentence 4 follows sentence 1 with an example of convicted American Bomber Timothy McVeigh. Sentence 3 closes the paragraph with an example of another high-profile conviction based heavily on circumstantial evidence. So, 25143. Ans: (25143)

27. On a careful reading of the sentences, it can be inferred that sentence 3 is a general sentence that begins the paragraph. It mentions the early history details of Bitcoin. It can be observed that sentence 5 has to precede all the remaining sentences as it mentions a common point: the (trading) action associated with the Bitcoin. So sentence 5 follows sentence 3. Sentence 2 elaborates on the initial trading history of the Bitcoin. They initially traded for next to nothing. Sentences 2 and 1 form a mandatory pair. "next to nothing" in sentence 2 links with "The first real price increase occurred" in sentence 1. Sentence 4 closes the discussion. It must be gathered that "since then" in sentence 4 refers to July 2010 and not to 2009. Sentence 4 cannot be placed after sentence 3. Sentence 4 is best placed at the end of the paragraph as placing it in between other sentences will disrupt the thought-flow. Hence, 35214.

Ans: (35214)

28. On a careful reading of the sentences, it can be inferred that sentence 5 is a general sentence that begins the paragraph. It introduces the name of the tribe 'Navajo', the year '1864' and details of the trek that the Navajo embarked on which includes the name of the place they trekked to. Sentences 5 and 4 form a mandatory pair. "This was a failure" in sentence 4 refers to "forced to embark on a trek for internment at Bosque Redondo" mentioned earlier in sentence 5. In the list of failures, sentence 4 (government failed to provide an adequate supply) comes first followed by sentence 1 (crop failure and disease were also endemic ..... raids ..... ) and this is followed by sentence 3 (**Furthermore**, enemies of the Navajo, had been relocated to the area resulting in conflicts). Sentence 2 concludes the topic. A treaty was negotiated between Navajo leaders and the Federal government allowing the surviving Navajo to return to their former homeland. Sentence (1) (were also endemic) has to precede sentence (3) (**Furthermore** ...). '**Furthermore**' is generally used to explain the last piece of information in supporting a viewpoint or closing an argument. Hence, 54132.

Ans: (54132)

#### Solutions for questions 29 to 31:

29. In choice A, the word 'underground' means exclusive privilege. So the inference from the paragraph would be that before the 20<sup>th</sup> century, music was underground but in the 20<sup>th</sup> century, music has become mainstream. Choice A has the wrong time periods mentioned. The correct time references should be "before the 20<sup>th</sup> century ..... " and "in the 20<sup>th</sup> century ..... " and not "in the 20th century ..... " and "after the 20th century ..... ". Choice A is incorrect as a summary.

Choice B aptly and concisely summarizes the content of the paragraph.

Choice C is incorrect as a summary. The paragraph does not talk about the quality or variety of 20th century music. It only highlights the fact that the reach and popularity of music has increased in the 20<sup>th</sup> century.

In choice D, the first sentence is out of scope. Hence it cannot be a summary.

Choice (B)

30. Choice A correctly and succinctly summarizes the main points of the paragraph.

In choice B the responsibilities of the male and female penguins are correctly mentioned. Also, choice B makes use of the word 'abandoned' which is inappropriate according to the information in the paragraph.

Choice C is incorrect as the male penguin leaves to bring food only two to three weeks after the eggs hatch. Also "The chick learns to become independent after 3 weeks of life" is not an accurate fact.

Choice D is incomplete as a summary. It also presents a complete distortion of facts. e.g. The chick is not left in a crèche with the male. The only correct summary is found in [A].

Choice (A)

31. The passage is about the origin of Taoism and what it advocates.

Choice A fails to mention that Taoism is of ancient Chinese origin. It also states that Taoism contradicts the established rules of the society, something that is not mentioned in the passage.

The paragraph states that Taoism is beyond organized religion and even beyond spirituality. Choice B which states that Taoism is a spiritual concept is incorrect. The rest of choice B is convoluted.

Choice C which calls Taoism an ancient Chinese philosophy is wrong. The last sentence of Choice C is out of scope.

Choice D aptly summarizes the paragraph. Choice (D)

#### Solutions for questions 32 to 34:

32. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It introduces *Campylobacter jejuni* as a serious problem and a cause of food poisoning. It can also be observed that sentences 1 and 4 are linked through the phrase "in the UK". Sentence 1 also introduces 700000 cases. "majority of cases in the UK" has been mentioned in sentence 4. Sentence 1 has the pronoun "it" which refers to *Campylobacter jejuni*. So sentence 5 is followed by sentence 1 which in turn is linked to sentence 4. Sentence 4 and sentence 2 form a mandatory pair. The demonstrative pronoun "this" in sentence 2 refers to the fact mentioned in sentence 4: contaminated chicken meat, which has not been cooked properly. So, 5142. Sentence 3 is the odd sentence out as it talks about treatment. This sentence can be mentioned as a part of a paragraph much later in the text. Also "as long as the diarrhoea lasts" in sentence 3 needs a precedent.

Ans: (3)

33. Sentence 3 is the topic sentence that opens the paragraph. It highlights the popularity of time travel. Sentence 3 is followed by sentence 1. "adventure-loving humans get in a vehicle and arrive in the past or future" in sentence 1 reiterates "popular topic for science fiction" in sentence 3. Sentence 5 then takes the discussion in another direction with "however". Reality is different from science fiction. So sentence 5 follows sentence 1. Sentence 2 concludes the paragraph by explaining the point made in sentence 5. "impossible" and "fatal" in sentence 2 paint a negative picture. Hence, 3152. Sentence 4 is the odd sentence out as it talks about time and not time travel.

Ans: (4)

34. On a careful reading of the sentences, it can be inferred that sentence 4 is a general sentence that begins the paragraph. It tells us what would happen to a cell without telomeres. Sentences 4 and 2 form a mandatory pair. "corrupt the cell's genetic blueprint" in sentence 4 links with "broken DNA is dangerous" and "chromosome damage" in sentence 2. So sentence 2 follows sentence 4. Sentence 2 also tells us that a cell senses and repairs chromosome damage. Sentence 2 is followed by sentence 5. "Because broken DNA is dangerous" and "cells repair chromosome damage" in sentence 2 is linked with "ends of chromosomes would look like broken DNA" and "cell would try to fix something that wasn't broken" in sentence 5. Sentence 1 follows as a logical consequence of the point mentioned in sentence 5. So, 4251. Sentence 3 is the odd

sentence out as it highlights another point: telomeres not shortening in tissues. The remaining sentences discuss what would happen to chromosomes and to a cell if telomeres were absent.

Ans: (3)

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

## SECTION – II

#### Solutions for questions 1 to 4:

From the graph, for the first few questions, we can see that wherever there is an increase in the number of marks, the question was answered correctly, wherever there is a decrease, the question was answered incorrectly and wherever there is no change, the question was not attempted. After five unattempted questions, we can differentiate between the questions answered incorrectly and the questions unattempted by comparing the slope. Questions for which the score decreased by a higher amount were the questions that were incorrectly answered whereas questions for which the score decreased by a lower amount were the unattempted questions.

- Question numbers 24, 25, 30, 31, 36 and 37, i.e., a total of 6 questions were not attempted by the student and attracted a penalty of 1 mark.  
Ans: (6)
- Final Score of the student =  $16 \times 4 + 13 \times -2 + 6 \times -1 = 32$   
Ans: (32)
- Questions 5, 22 and 33 satisfy the required conditions.  
Choice (A)
- After the evaluation of Question 7, marks =  $4 \times 4 + 3 \times -2 = 10$   
Required percentage =  $\frac{10}{28} \times 100 = 35.71\%$

Similarly, required percentage after the evaluation of Question 15 =  $\frac{18}{60} \times 100 = 30\%$

Required percentage after Question 22

$$= \frac{26}{88} \times 100 = 29.54\%$$

Required percentage after Question 33

$$= \frac{32}{132} \times 100 = 24.24\%$$

The percentage is the highest after the evaluation of question 7.

#### Alternative Solution:

The question can also be answered by simply considering the slopes of the line connecting the origin to each of the four points given in the choices. The required answer will be the point for which the slope is the maximum. By observation, the slope is the highest for Q.No. 7

Choice (A)

#### Solutions for questions 5 to 8:

- We can look at the ratio of ball possession to number of shots.  
For Liverpool = 54/19  
For Chelsea = 46/11  
For Manchester United = 42/17  
For Arsenal = 58/19  
By observing the ratios, we can see that this ratio is the lowest for Manchester United.  
Choice (B)

6. Required ratio for Liverpool =  $9/46 \approx 1/5$   
 For Chelsea =  $13/54 \approx 1/4$   
 For Manchester United =  $11/58 \approx 1/5$   
 For Arsenal =  $7/42 = 1/6$   
 By observation, we can see that Chelsea has the highest ratio.  
 Choice (D)
7. If no team scored consecutive goals, then both Chelsea and Manchester United could not have scored the first goal in their respective matches. From the option, only Chelsea could not have scored the first goal.  
 Choice (B)
8. The ratio required for the goal keeper of any team  
 $= (\text{Number of Shots on Goal by opponents} - \text{Number of Goals by opponents}) / \text{Number of Shots on Goal by opponents}$

The required ratio for the Goal keeper of Chelsea =  $(15 - 4)/15$ , which is slightly less than 75%  
 The required ratio for the Goal keeper of Liverpool =  $(9 - 3)/9$ , which is close to 67%  
 The required ratio for the Goal keeper of Arsenal =  $(11 - 2)/11$ , which is slightly more than 80%  
 The required ratio for the Goal keeper of Manchester United =  $(13 - 3)/13$ , which is slightly less than 80%.  
 Hence, the ratio is the highest for the Goal Keeper of Arsenal.  
 Choice (D)

#### Solutions for questions 9 to 12:

Let M, U and K represent the panel members. From the scatter chart, we can find the rating given by the members (but we cannot determine to which candidate the rating was given). Rewriting this information,

Mishra	1	1	4	5	6	7	7	8	8	9
Uday	2	2	3	4	4	6	6	7	9	9
Kumar	1	2	3	3	5	5	6	6	6	8

The cells in grey represent the ratings already assigned to candidates (from the table in the question).

A received a final score of 4. Hence, the sum of the ratings given by M, U and K combined must be  $4 \times 3 = 12$ . M and U combined must have given a rating of 6. M and U can give a combined rating of 6 only if M gave 4 and U gave 2.

For B, M and U together should have given 9. This is possible if M and U gave 5 and 4 OR 7 and 2 respectively. But U has given only two ratings of 2 – to J and A. Hence, M and U gave 5 and 4 respectively.

For C, M and K together must have given 14. Possibilities are 8 and 6 OR 9 and 5.

For E, G must have given 3. For F, the only possibility for M and K are 7 and 5. Now, for C, M and K cannot have given 9 and 5. Hence, they must have given 8 and 6.

For G, M and U must have given a total of 7. Hence, 1 and 6 is the only possibility.

For J, M and K must have given 1 and 6 respectively.

Since the only rating left for K is 2, K must have given that rating to H. M and U must have given 9 and 4 respectively.

Since Mishra has only rating left, he must have given 7 to I. U could have given 7 and 9 to either of I and D. If U gives 9 to D, the final score of the candidate will exceed 8. Hence, U gave 9 to I and 7 to D.

The final table of ratings is given below:

	A	B	C	D	E	F	G	H	I	J
Mishra	4	5	8	8	6	7	1	9	7	1
Uday	2	4	6	7	3	9	6	4	9	2
Kumar	6	1	6	8	3	5	5	2	3	6
Final Score	4	3.33	6.67	7.67	4	7	4	5	6.33	3

9. Uday gave a rating of 9 to I.  
 Ans: (9)
10. Three candidates – C, D and E – received the same rating from two members.  
 Ans: (3)
11. For A, B, E, G and J the rating given by any member was not greater than 7.  
 Ans: (5)
12. The highest final score received by a candidate was 7.67.  
 Choice (C)

#### Solutions for questions 13 to 16:

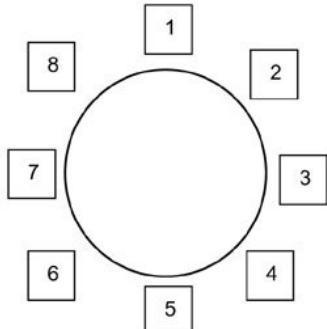
13. We can observe that for IT Directors the Median Salary of women will be the highest.  
 For Financial Managers, the median salary of women will be  $66000 \times (1 - 0.37) \Rightarrow 41500$   
 By observation, we can see that for none of the other occupations, the median salary of women will be above 41000.  
 Hence, the second highest median salary of women is for Financial Managers.  
 Choice (B)
14. The median salary of women is less than £25,000 for Civil Enforcement Occupations, Lab Technicians, Medical Technicians, Photographers, Receptionists, Science and Engineering Technicians, Security Guards, Taxi drivers and Chauffeurs and Vehicle Valets i.e., a total of 9 occupations.  
 Choice (B)

15. The occupations for which the Median Salary of women is less than £20,000 are Civil Enforcement Occupations, Lab Technicians, Photographers, Receptionists, Science and Engineering Technicians, Security Guards, Taxi drivers and Chauffeurs and Vehicle Valets. Among these occupations, the highest difference will be for either Lab Technicians or Science and Engineering Technicians.  
 Calculating the difference for both:  
 Lab Technicians:  $34\% \times 24094 = 8192$   
 Science and Engineering Technicians:  $32\% \times 29271 = 9367$   
 Hence, the answer is option D. Choice (D)

16. Let the median salary of Male Lawyers in 2014 be L  
 From the table, we can say that median salary of Female Lawyers in 2014 = 0.88L  
 Median Salary of Female Lawyers in 2015 =  $0.88L \times 1.1 = 0.968L$   
 Also, median salary of Male Lawyers in 2015 remained unchanged, i.e., L  
 Required Gender Pay Gap =  $0.968 - 1 = -3.2\%$   
 Choice (A)

#### Solutions for questions 17 to 20:

Let the diagram represent the seats around the table. From (i), Ashish is sitting to the left of Badri. Let Badri be sitting at 1. Ashish must have been sitting at 2.



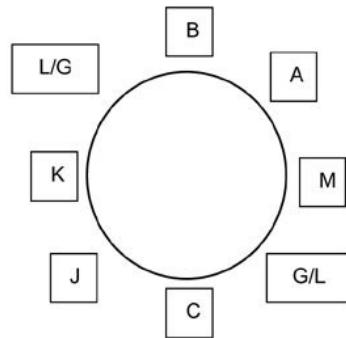
From (ii), Gautam and Lalit are sitting opposite each other. They could be sitting at 3 and 7 OR 4 and 8.

If they were sitting at 3 and 7, from (iii), the person sitting to the left of Joseph and Manish must have been opposite each other. This is only possible if the person to the left of Joseph and Manish are sitting at 4 and 8. But the person sitting to the left of Joseph cannot be at 4 or 8 (since it cannot be Joseph's left). Therefore, this case is not possible.

If they were sitting at 4 and 8, from (iii), the person sitting to the left of Joseph can be at 7, and Manish at 3. Joseph should be at 6.

From (iv), if Manish (person to the left of Ashish) and the person sitting to the left of Chetan exchanged places, Manish must be at 6. Therefore, Chetan must be at 5. Hence, Karthik must be at 7.

The following diagram represents the seating arrangement of the eight persons (first letter of the name represents the person):



17. Manish is sitting opposite Karthik.  
 Choice (B)
18. If Gautam is sitting adjacent to Manish, Karthik is sitting to the right of Lalit.  
 Choice (B)
19. Ashish and Manish are definitely sitting adjacent to each other.  
 Choice (D)
20. They could have been sitting around the table in 2 ways.  
 Ans: (2)

#### Solutions for questions 21 to 24:

From the first calculation we can see that 1 must be interchanged with either 0 or must not have been interchanged. If 1 was interchanged with a higher number i.e., 2 or 3, the output would have been greater than 200.

From the fourth calculation we can see that if 1 was interchanged with 0, the input would have been a sum of one two-digit number and one one-digit number, which can never be greater than  $99 + 9$ . Hence, **1 must not have been interchanged**.

From the second calculation, 9 could have been interchanged with 8 or it might not have been interchanged. If 9 was interchanged with 8, the third calculation would be  $8x + 9x$  (since 8 and 9 are interchanged) which must be around 180. But since the sum of these two was given as 128, 9 could not have been interchanged with 8. Hence, **9 must also not have been interchanged**.

In the fourth calculation, 1 and 9 were not interchanged. Therefore, the equation must be  $1xx + 19 = 192$ . 1xx must be 173. Therefore, **7 must not have been interchanged** and **8 must have been interchanged with 3**.

From the third calculation,  $9x + 3x = 128$  (where x can be any digit). 5 and 4 in the units place must add up to 8. This means that both 5 and 4 or any one of them must have been interchanged with 2 or 6 or 0. To get a sum of 8, the only possible way is to interchange both of them with 2 and 6. Therefore, 5 and 4 must have been interchanged with 2 and 6 in any order. This implies **0 was not interchanged**.

From the second equation, considering only the units place 2+3 must be 2. 3 is replaced with 8. This implies that **2 must be replaced with 4**. Hence, **5 must be replaced with 6**.

21. 7 was not interchanged in the calculator.  
 Choice (D)
22. 314 corresponds to an actual input of 812. 470 corresponds to an actual input of 270. Sum of the two = 1082.  
 Ans: (1082)

23. The output will be the same as the input for any number constituting the digits 0, 1, 7 and 9. From the options, the answer is 107, i.e., option D.  
Choice (D)
24. 123 corresponds to 148. 456 corresponds to 265. Therefore, the output of  $123+456$  will be 413. We can calculate only the units digit first and find that only option C and option D have units digit of 3.  
Option C:  $439 + 142 \Rightarrow 289 + 124 = 413$   
Option D:  $158 + 420 \Rightarrow 163 + 240 = 403$   
Hence, the answer is option C.  
Choice (C)

**Alternative Solution:**

Another approach to solving this set would be to pick one of the four calculations and work with it more methodically and comprehensively to list out all possible 'interchanges' (exactly three interchanges should be made in all) which will work for that calculation. These 'interchanges' that work then should be applied to one of the other three calculations to shorten the list of possibilities and so on, till a unique set of interchanges is obtained which satisfies all the four calculations.

On examining the given calculations, the third calculation ' $95 + 84 = 128$ ' would seem ideal to begin the trials with, since it has lesser number of distinct digits.

Since the last digit of the result is 8, the possibilities for the last digit of the inputs will be (0, 8), (1, 7), (2, 6), (3, 5) and also these pairs with the order of digits interchanged, i.e., (8, 0), (7, 1), (6, 2), (5, 3). The pairs (4, 4) and (9, 9) are not feasible.

Starting with the first possible pair for the last digits, the possible sets of interchanges are [5-0]&[4-8] i.e., the input may be  $x0 + 48$ , where  $x$  could be any digit, including 9 but excluding 5, 8, 4, 0.

OR

[5-8] & [4-0], i.e., the input may be  $x8 + 50$ , where  $x$  could be any digit, including 9 but excluding 5, 8, 4, 0.

Now, if we consider the set of interchanges [5-0] & [4-8], we get  $90 + 48 = 138$ . But the result actually obtained is 128, which means that another interchange of [9-8] is required. However, 8 is already interchanged with 4. Hence, the set of interchanges [5-0] & [4-8] is incorrect.

If we consider the set of interchanges [5-8] & [4-0], we get  $98 + 50 = 148$ . But the result actually obtained is 128, which means that another interchange of [9-7] is required. Thereby giving us a set of three interchanges [5-8] & [4-0] & [9-7]. This set of interchanges can now be checked against any one of the other calculations. Checking against the second calculation shows that this is not feasible, since the interchange [9-7] will yield a result more than 899 (approx.), whereas the result for the second calculation is given as 942. Hence, the set of interchanges [5-8] & [4-0] & [9-7] is incorrect.

Proceeding in this manner, we can check for the next possible pair of last digits, say (1, 7) and following the approach as above. We can see that we get two sets of interchanges [5-1] & [4-7] & [8-3] and [5-7] & [4-1] & [8-3] that satisfy the third calculation. Now checking these possibilities against the second calculation ' $912 + 43 = 942$ ', we see that both possibilities give results that are greater than 942. Hence, these possibilities are not correct.

Continuing with the next possible pair of last digits, (2, 6) and following the approach as above. We can see that we get two sets of interchanges [5-6] & [4-2] & [8-3] and [5-2] & [4-6] & [8-3] that satisfy the third calculation. Now checking these possibilities against the second calculation ' $912 + 43 = 942$ ', we see that only the set [5-6] & [4-2] & [8-3] gives the required result of 942. Further, we check this set of

interchanges against the other two calculations we can see that it satisfies them also.

Checking the last possible pair of last digits (3, 5) we do not get any set of three interchanges that satisfy even the third calculation.

Hence, only one possible set of interchanges exists, i.e., [5-6] & [4-2] & [8-3] and the digits, 0, 1, 7, 9 are left unchanged.

**Solutions for questions 25 to 28:**

Let a, b, c and d be the number of people travelling on the routes AB, AD, CB and ED respectively.

From (i),  $a + c = 2(b + d)$

From (ii),  $c = \frac{1}{4}(b + d)$

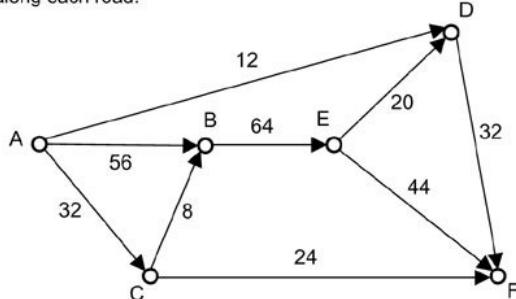
From (iii),  $a + c = 2 \times (100 - a - b)$

From (iv),  $a + c = 64$

$\Rightarrow b + d = 32 \Rightarrow c = 8 \Rightarrow a = 56$

From (iii),  $100 - a - b = 32 \Rightarrow a + b = 68 \Rightarrow b = 12$  and  $d = 20$ .

The following diagram shows the number of people that travelled along each road:



25. 32 people travelled through D. Ans: (32)

26. Number of people who travelled along ABEF lies between 36 and 44 (because 8 people joined B at C).

Number of people who travelled along ADF will be 12 (since the 12 people who travelled from A to D must have gone to F from D).

Similarly, the number of people who travelled along ACBEDF lies between 0 and 8.

The number of people who travelled along ACF will be 24. Hence, the maximum number of people travelled through ABEF.

Choice (A)

27. The highest number of people travelled on the road connecting Town E and Town F. Choice (A)

28. 32 people travelled on the road connecting town D and town F. Ans: (32)

**Solutions for questions 29 to 32:**

From (iii), after Karan purchased, Tarun had ₹2350 with him. Hence, the total amount paid by the customers after Karan paid for his purchase was ₹900. Given that Karan purchased two pen drives of the same capacity. He could not have purchased 32 GB or 64 GB pen drives. If he purchased two 8 GB pen drives, he would have spent ₹400. The person/s who visited before him must have spent ₹500. This is not possible for any combination of purchases. Hence, Karan could not have purchased two 8 GB pen drives. If Karan had purchased two 16 GB pen drives, the person/s who visited before him must have spent ₹200. This is possible only if one person visited before Karan and he purchased only one 8GB pen drive.

From (ii), only Amar and Naveen purchased one pen drive each. ∴ the rest purchased two pen drives each.

From (i), Tarun had ₹4300 when Amar left. Hence, Amar could not have been first. Therefore, Naveen was the first person to visit the store and Karan, the second.

From (iv), Pavan was the sixth person to visit the store.

Also, Lolly, Mithun and Amar must have visited the store 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> in any order. From (i), Lolly visited the store after Amar. Amar could have visited the store 3<sup>rd</sup> or 4<sup>th</sup>. If he visited the store 3<sup>rd</sup>, he must have spent ₹1950 on purchasing a single pen drive (since after the second person, Karan, left the store, Tarun had ₹2350 with him). This is not possible. Hence, Amar must have visited 4<sup>th</sup>, Lolly 5<sup>th</sup> and Mithun 3<sup>rd</sup>.

Since Amar and Lolly visited the store one after the other, Lolly must have spent ₹1450 on purchasing two pen drives. This is possible only if he purchased one 16GB and one 64GB pen drive.

From (iv), Pavan must have purchased one 8GB pen drive and one 32GB pen drive.

Mithun did not purchase a 32GB pen drive. Hence, he must have purchased an 8GB pen drive and a 64GB pen drive. Amar must have purchased a 32GB pen drive.

The following table presents the order in which each person visited the store, the pen drives that they purchased and the amount that Tarun had after each of them made their purchase:

Order	Person	Pen Drive	Amount with Tarun
1	Naveen	8GB	₹1650
2	Karan	16GB, 16GB	₹2350
3	Mithun	8GB, 64GB	₹3650
4	Amar	32GB	₹4300
5	Lolly	16GB, 64GB	₹5750
6	Pavan	8GB, 32GB	₹6600

29. Karan purchased two 16GB pen drives i.e., a total capacity of 32GB.  
Choice (B)
30. Lolly spent the maximum amount (₹1450) on purchasing the pen drives.  
Choice (D)
31. Amar purchased a 32GB pen drive.  
Choice (C)
32. The average amount spent by each person  

$$= \frac{(6600 - 1450)}{6} = 858.33$$
  
Choice (C)

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

### SECTION – III

#### Solutions for questions 1 to 34:

1. Let Amar have  $n$  chocolates and Akbar have  $m$  biscuits. Given that  $m = 2n$ .

$$\text{Also, price of one chocolate} = \frac{20}{n}$$

$$\text{Price of one biscuit} = \frac{30}{m}$$

Ratio of the price of a chocolate to that of a biscuit

$$= \frac{20}{n} : \frac{30}{m} = \frac{20}{n} : \frac{30}{2n} = 4 : 3$$

Choice (C)

2. Let the cost price of a pen be  $c$ .  
The selling price of the pen will be  $1.2c$ .

The selling price of a pack of pens will be  $1.2c \times 20 \times 0.9$ .  
The total amount that Tarun would have paid will be  $(1.2c \times 20 \times 0.9 \times 2) + (5 \times 1.2c)$

$$\therefore (1.2c \times 20 \times 0.9 \times 2) + (5 \times 1.2c) = 492$$

$$\Rightarrow 49.2c = 492 \Rightarrow c = 10.$$

Hence, the cost price of a single pen will be ₹10.

Ans: (10)

3. 84 can be written as a product of two numbers in the following ways: (1, 84); (2, 42); (3, 28); (4, 21); (6, 14); and (7, 12).

Among these combinations, only for (3, 28) and (7, 12) will the sum of the factors be a prime number. Hence,  $a + b$  can assume two values: 31 and 19.

Ans: (2)

4. When a loan is recovered in  $n$  equal yearly instalments, then the instalment amount is set to ensure that the sum of the principal and the interest earned on it for  $n$  years is equal to the sum of the instalments and the respective interests earned on them over the rest of the repayment period.

Let each instalment be ₹ $x$ .

The future value of 10000 at the end of 5 years

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

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

$$\Rightarrow 15000 = \left( x + 4x \times \frac{10}{100} \right) + \left( x + 3x \times \frac{10}{100} \right) + \left( x + 2x \times \frac{10}{100} \right) + \left( x + x \times \frac{10}{100} \right) + x$$

Solving, we get  $x = 2500$ .

Ans: (2500)

5. The quadratic equation whose roots are reciprocals of the roots of  $ax^2 + bx + c = 0$  is obtained by substituting  $\frac{1}{x}$  in place of  $x$  (or by simply interchanging 'a' and 'c'). Thus the required equation is  $3\left(\frac{1}{x}\right)^2 + 4\left(\frac{1}{x}\right) + 2 = 0$   
i.e.  $3x^2 + 4x + 2 = 0$ .  
Choice (A)

#### Alternative Solution:

The product of the roots of  $3x^2 + 4x + 2 = 0$  is  $\frac{2}{3}$ .

The product of the reciprocals of the roots will be  $\frac{3}{2}$ .

Sum of the roots of  $3x^2 + 4x + 2 = 0$  is  $\frac{-4}{3}$ .

If  $a, b$  are the roots, then sum of the reciprocals of the roots will be  $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab}$

Hence, sum of the reciprocals of the roots

$$= \frac{\frac{3}{2}}{\frac{2}{3}} = -\frac{4}{2} = -2$$

The only equation that satisfies both these conditions is the equation given in option A.

Hence, the required equation is  $2x^2 + 4x + 3 = 0$ .

6. When the product of two or more positive quantities is constant, then the sum of all the quantities will be the least when they are all equal to each other.

Now, if  $x^2 \cdot y^4 = 1024$ ,  
then  $(x)(x)(x)(x)(x)(y)(y)(y)(y) = 1024$ ,

$[(x + x + x + x + x) + (y + y + y + y)]$  will be the least when all the ten quantities (i.e. 6x's and 4y's) are equal, to say 'k'.  
Hence  $k^{10} = 1024 = 2^{10}$   
 $\Rightarrow k = 2$   
 $\therefore$  minimum value of  $6x + 4y = 10k = 20$ .  
Hence, the minimum value of  $12x + 8y = 20k = 40$   
 $[\because 12x + 8y = 2(6x + 4y)]$ . Ans: (40)

#### Alternative Solution:

Given  $x^6y^4 = 1024$ . If  $x^m y^n$  is a constant, the minimum value of  $ax + by$  is realized when  $\frac{ax}{m} = \frac{by}{n}$   
i.e., when  $\frac{12x}{6} = \frac{8y}{4} \Rightarrow x = y$   
Hence,  $x = y = 2$ .  
The minimum value of  $12x + 8y = 20 \times 2 = 40$

7. The series  $-1 + \frac{1}{2 \times 3} + \frac{5}{4 \times 9} + \frac{19}{8 \times 27} + \frac{65}{16 \times 81} \dots$

can be written as

$$\begin{aligned} & 2 - 3 + 1 - 1 + \frac{1}{2} - \frac{1}{3} + \frac{1}{4} - \frac{1}{9} + \frac{1}{8} - \frac{1}{27} \dots \\ &= \left(2 + 1 + \frac{1}{2} + \frac{1}{4} + \dots\right) - \left(3 + 1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots\right) \\ &= \frac{2}{1 - \frac{1}{2}} - \frac{3}{1 - \frac{1}{3}} = 4 - \frac{9}{2} = -\frac{1}{2} \end{aligned}$$

Choice (C)

#### Alternative Solution:

Such questions can sometimes be approached by calculating the individual terms and finding the approximate sum of the series to the first few terms.  
The sum of given series =  $-1 + 0.1667 + 0.1389 + 0.0879 + 0.0502 \dots \equiv -1 + 0.4437 + \dots$   
Since the successive terms have a decreasing ratio, indicating that the series will converge quickly and a safe approximation for the sum would be  $(-1 + 0.5) \equiv -\frac{1}{2}$ .

Now, by observing the choices (A), (B) and (D) can be eliminated and choice (C) is best answer.

8. Let a and d be the first term and common difference of the A.P.

Average of first five terms is the third term.

$$\Rightarrow a + 2d = 4 \quad (1)$$

Average of the first ten terms = average of 5<sup>th</sup> and 6<sup>th</sup> terms, i.e.,  $a + 4.5d$

$$\Rightarrow a + 4.5d = 9 \quad (2)$$

Solving (1) and (2),  $a = 0$  and  $d = 2$ .

Therefore, 15<sup>th</sup> term =  $0 + 14 \times 2 = 28$ .

Ans: (28)

9. Any number with two distinct digits will be of the form aabb or abab or abba or aaab or abaa or aaba or baaa

#### Case I

If aabb or abab or abba is to be divisible by 9, then  $2a + 2b$  must be either 9 or 18 or 27 or 36.

$2a + 2b$  cannot be 9 or 27 because it must be even.

Hence, if  $2a + 2b = 18$ , then (a, b) can be (1, 8), (2, 7), (3, 6), (4, 5), (9, 0).

For each possibility of (a, b) except (9, 0), there will be 6 numbers possible.

For (9, 0) there will be three possible numbers.

Hence, there are a total of  $4 \times 6 + 3 = 27$  possibilities.

If  $2a + 2b = 36$ , then  $a + b = 18$ . This is only possible if  $a = b = 9$ . Since this does not have two distinct digits, there are no possibilities.

#### Case II

If aaab or abaa or aaba or baaa is to be divisible by 9, then  $3a + b$  can be 9 or 18 or 27 or 36.

If  $3a + b = 9$ , then (a, b) can be (0, 9), (1, 6), (2, 3), (3, 0).

If  $3a + b = 18$ , then (a, b) can be (3, 9), (4, 6), (5, 3), (6, 0).

If  $3a + b = 27$ , then (a, b) can be (6, 9), (7, 6), (8, 3), (9, 0).

If  $3a + b = 36$ , then (a, b) can be (9, 9) (not possible).

For each value of (a, b) except for (0, 9), (6, 0), (9, 0), (3, 0), there will be four possible numbers.

For (0, 9) only one value is possible (9000).

For (6, 0), three values are possible.

For (9, 0), three values are possible.

For (3, 0), three values are possible.

Hence, the total number of possibilities are  $8 \times 4 + 10 = 42$

Total possible numbers =  $42 + 27 = 69$ . Choice (C)

10. Given  $g(x) = 2 + \frac{1}{f(x)}$ .

If  $g(x)$  is to be maximum,  $f(x)$  must be minimum.

$f(x) = 13 + |x-16|$  will be minimum when  $|x-16|$  is zero.

Hence, the minimum value of  $f(x)$  will be 13.

The maximum value of  $g(x) = 2 + \frac{1}{13} = \frac{27}{13}$

Choice (B)

11. The time taken to meet for the first time =

$$LCM\left(\frac{0.5}{8-5}, \frac{0.5}{15-5}\right) = LCM\left(\frac{1}{6}, \frac{1}{20}\right) = \frac{1}{2} \text{ hours}$$

= 30 minutes Choice (B)

12. Let one man do  $m$  units of work in a day and one woman do  $w$  units of work in a day.

$$\text{Total work} = 10(4m + 3w) = 12(5m)$$

$$\Rightarrow 2m = 3w$$

Total work = 60 m.

Now 30 m is done by 8 men and then the remaining 30 m is done by 8 men and 2 women

$$\begin{aligned} \text{Time taken to complete the work} &= \frac{30m}{8m} + \frac{30m}{8m+4m} \\ &= \frac{15}{4} + \frac{45}{14} = \frac{195}{28} \text{ days} \end{aligned}$$

Choice (D)

13. Let the a, b, c be  $5x$ ,  $6x$ , and  $13x$  respectively.

$$\text{Given } 2a + 5b = 10 \Rightarrow 40x = 10 \Rightarrow x = \frac{1}{4}$$

$$\Rightarrow a + b + c = 24x = 6.$$

Choice (D)

$$14. \sqrt{19} + \sqrt{14} = \sqrt{a + b}$$

Squaring on both sides,

$$19 + 14 + 2\sqrt{19 \times 14} = a + b$$

$$33 + \sqrt{1064} = a + b$$

$$\text{Hence, } a + b = 1064 + 33 = 1097.$$

Ans: (1097)

15. The ten students combined must have scored  $4.4 \times 10 = 44$  marks in the test.

After removing the question, the total marks scored by the ten students would have been  $3.8 \times 10 = 38$ .

$\therefore$  The total score of the students is reduced by 6 marks. Hence, 6 students must have been awarded marks for the question that was removed and 4 students must not have been awarded any marks for that question.

Ans: (4)

16. The largest number which leaves remainders of 4, 6 and 2 when it divides 460, 690 and 990 respectively will be HCF (460-4, 690-6, 990-2)

$$= \text{HCF}(456, 684, 988) = \text{HCF}(684 - 456, 988 - 684)$$

$$= \text{HCF}(228, 304) = 76.$$

$$\text{Hence, the required number} = 76.$$

Ans: (76)

17. Let the product of the three consecutive natural numbers be  $P$ .

$$\text{Now, } n = \frac{P}{153}.$$

For  $n$  to be minimum, we consider the least possible value of  $P$ , which is  $P = 1 \times 2 \times 3 = 6$ .

$$\Rightarrow \text{minimum possible value of } n = \frac{6}{153} = \frac{2}{51}.$$

Choice (D)

18.  $(232)_6 = (2 \times 6^2) + (3 \times 6) + (2) = 92$

$(120)_4 = (1 \times 4^2) + (2 \times 4) + (0) = 24$

Remainder when 92 is divided by 24 is 20.

From the options,  $(26)_7 = (2 \times 7) + (6) = 20$  is the answer.  
Choice (B)

19. Let  $5x$  and  $6x$  be the number of blue balls and red balls present in the bag initially.

When two red balls are taken out,

$$\frac{5x}{6x - 2} = \frac{10}{11} \Rightarrow 55x = 60x - 20 \Rightarrow x = 4$$

Hence, the number of balls initially in the bag =  $11 \times 4 = 44$

Ans: (44)

20. Let the cost of a pencil be  $p$  and the cost of an eraser be  $e$ .

$$3p + 6e = 24$$

$$p = 1.2e$$

$$\text{Hence, } 3.6e + 6e = 24 \Rightarrow e = 2.5$$

$$p = 3.$$

Choice (B)

21. The ratio in which Tarun, Raghu and Umesh share the profits =  $15000 \times 12 : 18000 \times 5 : 12000 \times 8$

$$= 30 : 15 : 16$$

Choice (D)

22. Income from January to October =  $23000 \times 10 = 230000$

Total income for the year =  $25000 \times 12 = 300000$

Income in the remaining two months =  $300000 - 230000$

= 70000

$$\text{Average income per month} = \frac{70000}{2} = 35000$$

Ans: (35000)

23. Using the rule of alligations,

$$\begin{array}{ccc} \frac{9}{13} & & \frac{3}{10} \\ & \searrow & \swarrow \\ & \frac{10}{21} & \\ & \downarrow & \\ \frac{10}{21} - \frac{3}{10} & = & \frac{37}{210} & \quad \frac{9}{13} - \frac{10}{21} & = & \frac{59}{273} \end{array}$$

$$\text{Required ratio} = \frac{37}{210} : \frac{59}{273} = 481 : 590$$

Choice (D)

24.  $x = \frac{1}{\left(4 - \left(\frac{1}{4+x}\right)\right)} \Rightarrow x = \frac{1}{4 - \left(\frac{1}{4+x}\right)}$

$$4 - \left(4 + \frac{1}{4 - \left(\frac{1}{4+\dots}\right)}\right)$$

$$x = \frac{4+x}{(16+4x-1)} \Rightarrow 15x + 4x^2 = 4 + x$$

$$\Rightarrow 4x^2 + 14x - 4 = 0$$

$$\Rightarrow 2x^2 + 7x - 2 = 0$$

$$\therefore x = \frac{-7 \pm \sqrt{49 + 16}}{4} = \frac{-7 \pm \sqrt{65}}{4}$$

$$\text{As } x \text{ cannot be a negative quantity, } x = \frac{\sqrt{65} - 7}{4}$$

Choice (A)

Alternative Solution:

The given fraction can be written as  $x = \frac{1}{4 - (B)}$ , where

$$B = \frac{1}{4+x}. \text{ Now, as } 4+x > 4, \text{ (because } x \text{ is positive), } B$$

$$< 0.25 \text{ and hence } x = \frac{1}{4-B} \text{ will be less than } \frac{1}{3.75}$$

(i.e., 0.2667) but greater than  $\frac{1}{4}$  (i.e., 0.25). Now, as 0.25

<  $x$  < 0.2667 using the onscreen calculator we can check for each of the given options. Clearly, choices (B) and (D) are negative and choice (C)  $\equiv 0.292$ . Hence, only choice (A) satisfies.

25.  $\frac{4 \log m}{2 \log n} + \frac{3 \log mn}{2 \log n} = \frac{\log m^4 m^3 n^3}{\log n^2} = \log_{n^2} m^7 n^3 = 2$

$$\text{Hence, } n^{2^2} = m^7 n^3 \Rightarrow n = m^7$$

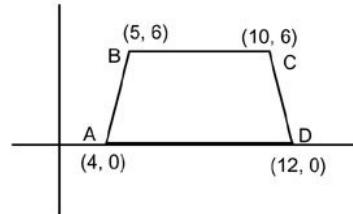
Ans: (7)

26.  $(4 \Psi 5) = \frac{4}{24} = \frac{1}{6}$

$$\left(3 \Psi \frac{1}{6}\right) = \frac{3}{\frac{1}{6}-1} = -\frac{3}{35} \times 36 = \frac{-108}{35}$$

Choice (A)

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



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

Hence, the area of the trapezium

$$= \frac{1}{2} \times 13 \times 6 = 39 \text{ sq.units.}$$

Choice (A)

28. Prime numbers less than 30 are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.

$y$  can be a maximum of 29. Hence,  $x$  has to be greater than 17.

If  $x$  is 19,  $y$  can be 29. (1 possibility)

If  $x$  is 23,  $y$  can be 11, 13, 17, 19 and 29. (5 possibilities)

If  $x$  is 29,  $y$  can be any prime number less than 30 except 29. (9 possibilities)

Total number of possibilities = 15.

Ans: (15)

29. Let the distance that Ramu walks be  $d$ .

The time taken to reach home when Ramu walks at 4 kmph

$$= \frac{d}{4} \times 60 \text{ minutes} = 15d \text{ minutes}$$

Time taken by Ramu to reach home when he walks at 5 kmph =  $12d$  minutes

$$\text{Given } 15d - 12d = 15 \Rightarrow d = 5$$

Hence, Ramu starts at 3:45 PM from the school.

Choice (B)

**Alternative Solution:**

When Ramu's speed becomes  $\frac{5}{4}$  times, his time will

become  $\frac{4}{5}$ th of his initial time taken for the journey, i.e.,

he will save  $\frac{1}{5}$ th of his initial time. This saving in time is

clearly 15 minutes (from the given information). Hence, his initial time taken =  $5 \times 15$  minutes. Hence, his starting time from school = 5.00 pm - 75 min = 3:45 pm.

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

31. Volume of the cube =  $22^3$  cm<sup>3</sup>

$$\text{Volume of the sphere} = \frac{4}{3}\pi r^3 = 22^3 \Rightarrow r^3 = 2541$$

$$\text{Hence, } r = \sqrt[3]{2541}$$

Choice (A)

32. The last digits of powers of 8 are 8, 4, 2, 6...i.e., a period of 4.

The last digits of powers of 3 are 3, 9, 7, 1...i.e., a period of 4.

The last digit of  $258^{35}$  will be 2 ( $\because 35 = 4k + 3$ )

The last digit of  $393^{58}$  will be 9 ( $\because 58 = 4k + 2$ )

Hence, the last digit of  $258^{35} + 393^{58}$  will be 1.

Ans: (1)

33. The diameter of the circumcircle will be the hypotenuse of the triangle.

Hypotenuse = 13 cm

Area of the circumcircle =  $\pi \times 169/4 = 42.25\pi$  sq.cm.

Choice (A)

34. Let the initial price of the stock be  $x$ .

The final price of the stock =  $x(1.3)(0.8) = 1.04x$

Hence, Karthik's gain would have been 4%.

Choice (B)

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