

## (Key and Solutions for AIMCAT1807)

**Key****SECTION – I**

1. 42153	8. 1	15. A	22. C	29. A
2. 4	9. 2	16. B	23. A	30. 2
3. D	10. 52431	17. 4	24. C	31. 5
4. B	11. B	18. 1	25. 14253	32. B
5. B	12. C	19. B	26. 3	33. C
6. D	13. A	20. D	27. D	34. D
7. C	14. D	21. C	28. B	

**SECTION – II**

1. 1800	8. 6	15. A	22. D	29. B
2. A	9. 47	16. C	23. C	30. C
3. D	10. A	17. A	24. D	31. D
4. B	11. C	18. B	25. 58	32. A
5. 6	12. B	19. C	26. 20	
6. D	13. 87	20. D	27. 53	
7. B	14. B	21. C	28. 26	

**SECTION – III**

1. 6	8. 12	15. C	22. B	29. B
2. D	9. B	16. A	23. 4	30. -11
3. C	10. 1.618	17. C	24. A	31. C
4. D	11. D	18. 11100	25. 50	32. D
5. C	12. B	19. B	26. D	33. C
6. A	13. C	20. 10	27. C	34. 2
7. A	14. B	21. B	28. D	

**Solutions****SECTION – I****Solutions for question 1:**

1. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the para. It has the background: Imagine a television ..... handful of channels. Sentences 4 and 2 form a mandatory pair. "as in the old days, has only a handful of channels" in sentence 4 links with "once again have only a few channels" in sentence 2. "but each will run miles deep ...." in sentence 2 contrasts "hundreds (of channels), as a typical cable set-up might offer today." Sentence 2 is followed by sentence 1. "might be such offering(s)" in sentence 1 exemplify the point made in sentence 2. Sentence 1 is followed by sentence 5. "Both firms" in sentence 5 refer to Netflix and Amazon given in sentence 1. Also "making and buying TV shows to sell directly to viewers to watch when they like" in sentence 5 is parallel to "with content that can be viewed on demand" given earlier in sentence 2. So, 4215. Sentence 3 follows sentence 5. "them" in sentence 3 points to Netflix and Amazon. Hence 42153.  
Ans: (42153)

**Solutions for question 2:**

2. In part 1, "far little an attention" is incorrect. The article 'an' is not required. The part should read: It has received far less attention than Auschwitz ...

In part 2, "covered" is incorrectly used. We need the phrasal verb "covered up" (What happened there was covered up).

In part 3, "Allies" needs to be preceded with the definite article 'the'.

Part 4 is error-free.

Part 5 has errors of punctuation. Commas are needed at various places. Part 5 should read: Towards the end of the war, as other camps emptied, it became the engine of the Nazi killing machine on the orders of Heinrich Himmler.

Ans: (4)

**Solutions for questions 3 to 8:****Number of words and Explanatory notes for RC:**

Number of words: 779

3. Doves and hawks can reasonably be expected to differ on the exact nature of the evil practices, real or imagined, of current enemies of the state, but the debates will go on within a quite expectable narrow set of patriotic premises. Both speak of the nation as the active agent in international affairs, not specific groups within it. Both tend to argue that the "national interests" as articulated reflect such common interests as might be generally shared within society. This makes choice D the correct answer.  
Choice (D)

4. Option A: The United States has a long history of critical intellectuals, but Chomsky does not quite fit into any American tradition of protest. He is not part of that long line of critics ... But choice A says 'any intellectual school' and that cannot be inferred from the passage.  
 Option B: He suggests that a reasonable way to understand the foreign policy of any state begins by studying the domestic social structure. Hence choice B is correct.  
 Option C: Chomsky's analysis of America's most popular and omnipresent self-images is thorough and devastating. His careful scrutiny reveals them to be neither accurate nor rational. Rather, they are part of an ideological ethos whose function is comparable with what all great powers require: an ideological rationale for their wealth and power." Hence choice C is incorrect.  
 Option D: Debates about Vietnam between hawks and doves might heatedly dispute whether the war was a costly mistake, an error or even a great tragedy. But responsible debate simply excludes from serious consideration that the war was wrong in principle or an act of aggression. Hence choice D is incorrect.  
 Choice (B)
5. Option A: The first sentence of para 1 is: The United States has a long history of critical intellectuals, but Chomsky does not quite fit into any American tradition of protest. The second sentence of para 2 is: He is not part of that long line of critics .... These two sentences need to run continuously. If the sentence given in the question is inserted here, then it will disrupt the thought flow. Choice A is not the correct answer.  
 Option B: Para 7 has the following sentences at the end: *Thus Chomsky compares South Vietnam and Afghanistan to show how little difficulty US observers have in spotting a Russian invasion of a country. If a puppet regime in Kabul requests Soviet military aid, there is no question that aggression is taking place. But when a puppet regime in South Vietnam requests US military aid, no aggression or invasion is even at issue.* Hence the sentence given in the question: "Quite the contrary" fits in at the end of para 7. It resonates with the author's viewpoint given earlier: But responsible debate simply excludes from serious consideration that the war was wrong in principle or an act of aggression. Like George Orwell, Chomsky has an uncanny ability to suggest the ideological message in all its blatancy just beneath the apparently objective facade of argument. Hence choice B is the answer.  
 Option C: The fourth para ends with: Quite understandably, such people will not see themselves as a caste of propagandists or as indoctrinators. They prefer to think of themselves as educators, religious leaders, often as fervent apostles of truth which place them in conflict with the state. We cannot insert "Quite the contrary" here as it would be redundant. So choice C is not the answer.  
 Option D: The end of para 3 does not present any contrary view. Who sets foreign policy? What interests do they represent? On what is their domestic power based? The policy that evolves can reasonably be expected to reflect the specific interests of those who shape it. Choice D would be a wrong place for the sentence given in quotes in the question.  
 Choice (B)
6. Statement (a): Refer to para 3. Who sets foreign policy? What interests do they represent? On what is their domestic power based? The policy that evolves can reasonably be expected to reflect the specific interests of those who shape it. Hence statement (a) is true and is not the answer.  
 Statement (b): The United States is not exempt from what is so reasonably expected from others. Chomsky expects to find great powers cloaking their aggressive self-interested quests in clouds of inspiring rhetoric, while all along a chorus of its supporters insist that it uniquely exempt from the aggressive pursuits so easily depicted in its enemies. So statement (b) is correct but it is not the answer.

Statement (c): Refer to para 1. They manifest an adamant refusal to see that the United States secretes its own way of seeing the world, shaped to the needs of quite specific, powerful interests. Lamentations about "American innocence" fit snugly with ruthless pursuit of self-interest by powerful institutions and individuals throughout US history. Hence statement (c) is also correct and it is not the answer.  
 Statement (d): Thus Chomsky compares South Vietnam and Afghanistan to show how little difficulty US observers have in spotting a Russian invasion of a country. If a puppet regime in Kabul requests Soviet military aid, there is no question that aggression is taking place. But when a puppet regime in South Vietnam requests US military aid, no aggression or invasion is even at issue. Statement (d) is the reverse of his opinion. The last para shows that the US does precisely what it accuses Russia of doing but uses euphemisms to describe its own actions. Hence (d) is not true and is the answer.

Statement (e): Ferocious debates are not indications that consensus values are questioned. Doves and hawks can reasonably be expected to differ on the exact nature of the evil practices, real or imagined, of current enemies of the state, but the debates will go on within a **quite expectable narrow set of patriotic premises**. Both speak of the nation as the active agent in international affairs, not specific groups within it. Both tend to argue that the "national interests" as articulated reflect such common interests as might be generally shared within society. Hence statement (e) is also correct and is not the answer.  
 Choice (D)

7. Refer to para 3. A rational approach will begin ...  
 Option A: No American dream is part of his beliefs. He is not part of that long line of critics who bemoaned America's betrayal of its promise. Choice A is true but is not the reason that the author considers Chomsky to be rational.  
 Option B: Choice B is also true but this is not the reason the author considers Chomsky to be rational.  
 Option C: The United States is not exempt from what is so reasonably expected from others. A rational approach will begin by looking for what is reasonable to expect of all nations. Chomsky expects to find great powers cloaking their aggressive self-interested quests in clouds of inspiring rhetoric, while all along a chorus of its supporters insist that it uniquely exempt from the aggressive pursuits so easily depicted in its enemies. Hence choice C is the correct answer.  
 Option D: Choice D has been mentioned in para 1. Nor does he accept a vision of America as a well-intentioned, morally inclined power whose ideals embody the best aspirations of mankind. But choice D is not specific to the question.  
 Choice (C)
8. Statement 1: Refer to para 5 where it's indicated that 'shared consensus' is that which is not debated in the ideology the state espouses. "..... Yet to see just what the shared consensus is in a society, Chomsky suggests, look at what the "influential critics" do not challenge. There the extent to which they are submissive and obedient to the state can be expected to reveal itself." Hence statement 1 is correct. The remaining statements do not apply.

Ans: (1)

#### Solutions for question 9:

9. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the para. It introduces Zcash and has the background: ... newest crypto-currency. Sentence 3 is followed by sentence 1. "crypto-currency" in sentence 3 links with "a bunch of cryptography researchers" in sentence 1. Also, "It is based on Bitcoin's code" in sentence 3 contrasts "its creators, a bunch of cryptography researchers, have tweaked it" in sentence 1. Sentence 1 is followed by sentence 4. "tweaked it" in sentence 1 links with "minted more quickly and can handle more transactions" in sentence 4. Also "new digital cash" in sentence 4 is parallel to "newest

"crypto-currency" given earlier in sentence 3. Sentence 5 is the result or consequence of the point mentioned in sentence 4. Sentence 5 concludes the para. So, 3145. Sentence 2 is the odd sentence out. It talks about "competition between currencies" while the given para focuses on zcash. Sentence 2 can be the introductory sentence of another para.

Ans: (2)

#### Solutions for question 10:

10. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It introduces the topic of discussion: Parkinson's disease. Sentence 5 is followed by sentence 2: "Researchers do not really understand ...." in sentence 5 is linked with "Nor do they understand .... nor even" in sentence 2. The pronoun 'they' in sentence 2 refers to "researchers" in sentence 5. Sentence 2 is followed by sentence 4. "Those researchers" in sentence 4 points to "they" in sentence 2. "might understand better, though," in sentence 4 contrasts "Nor do they understand ...." in sentence 2. So 524. Sentence 4 is followed by sentence 3. "if they were able to track the day to day symptoms of people" in sentence 4 links with "Smartphones .... offer a way to do so" in sentence 3. Sentence 3 is followed by sentence 1. "They" in sentence 1 points to "smartphones, and other mobile devices" in sentence 3. Also "they are packed with sensors, particularly accelerometers and GPS tracking devices" in sentence 1 links with "track the day to day symptoms of large numbers of people who suffer from Parkinson's" given earlier in sentence 4. Sentence 1 concludes the para.

Ans: (52431)

#### Solutions for questions 11 to 16:

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

Number of words: 611

11. Option A: The "Gaia" theory, which is the subject of the opening chapters, starts with the surprising observation that such things as the Earth's surface temperature and the salinity of its oceans have fluctuated remarkably little over billions of years despite, for instance, a significant increase in the power of the sun. James Lovelock, who first proposed the Gaia theory, used an analogy with living organisms, all of which can, to some degree, regulate conditions within their own bodies. Hence choice A is correct and is not the answer.

Option B: James Lovelock, who first proposed the Gaia theory, used an analogy with living organisms, all of which can, to some degree, regulate conditions within their own bodies. The theory brings to mind New Age crankery, and **some of the research Mr Flannery cites to underpin it is speculative at best**. For example, he mentions a scientific paper that suggests that lichens, bacteria and the like may have been a driving force behind prehistoric geology and the formation of continents. Mr Flannery admits that the idea is "controversial". But having shown the reader a glimpse of this fascinating byway, he speeds straight past, impatient to reach the next intellectual stop, **while the tentative theory is simply accepted**. Hence choice B is inconsistent with the information given in the passage. Choice B is the answer.

Option C: The "Gaia" theory is the subject of the opening chapters of the book. Hence choice C is true and is not the answer.

Option D: There is an effort to organise the chapters around two competing models of human behaviour, a co-operative, far-sighted wisdom that Mr Flannery dubs the "Gaian" approach. .... Hence choice D is true and is not the answer.

Choice (B)

12. Para 4 begins with the words in quote and 'that' refers to what has been said at the end of para 3. What is shown is Tim Flannery's failure to go deep into things he has merely touched upon. The book feels dilettantish, with a dizzying

array of concepts introduced, briefly discussed, then dispensed with before the reader has had time to digest them. Hence choice C is the answer.

Option A: While the word 'reluctance' draws attention thanks to the phrase 'impatient to reach the next intellectual stop' given in the penultimate para, the author of this passage is more concerned about the inadequacies in the book, rather than the inadequacies in attitude. This means that choice C is a better choice than A.

Options B & D: Choices B & D are not specific or relevant to the context.

Choice (C)

13. (a): "Here on Earth" a twin biography, of humanity and the planet it inhabits, but that description is inadequate. Mr Flannery's subject is the likely fate of humankind, and whether the powers granted to modern civilisation by science and technology will prove to be its downfall or its salvation. Hence (a) is true and is not the answer.  
(b): (b) is negated by the first para. His earlier book "The Weather Makers" was a best seller. (His 2005 book, "The Weather Makers", about climate science and global warming, was a bestseller.)  
(c): The question of whether modern democracies can successfully resist populist tyranny is raised and then abandoned within two paragraphs. A discussion of decarbonising the world's transport networks flashes by .... Hence (c) is correct and is not the answer.  
(d): (d) is true from the last sentence of para 2. There is an effort to organise the chapters around two **competing** models of human behaviour ....  
(e): Statement (e) cannot be inferred from the passage. In fact, by telling us that he easily accepts certain hypotheses, the passage indicates that he's quite willing, in some instances, to take a side.

So (b) and (e) are not true.

Choice (A)

14. Statement (a): Mr Flannery is a respected biologist with plenty of published papers to his name (para 3, second sentence). He is also a mammalogist. Tim Flannery is a paleontologist (para 1, first sentence). Hence statement (a) is true and is not the answer.  
Statement (b): The book feels dilettantish, with a dizzying array of concepts introduced, briefly discussed, then dispensed with before the reader has had time to digest them. .... Fewer examples more deeply explored might have added up to a more convincing case, and an easier read. .... Having shown the reader a glimpse of this fascinating byway, he speeds straight past, impatient to reach the next intellectual stop, while the tentative theory is simply accepted. But statement (b) would be correct if it said 'cursory' or 'superficial'. 'Rambling' would be more in the nature of 'directionless'. But he's not really directionless, it's just that he doesn't stop long enough at points that need further examination. **So, as it is,** (b) is not true and is the answer.  
Statement (c): Statement (c) is supported by the last sentence of para 1. Mr Flannery's subject is the likely fate of humankind, and whether the powers granted to modern civilisation by science and technology will prove to be its downfall or its salvation. So statement (c) is true and is not the answer.  
Statement (d): There is an effort to organise the chapters around two competing models of human behaviour, a co-operative, far-sighted wisdom that Mr Flannery dubs the "Gaian" approach and a reckless, ultimately destructive short-termism that he calls "Medean", after the bloodthirsty enchantress of Greek myth. But Statement (d) (unsure about the validity of the Gaian and Medean approaches) cannot be inferred from the passage.  
So statements (b) and (d) are not true and are the answers.

Choice (D)

15. Option A: Refer to the third para and the first two lines of para 4. Choice A can be inferred. Refer also to the last sentence of para 4. But having shown the reader a glimpse of this fascinating byway, he speeds straight past, impatient to reach the next intellectual stop, while the tentative theory is simply accepted. Hence choice A is the answer.

Option B: The chapters of the book center around two competing models of human behaviour, a co-operative, farsighted wisdom that Mr Flannery dubs the "Gaian" approach and a reckless, ultimately destructive short-termism that he calls "Medean", after the bloodthirsty enchantress of Greek myth. But choice B (odds with each other) cannot be inferred. Choice B is not a limitation.

Option C: The word 'inability' in choice C renders it incorrect (He muses on whether humanity counts as a superorganism (a classification usually reserved for bees and ants), why we have yet to discover intelligent aliens). Choice C is not a limitation of the book.

Option D: Fewer examples more deeply explored might have added up to a more convincing case, and an easier read. The book has many illustrations but the concepts have not been explained in detail. So choice D is distorted.

Choice (A)

16. The passage discusses some limitations of the book "Here on Earth" in the third para but the reviewer's take is mentioned in the last para (first sentence) of the passage. (A take is a personal point of view.)

Option A: Some questions are raised in the book and then abandoned. Much of the material would repay a deeper look. But choice A is negative and it is incorrect from a reading of the last paragraph.

Option B: If the book is not all it could be, it is still worth reading, though less for answers than for its interesting hypotheses. It is healthy to be reminded of the various ways in which humans are influencing their environment .... This makes choice B the correct answer.

Option C: The book is still worth reading, **though less for answers** than for its interesting hypotheses. It is healthy to be reminded of the various ways in which humans are influencing their environment – most of them malign – and to recognise that even in an age of high technology, our prosperity and well-being depend on our natural environment. This means that it is more about human impact than human dependence.

Option D: The trouble is that the subject is far too big to fit comfortably into a book a little more than 300 pages long. But choice D is not the reviewer's take on the book in the final analysis. Hence choice D is not the correct answer.

Choice (B)

#### Solutions for question 17:

17. The author has used the technique of personification to tell us what genes are not (their function is not, as is sometimes believed, only to self-replicate). Then, by explaining that, through the process of evolution, they have interacted with proteins, he tells us what they are (their function is to interact). The penultimate sentence of the para has the important keywords "intimate interaction between consenting genes and proteins". Hence choice 4 (Genes are born to cooperate) best concludes and completes the para. Choice 4 which talks about cooperation also contrasts "**competitive** and selfish replicators" given in the second sentence of the para.

Choice 1 is inappropriate. It is a general sentence about evolution. It is more in the nature of an opening statement that can be further elaborated on through the example of the functions of genes.

Choice 2 is inappropriate. The para focuses specifically on genes and not on evolution.

Choice 3 is incorrect. It is in the nature of a continuing sentence, and would be ambiguous unless followed by an elaboration.

Choice 5 does not make sense. "these biological units" in choice 5 refers to "cells and organs" given in the penultimate sentence. The focus of the para is on genes.

Ans: (4)

#### Solutions for question 18:

18. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the para. It introduces the topic of discussion: ..... inequality in the

rich world. Sentence 2 is followed by sentence 4. The pronoun 'he' in sentence 4 points to "Thomas Piketty" in sentence 2. "ignited a furious debate about inequality in the rich world" in sentence 2 links with "focuses on the increasingly unequal distribution of wealth, and pays less attention to the growing disparity in wages" in sentence 4. Sentences 4 and 3 form a mandatory pair. "that disparity is ballooning" in sentence 3 links with "growing disparity in wages" mentioned in sentence 4. Sentence 3 provides the example (of America) for the point about the growing disparity in wages over the past three decades, given in sentence 4. Sentences 3 and 5 form another mandatory pair. "Similar trends" in sentence 5 links with "the best paid 1% of workers earned 191% more in real terms in 2011 than they did in 1980, whereas the wages of the middle fifth fell by 5%" in sentence 3. Sentence 5 concludes the para. So, 2435. Sentence 1 is out of scope. It needs a precedent and more substantiation.

Ans: (1)

#### Solutions for questions 19 to 24:

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

Number of words: 682

19. Option A: The first chapter of the Gita begins with a highly demoralized Arjuna but at the end of the 18<sup>th</sup> chapter of the Gita, Arjuna realizes the different dimensions of how he has to perform his duty and goes ahead to perform that task. But choice B is not complete. It fails to capture the point about 'uncertainty' that every manager of today faces. Hence choice A is not the answer.

Option B: The present day manager is in the same position as Arjuna was at the beginning of the war because of the uncertainty and ethical issues confronting him (para 4). Arjuna was in the field facing a difficult war. There were ethical issues as well as issues of uncertainty regarding the outcome of the war. Choice B is the correct answer.

Option C: A manager may be in the world of cut-throat competition but 'competition' alone may not include 'morality' and 'uncertainty' issues that are spoken about in paras 3 and 4. Hence choice C fails to capture the reason for the comparison of the modern day managers with Arjuna.

Option D: The author is not judgmental. So choice D which advocates a moralistic stance is not the answer for the question.

Choice (B)

20. Refer to the first para of the passage.

Option D: Much has been written recently by both management thinkers and other observers about the **uniquely Indian** characteristics of successful business leaders operating in India. These characteristics include, it is claimed, a commitment to inclusive growth, a long-term perspective on business objectives, and the much vaunted proclivity for *jugaad* – the improvisational ability to find workable solutions around seemingly intractable problems in the **business and academic space**. Hence choice D is the correct answer.

Option A: "gnomic term" means a difficult to understand term because it is enigmatic or ambiguous. The author does not say that *jugaad* is an ambiguous term. He defines *jugaad* quite clearly – the improvisational ability to find workable solutions around seemingly intractable problems .... Hence choice A is not the answer.

Option B: Choice B (most responsible for their success abroad) has not been mentioned in the passage.

Option C: "avoid difficult problems and find quick solutions" as given in choice C is not exactly correct. The author indicates that '*jugaad*' helps in handling 'seemingly insurmountable problems', not in circumventing difficult problems.

Hence only choice D is correct.

Choice (D)

21. The author says that one of the most important characteristics of a manager is the capacity for originality and creativity. Hence he has to think differently from others. He must be able to visualize things which others are not

considering at the moment. This is what he means by saying "one has to be a contrarian". Choice C is the answer.

Option A: "always weigh" in choice A makes it extreme in scope. The remainder of choice A cannot be inferred from para 5. Choice A does not answer the question.

Option B: Though 'contrary' seems to be the correct meaning of the word 'contrarian', choice B is not the contextual meaning as employed in the passage. Hence choice B is not the answer.

Option D: Choice D is negated from these lines given in para 5: the capacity for originality and creativity. Hence he has to think differently from others .... Choice D is not the answer.

Choice (C)

22. Refer to the third para of the passage.

Option A: Indian culture has mixtured great management thinkers. Much has been written recently by both management thinkers and other observers about the uniquely Indian characteristics of successful business leaders operating in India. But 'preponderance' does not mean only good or proficient, it means greater than the others in number, or in importance, (or in this case – in levels of success). There isn't enough in the passage to support that. So choice A is not the answer.

Option B: Indian thinking about management, leadership, or global strategy has been shaped by classical Indian literature such as the Bhagavad Gita. Hence choice B is false and is not the answer.

Option C: Indian thinking about management, leadership, or global strategy has been shaped by classical Indian literature such as the Bhagavad Gita. As far as India is concerned, if there is one source which distills the Indian ethics and values, it is the Bhagavad Gita. (Organizational culture is very much affected by values and ethos of a given society). ... To understand Hindu thinking and management practices, there is no better guide than the Gita. Hence Choice C applies and is the answer.

Option D: Choice D is negative about the Bhagavad Gita. It cannot be inferred from the third para of the passage.

Choice (C)

23. Statement (a): Meeting the challenge of management depends on the value perceptions of the individual which in turn are in tune with societal values. Organizational culture is very much affected by values and ethos of a given society. (see para 2). Hence the Bhagavad Gita which, in essence, is an exposition on Indian ethics and values helps by providing a view on societal values. Hence (a) is correct. Statement (b): Statement (b) has not been mentioned in the passage.

Statement (c): Statement (c) is not in keeping with the passage. The last para refers to the need for quality in work. There is no discussion on bias or concern about the results of work in the passage. Hence (c) does not apply.

Statement (d): Statement (d) can be inferred from the last para of the passage. The verse in the second chapter of the Gita brings out the fact that excellence in work is yoga. The concept of karma yoga is very much articulated by the Gita and shoddy work has no role to play. As the competition becomes severe, everybody is talking about the 'quality' jargon. Quality is nothing but a quest for perfection and excellence.

Hence statements (a) and (d) are correct.

Choice (A)

24. Refer to para 3. We have given up the permit-licence raj. In the era of licensing, competition was not so severe but in the era of economic liberalization, practically in every area there is going to be greater competition. The Indian economy is getting linked with the global economy. Competition and uncertainty are increasingly becoming a part of the management of enterprises in India. These lines show that (b) and (c) are true. So choice C is the correct answer.

Choice (C)

#### Solutions for question 25:

25. On a careful reading of the sentences, it can be observed that sentence 1 is a general sentence that begins the para. It introduces the topic of discussion: ..... Eleanor Roosevelt could have become president of the United States. Sentence 1 is followed by sentence 4. "longest-serving first lady" in sentence 4 points to "Eleanor Roosevelt" in sentence 1. "right side of history on virtually every subject, including civil rights, acceptance of European refugees and the ending of empires" in sentence 4 justifies the reason for believing that "Eleanor Roosevelt could have become president of the United States" given in sentence 1. Sentence 4 is followed by sentence 2. "She was also fierce in support of her causes" in sentence 2 continues after the description of "Eleanor Roosevelt" in sentence 4. Sentence 2 is followed by sentence 5. "she tirelessly lobbied her husband, Franklin Delano Roosevelt" in sentence 2 links with "Theirs was one of history's most powerful and enduring partnerships" in sentence 5. "to embrace her projects too" in sentence 2 also links with "embarked on her own independent career" in sentence 5. Sentence 5 is followed by sentence 3. "FDR encouraged her independence" in sentence 3 links with "embarked on her own independent career" in sentence 5. So, 14253.

Ans: (14253)

#### Solutions for question 26:

26. In part 1, "since" needs to be replaced with "for". We are referring to a period of time.

In part 2, the correct idiom is "to make room for" and not "to make rooms for". "to make room for" means to provide space for someone or something.

Part 3 is error-free.

Part 4 is incorrect. "dousing up" is incorrect usage. It needs to be replaced with "dousing" (dousing the protesters). The preposition 'for' needs to be replaced with the preposition 'of' (Images of the brutality).

In part 5, "as" needs to be replaced with "like" (spread like wildfire ....).

Ans: (3)

#### Solutions for questions 27 to 29:

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

Number of words: 431

27. Refer to the second para of the passage.

Option A: Both Baraka and Albert Murray, another prominent African-American historian of uniquely American music, tell the story of jazz in such a way as to underscore its birth out of the blues. So choice A is incorrect.

Option B: For Baraka, one of the more coherent ways of defining jazz is a synthesis of European instrumentation and the African-derived polyrhythms that, fundamentally, are the blues. Murray concentrates so much on jazz and jazz musicians that a reader who comes to his book looking for an analysis of the blues may feel shortchanged. Hence choice B is distorted.

Option C: Both Baraka and Albert Murray tell the story of jazz in such a way as to underscore its birth out of the blues. So the first part of choice C is correct. The second part of choice C is wrong.

Option D: For Baraka, one of the more coherent ways of defining jazz is as a synthesis of European instrumentation and the African-derived polyrhythms that, fundamentally, are the blues – even as jazz developed its own trajectory. Murray's tracing of this history in *Stomping the Blues* reiterates this common heritage but concentrates so much on jazz and jazz musicians that a reader who comes to his book looking for an analysis of the blues may feel shortchanged. Hence choice D is correct and is the answer.

Choice (D)

28. Option A: A narrative passage tells a story, usually from one person's viewpoint. A narrative passage is a sequence

of events and follows a story telling format. A narrative passage neither presents any analysis nor evokes any emotions. This passage is not narrative. Hence choice A is not the answer.

Option B: A descriptive passage makes a discussion vivid with detail. Here the author is not just presenting the points of view that different analysts have had, he is describing the kind of detail they used. Hence choice B is correct.

Option C: Analysis involves examining aspects of a situation in its pluses and minuses, and making an evaluation at the end of it. In this passage, the author does not analyze a situation. He does not weigh up any study. Hence choice C is not the answer.

Option D: The passage is not argumentative. There is no debate i.e. the passage does not present arguments and counterarguments for any idea or concept. The author refrains from delivering an argument; neither does he try to convince people of an argument. Hence choice D is incorrect.

Choice (B)

**29. Refer to the third para of the passage.**

Option A: Choice A has not been mentioned in the passage and is the answer.

Option B: The self-sufficiency message Kofsky finds in jazz proto-nationalism is a celebration of a unique African-American aesthetic, one that **contested** the aesthetic imperialism of the white critics who promoted the value and **determined the negotiating power** of the mostly black musicians within the system of white-owned recording and performance institutions. Hence choice B is true and is not the answer.

Option C: At the height of the free jazz movement, self-sufficiency imperatives were the driving force behind the independent recording facilities and cooperatively owned performance venues with which Coltrane and Coleman experimented. So choice C is true and is not the answer.

Option D: These movements stressed the need for community self-sufficiency in the face of a systemically racist white majoritarian society and **although** the black nationalist (black separatist) message was often simplistically **opposed** to the integrationism attributed to Martin Luther King and the Civil Rights Movement, their **community development efforts** – after-school arts programs for children, musical benefits to feed people struggling with food insecurity, “neighborhood watch” security efforts – **still stand as tangible models for grassroots solidarity**. Choice D is correct and is not the answer.

Choice (A)

**Solutions for question 30:**

- 30.** On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the para. It has some proper nouns (Parisians, .... Salle Pleyel, Champs Elysées) and introduces the background: Parisians wanting to hear a great classical pianist or a world-class orchestra. Sentence 3 is followed by sentence 5. “Parisians wanting to hear a great classical pianist or a world-class orchestra would head for the Salle Pleyel” in sentence 3 links with “That option is no longer available” in sentence 5. Also “the venue” in sentence 5 points to “the Salle Pleyel near the Champs Elysées” in sentence 3. “Parisians wanting to hear a great classical pianist or a world-class orchestra” in sentence 3 contrasts “other kinds of music” in sentence 5. Sentence 5 is followed by sentence 4. “the venue or option (Salle Pleyel) is no longer available” in sentence 5 links “will move to the Philharmonie de Paris” in sentence 4. “top-tier orchestras and musicians, including Pleyel’s resident ensemble, the Orchestre de Paris” in sentence 4 parallels “Parisians wanting to hear a great classical pianist or a world-class orchestra would head for the Salle Pleyel” given earlier in sentence 3. Sentence 4 is followed by sentence 1. “The new venue” in sentence 1 points to “Philharmonie de Paris” in sentence 4. Sentence 1 concludes the para. So, 3541. Sentence 2 sounds like an introductory sentence of another para. It is the odd sentence out.

Ans: (2)

**Solutions for question 31:**

- 31.** Exaptation refers to the process by which features acquire functions for which they were not originally adapted or selected. Adoption describes a process, when an organism, as a result of ongoing evolution, develops the ability to use a feature of its surroundings that would have been inaccessible to it in an earlier stage of evolution.

The para indicates that, while we have only sketchy understanding of the significance of the three processes viz, adaptations, exaptations and adoptations (at present), we are equipping ourselves with the experimental tools that would put us on the road to better understanding. Choice 5 is the sentence that completes the para correctly.

Choices 1 and 4 are inappropriate. The para does not refer to vanity or pride that we may have (or display) in our scientific pursuits.

Choice 2 is inappropriate. While the para indicates our present lack of understanding, it does point to the possibility that we may be able to build up our understanding.

Choice 3 is illogical in terms of cause and effect. Ridding ourselves of ignorance can happen only when we expand our knowledge.

Ans: (5)

**Solutions for questions 32 to 34:**

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

Number of words: 446

- 32.** The passage begins with the thought: Do the languages we speak shape the way we think? The central idea of the passage is evident in the last sentence of the passage.

Option A: Choice A sounds far-fetched. There is no discussion about “what makes us human, and getting a peek into the very nature of human nature.”

Option B: When bilingual people switch from one language to another, they start thinking differently, too. .... This new research shows us that the languages we speak not only reflect or express our thoughts, but also shape the very thoughts we wish to express. The structures that exist in our languages profoundly shape how we construct reality, and help make us as smart and sophisticated as we are. Hence choice B is the answer.

Option C: From the second para, we can say that we need to mark the verb for tense in English and in Russian. This is not necessarily so in Indonesian. In Turkish, you would have to include in the verb how you acquired this information. We can infer from this, that in Turkish we need to mark the verb for tense. Hence choice C is not true. Choice C does not form the central idea of the passage.

Option D: Charlemagne proclaimed that “to have a second language is to have a second soul.” But the idea went out of favor with scientists when Noam Chomsky proposed that there is a universal grammar for all human languages which don’t really differ from one another in significant ways. Hence it made no sense to ask whether linguistic differences led to differences in thinking. But this is the content presented in para 3. But, if one keeps reading, we can see how the way we see the world also shapes our thinking. In fact, this is stated as such in the last para - “New research shows us that the languages we speak not only reflect or express our thoughts, but also shape the very thoughts we wish to express”.

Choice D can be ruled out because the relationship is between (i) language, a human faculty, and thought, also a human faculty and between (ii) language differences and thought differences. But it’s not as if language itself (as a human faculty) gives rise to differences in thought.

Choice (B)

- 33.** Refer to para 5 which elaborate on what the patterns of language reveal about a culture. Patterns in language offer a window on a culture’s dispositions and priorities. ... So does the language shape cultural values, or does the influence go the other way, or both?

Option A: The second para gives an example of a nursery rhyme to tell us how much languages can differ from one another. The passage does not speak about how language plays a role in deciding how connotations of words need to vary greatly from culture to culture. Choice A is not the answer.

Option B: Choice B is out of scope of the given passage.

Option C: Patterns in language offer a window on a culture's **dispositions** and **priorities**. For example, English sentence structures focus on agents, and in our criminal-justice system, justice has been done when we've found the transgressor and punished him or her accordingly. The author uses English as an example to say that conceptions of **justice** may vary. Does the language shape **cultural values**, or does the influence go the other way, or both? Hence choice C can be inferred to be true.

Option D: English sentence structures focus on **agents**. So the passage talks about language influencing human agency. {"agency" refers to the capacity of individuals to act independently and to make their own free choices, based on their will}. We cannot infer that human language discusses the importance given to human actions. Hence choice D is not the answer.

Choice (C)

34. Option A: "Words can influence our performance" in choice A can be inferred from "their performance can change dramatically if people's ability to use language is taken away". But the quoted sentence in the question does not refer to the evolutionary feature of language. Hence choice A is not the answer.

## SECTION - II

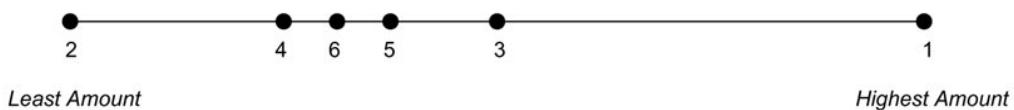
### Solutions for questions 1 to 4:

Since each person paid an average of the previous two persons, the person who were first and second would have paid the highest and the lowest in any order.

From (ii), since Bhanu paid the least, Bhanu must have been 1<sup>st</sup> or 2<sup>nd</sup>. But if Bhanu is first, then Gaurav, who consulted immediately after Bhanu, must have paid the highest. But this is not possible. Hence, Bhanu must have been 2<sup>nd</sup> and Gaurav, 3<sup>rd</sup>.

Since the first person paid the highest and the second person paid the least, the third person, would have paid more than the second person and less than the first person. The fourth person would have paid less than the third person and more than the second person. The fifth person would have paid more than the fourth person and less than the third person. The sixth person would have paid more than the fourth person and less than the fifth person.

The diagram below shows the relative amounts that each person paid, with 1 to 5 representing the first to fifth person to consult the doctor:



From (iii), Dinesh consulted before Amar and paid less than him. Hence, Dinesh and Amar can be 4<sup>th</sup> and 5<sup>th</sup> or 4<sup>th</sup> and 6<sup>th</sup> persons to consult the doctor. In either case, Dinesh is 4<sup>th</sup>. Also, the only person who can be the first to consult the doctor is Chetan.

If Amar is 6<sup>th</sup>, let Amar pay x. Dinesh paid x - 100. Jitesh would be fifth and he should have paid x + 100.

Gautam (who was third) must have paid x + 300 (only then will the average of the fee paid by third and fourth persons be equal to the fee paid by fifth person). The person who paid the least must have paid x - 500. The person who paid the highest must have paid x + 1100. Since Bhanu paid 1000, x must be 1500 and Chetan must have paid 2600. This is not possible according to (i).

If Amar is 5<sup>th</sup>, let Amar pay x. Dinesh paid x - 100. Gautam would have paid x + 100. Bhanu would have paid x - 300. Chetan would have paid x + 500. In this case, x = 1300 and Chetan would have paid 1800.

Therefore, Chetan paid Rs. 1800, Bhanu paid Rs. 1000, Gaurav paid Rs. 1400, Dinesh paid Rs. 1200, Amar paid Rs. 1300 and Jitesh paid Rs. 1250.

1. The highest amount was paid by Chetan, i.e. Rs. 1800.  
Ans: (1800)
2. The last person to consult the doctor was Jitesh.  
Choice (A)
3. The total amount paid by all the six persons is Rs. 7950.  
Choice (D)

Option B: That language has shaped thought has been emphasized in other parts of the passage. Choice B is out of context and does not emerge from the sentence given in quotes.

Option C: The passage does not say that there is a universal language common to all humans. So choice C is not the answer.

Option D: The first para of the passage poses the question: Do English, Indonesian, Russian and Turkish speakers end up understanding and remembering their experiences differently simply because they speak different languages? The last para states: The structures that exist in our languages profoundly shape how we construct reality, and help make us as smart and sophisticated as we are. If you take away people's ability to use language in a simple nonlinguistic task, their performance can change dramatically, making them look no smarter than rats or infants. Hence choice D is the answer.

Choice (D)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	-
Easy	-
Medium	7, 13, 15, 19, 21, 22, 24, 26, 27, 30
Difficult	2, 3, 4, 6, 8, 9, 10, 11, 12, 14, 16, 17, 18, 20, 23, 25, 28, 29, 31, 32, 33
Very Difficult	1, 5, 35

### Solutions for questions 5 to 8:

Let a, o and b represent the number of apples, bananas and oranges.

From the first exchange,  $a + o = 2o + 3b \Rightarrow a = o + 3b$   
 From the second exchange,  $2a = 3o + b \Rightarrow 2o + 6b = 3o + b \Rightarrow o = 5b$   
 Therefore,  $a = 8b$

5. Xi'jaee could not have exchanged one banana for any other fruit. Hence, he must have exchanged either one apple or one orange.

By exchanging one apple, he would have ended up with 8 bananas OR 1 orange and 3 bananas.

Since we have to minimize the total number of fruits with him, he would have exchanged one apple for 1 orange and 3 bananas (only a total of 4 fruits).

Therefore, he must have a minimum of 3fruits of each type after the exchange. Hence, before exchange, he must have had 4 apples, 2 oranges, i.e., a total of 6 fruits.

If he exchanged one orange, he would have got 5 bananas. In this case, he must have had 5 apples and 6 oranges, i.e., a total of 11 fruits.

The minimum possible number of fruits that he could have had is 6.  
 Ans: (6)

6. Xio'tole would have had the same value of fruits before or after the exchange. Hence, the total number of fruits that he has in terms of bananas =  $4 \times 8 + 3 \times 5 + 5 = 52$ , which is the maximum possible price that he can pay for the boat.  
 Considering the worth of each choice in bananas, we find that the options A, B, C and D are worth 47, 55, 57 and 52 bananas respectively. Hence, the answer is option D.  
 Choice (D)

7. The total number of fruits that Xigumbe had with him in terms of bananas =  $6 \times 8 + 11 \times 5 + 9 = 112$

After the exchange, if he had k fruits of each type, then the value of these fruits in terms of bananas =  $8k + 5k + k = 14k$

Since the two values must be the same,  $k = \frac{112}{14} = 8$

To get 8 fruits of each type, he can exchange 3 oranges and 1 banana for two apples. Hence, he has to exchange 4 fruits in total.  
 Choice (B)

8. Let the number of apples, oranges and bananas with her be a, o and b.

Since she exchanged two oranges, the number of oranges with her will become  $o - 2$ .

With 2 oranges, she can get 1 apple and 2 bananas or 10 bananas.

Hence, the number of fruits with her after the first exchange can be

Case (i):  $a + 1, o - 2, b + 2$

Case (ii):  $a, o - 2, b + 10$ .

She also exchanged 2 apples for oranges and bananas. She can get 3 oranges, 1 banana OR 2 oranges 6 bananas OR 1 orange 11 bananas OR 16 bananas.

The following table provides the number of fruits with her for case (i) and case (ii):

Case (i)		
a - 1	o + 1	b + 3
a - 1	o	b + 8
a - 1	o - 1	b + 13
a - 1	o - 2	b + 18

Case (ii)		
a - 2	o + 1	b + 11
a - 2	o	b + 16
a - 2	o - 1	b + 21
a - 2	o - 2	b + 26

After this she exchanged 8 bananas for 1 apple. The cases listed above will be modified as shown in the following table:

Case (i)		
a	o + 1	b - 5
a	o	b
a	o - 1	b + 5
a	o - 2	b + 13

Case (ii)		
a - 1	o + 1	b + 3
a - 1	o	b + 11
a - 1	o - 1	b + 16
a - 1	o - 2	b + 21

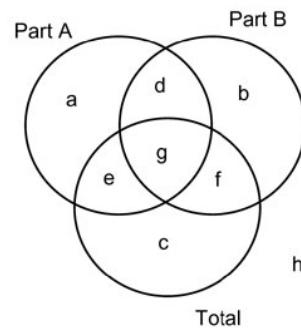
For the cases highlighted in gray, the number of bananas will be more than 6 (since there are at least  $b + 5$  bananas). Hence, the total number of fruits will be at least 27.

For the cases in the first row of case (i) and case (ii), o should be at least 2 (since she exchanged 2 oranges at the beginning). Therefore,  $o + 1$  will be 3. This implies that the number of fruits after the exchanges should be 9 (3 of each type).

For the case in the second row of case (i), the number of oranges should be a minimum of 2. The number of fruits after the exchanges will be 6 (2 fruits of each type). Hence, this is the minimum number of fruits that she can have after the exchange.

Ans: (6)

#### Solutions for questions 9 to 12:



Let the following Venn diagram represent the number of students who cleared each of the three cutoffs.

From (i), a

$$a + d + e + g = \frac{1}{3} \times (100 - g)$$

From (ii),  $e = c$

$$\text{From (iii), } f = a + b + c - 30 \Rightarrow a + b + c = f + 30$$

From (iv),  $b = 2f$

$$\text{From (v), } d + e + f + g = 34$$

Also, the number of students who passed the test will be  $100 - 87 = 13$

$$\therefore g = 13$$

$$\text{From (vi), } h = 6 + g \Rightarrow h = 19$$

$$\text{From (v), } d + e + f = 21$$

$$\text{From (i), } a + d + e = 16$$

$$\text{Also } (a + b + c) + (d + e + f) + g + h = 100 \Rightarrow f + 30 + 21 + 13 + 19 = 100 \Rightarrow f = 17$$

$$\text{From (iv), } b = 34$$

$$\text{From (v), } d + e = 4$$

$$\text{From (i), } a = 12$$

$$\text{From (iii), } 12 + 34 + c = 17 + 30 \Rightarrow c = 1$$

From (ii),  $e = 21$  and from (v),  $d = 3$

9. Number of students who did not clear exactly one of the three cutoffs =  $a + b + c = 47$   
 Ans: (47)

10. All the students who cleared the cutoffs in both Part A and Part B would have scored more than 30 marks. The others need not have scored more than 30.

Hence, the required number of students =  $d + g = 3 + 13 = 16$ .  
 Choice (A)

11. Number of students who passed the test =  $g = 13$

Number of students who failed the test = 87

Required difference = 74.  
 Choice (C)

12. Option A:  $a + d + g + e = 29$

Option B:  $b + d + g + f = 67$

Option C:  $c + f + g + e = 32$

Option D:  $h = 19$

Hence, option B is the highest.  
 Choice (B)

**Solutions for questions 13 to 16:**

13. To find the minimum number of blue bikes, we must maximize the number of vehicles of other colours.  
The number of red cars can be 17 or 34 (since there are only 45 red vehicles).  
If the number of red cars are 17, number of black bikes will be 5 and the number of yellow vans will be 4.  
To minimize the number of blue bikes, let there be  $45 - 17 = 28$  red bikes (since there are 17 red cars) and there can be  $60 - 4 = 56$  yellow bikes.  
The number of blue bikes should be at least  $176 - 28 - 56 - 5 = 87$  blue bikes.  
If there are 34 cars, the number of red bikes will reduce by 17 (i.e., 11 red bikes) and the number of yellow bikes will decrease by 4 (i.e., 52 yellow bikes). The number of black bikes will be 10.  
In this case, the number of blue bikes will be  $176 - 11 - 52 = 113$  blue bikes which is not possible as there are only 90 blue vehicles.  
Hence, there can be a minimum 87 blue bikes.

Ans: (87)

14. Let the blue cars and blue bikes comprise all of the blue vehicles.

$$\frac{56x}{100} + \frac{176x}{100} = 90$$

**Solutions for questions 17 to 20:**

The total votes received by the five candidates across the nine wards is given in the first table below. The second table provides 15% of the total votes polled in each ward.

Candidate	Votes
Adam	1630
Ben	1409
Chris	1530
George	1616
Michael	1215

Ward	Votes	15% of Votes
Ward 1	900	135
Ward 2	1100	165
Ward 3	600	90
Ward 4	1200	180
Ward 5	1000	150
Ward 6	800	120
Ward 7	500	75
Ward 8	600	90
Ward 9	700	105

Adam would have been elected as the mayor, since he received the highest number of votes.

Adam received less than 15% votes in Ward 1, Ward 4, Ward 7 and Ward 9. Ben and Chris received at least 15% votes in all the wards. George received less than 15% votes in Ward 6 and Ward 7. Michael received less than 15% votes in Ward 3, Ward 4 and Ward 5.

Only Ben and Chris are eligible to be Councilmen. Among the two, Chris received the higher number of votes and will be elected the Councilman.

Except for Adam, all the others are eligible for Administrator. Among them, Ben received the maximum number of votes in one ward. Chris received the maximum number of votes in one ward. George received the maximum number of votes in three wards. Michael received the maximum number of votes in two wards.

Hence, George will be elected as the Administrator.

Adam received the maximum number of votes in four wards. Hence, Adam will be elected as the Commissioner as well.

17. The Mayor, Adam, in Ward 6 received 200 votes. The Administrator, George, received 245 votes in Ward 9.  
Hence, the difference = 45. Choice (A)
18. Adam will be elected for more than one post.  
Choice (B)

19. Required difference =  $1630 - 1530 = 100$   
Choice (C)
20. Since the mayor and commissioner are the same,  $a = d$ .  
From the options, only option D satisfies.  
Choice (D)

**Solutions for questions 21 to 24:**

The following table presents the 10% range of marks for each student and the students that can be a part of the study group, if that student were made the monitor:

Student	Marks	-10%	+10%	Group
A	78	70.2	85.8	C, D, F, G, I, K
B	67	60.3	73.7	H, K
C	79	71.1	86.9	A, D, F, G, I
D	81	72.9	89.1	A, C, F, G, I, L, J
E	94	84.6	103.4	I, J, L
F	84	76.6	92.4	A, C, D, I, J, L
G	74	66.6	81.4	A, B, C, D, K
H	63	56.7	69.3	B
I	85	77.5	93.5	A, C, D, F, J, L
J	89	80.1	97.9	D, E, F, I, L
K	71	63.9	78.1	A, B, G
L	88	79.2	96.8	D, E, F, I, J, L

21. If the students given in the options must be the only students in the study group, one of them must be the monitor.

Option A: If A is the monitor, B cannot be in the group. If B is the monitor, D and F cannot be in the group. If D is the monitor, B cannot be in the group. If F is the monitor, B cannot be in the group. Hence, this is not possible.

Option B: If C is the monitor, L cannot be in the group. If F is the monitor, G cannot be in the group. If G is the monitor, F and L cannot be in the group. If L is the monitor, C and G cannot be in the group.

Option C: If C is the monitor, L cannot be in the group. If I is the monitor, this group can be formed. Hence, this is possible with I as the monitor of the group.

Option D: If F is the monitor, G cannot be in the group. If G is the monitor, F, I, J cannot be in the group. If I is the monitor, G and I cannot be in the group. If J is the monitor, G cannot be in the group. Hence, this is also not possible. Therefore, only the group given in option C is possible.

Choice (C)

22. H can be part of any group only when B is the monitor. Hence, H and B must be in the same group.

Choice (D)

23. Since B and H must be in the same study group, the maximum size of this study group can be 3 (with B, H and K). Hence, Ankit can form a minimum of 4 groups (each with 3 students). One way in which the study groups can be formed is (B, H, K), (A, F, G), (C, D, I) and (J, E, L). (The bold letters represent the monitors).

Choice (C)

24. If D, G and L must be in the same group, the monitor must be D. Both G and L cannot be the monitors. From the options, L cannot be the monitor.

Choice (D)

#### Solutions for questions 25 to 28:

From (ii), F could have displayed 53 kg or 61 kg or 64 kg. The actual weight could be 50 kg or 58 kg or 61 kg. From (iii), the actual weight cannot be 50 kg and F could not have displayed 53 kg.

C could have displayed 64 kg or 70 kg and B could have displayed 58 kg or 64 kg. In either case, 64 kg would be displayed by either B or C. Hence, F cannot display 64 kg. Hence, F must have displayed 61 kg and the actual weight must be 58 kg. Since B did not display the actual weight, B must have displayed 64 kg and C must have displayed 70 kg.

From (i), A and D both could not have displayed the actual weight. Hence, A must have displayed 53 kg and D must have displayed 50kg. E must have displayed the actual weight, which is 58 kg.

The following table presents this information:

Triumphant Institute of Management Education Pvt. Ltd. (T.I.M.E.) HO: 95B, 2<sup>nd</sup> Floor, Siddamsetty Complex, Secunderabad – 500 003.

Tel : 040–27898195 Fax : 040–27847334 email : info@time4education.com website : www.time4education.com AIMCAT1807.Sol/10

Machine	Weight
A	53
B	64
C	70
D	50
E (Actual Weight)	58
F	61

25. The actual weight of Himesh is 58 kg.

Ans: (58)

26. The difference in weight is 20 kg.

Ans: (20)

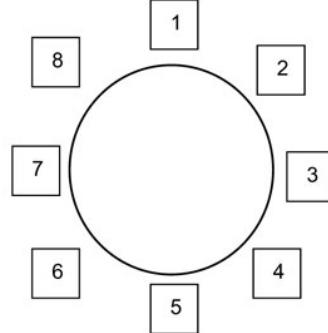
27. Machine A displayed 53 kg.

Ans: (53)

28. Machine B would display 26 kg.

Ans: (26)

#### Solutions for questions 29 to 32:



Let the adjacent diagram represent the positions of the seats around the table.

From (iii), B, who is from Britain, is sitting opposite H, who is from India. Let B be at 5 and H be at 1.

From (vii), the delegate from France must be at 7.

From (vi), D, who is from China, is opposite the delegate from India. The delegate from India cannot be at 8 or 2 (since one of the delegates from India is at 1). D and the delegate from India cannot be at 7 and 3 in any order because the delegate at seat 7 is from France. Hence, D and the delegate from India can be at 2 and 6 OR 8 and 4 in that order.

If D is at 2, then the delegate at 3 cannot be from China. From (v), the delegate at 4 cannot be from China (since B, at 5, is from Britain). The other delegate from China has to be at 8. The delegates from USA have to be at 3 and 4. But this violates the condition that no two delegates from the same country are sitting adjacent each other. Hence, this case is not possible.

If D is at 8, the delegate from India must be at 4. From (i), one of the delegates from China is sitting opposite F. This delegate cannot be D because D is sitting opposite a delegate from India and F is not from India. The other delegate from China and F cannot be at 3 and 7 because F is not from France. Hence, the other delegate from China and F must be at 2 and 6, in any order. From (v), the delegate from China cannot be at 6. Hence, F must be at 6 and the other delegate from China must be at 2.

Also, F must be from USA and the person sitting at 3 must also be from USA.

Since H has voted Yes, the other delegate from India (sitting at 4) must have voted No. From (vi), D must also have voted No. The delegate from China (sitting at 2) must have voted Yes (since D voted No). The delegate from USA sitting at 3 must have voted No because the delegates at 1 and 2 both voted Yes and three delegates sitting consecutively did not cast the same vote.

Since the delegate from India (at 4) voted No, B must have voted Yes.

From (ii), A and G cast the same vote. Hence, they must be at 3 and 4.

Since A voted No, F must have voted Yes (since they are from the same country). Since B and F (at 5 and 6) both voted Yes, the delegate from France (at 7) must have voted No. From (vi), C must be the delegate from France (since C voted No). E must be the delegate from China (sitting at 2).

The following table presents the positions of the delegates, the countries they are from and their votes:

Position	Person	Country	Vote
1	H	India	Yes
2	E	China	Yes
3	A	USA	No
4	G	India	No
5	B	Britain	Yes
6	F	USA	Yes
7	C	France	No
8	D	China	No

29. Four delegates voted Yes. Choice (B)  
 30. C is from France. Choice (C)  
 31. F is sitting two places away from G and is not from China. Choice (D)  
 32. The given condition is satisfied for all the delegates. Choice (A)

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

### SECTION – III

#### Solutions for questions 1 to 34:

1. From the given information, we can write the following equations:

$$\begin{aligned} X &= a + nk \\ Y &= a + nm \\ \Rightarrow \frac{X+Y}{2} &= \frac{a+nk+a+nm}{2} = a + (m+k) \frac{n}{2} \end{aligned}$$

If  $m + k$  is odd, then the units digit of  $\frac{X+Y}{2}$  when

expressed in base  $n$  will be  $a + \frac{n}{2}$ .

If  $m + k$  is even, then the units digit of  $\frac{X+Y}{2}$  when expressed in base  $n$  will be  $a$ .

$$\therefore a = 2 \text{ and } a + \frac{n}{2} = 5$$

$$\Rightarrow n = 6$$

Ans: (6)

2. The program actually gives the sum of the indices of the prime numbers when the number is factorised into prime factors.

For example if  $x = 18 = 2^1 3^2$ , the output is  $1 + 2 = 3$  as shown in the table below.

Step	x	t	R = Rem $\frac{x}{t}$	Sum
1	18	2		0
2.1			0	1
3.1	9			
2.2			1	
3.2		3		
2.3			0	
3.3	3			2
2.4			0	
3.4	1			3
2.5			1	
3.5		4		

From among the choices, the sum of the indices in only  $1800 = 2^3 \times 3^2 \times 5^2$  is  $3 + 2 + 2 = 7$  Choice (D)

3. Let the number of persons in the group be  $n$ , the original average weight of the group be  $a$  and the weight of the new person be  $w$ .

$$\text{Given, } \frac{na + w}{n+1} = a + 1$$

$$\Rightarrow w = n + a + 1 \quad \dots \quad (1)$$

$$\text{Also, } \frac{na + w - 50}{n} = a - 1 \Rightarrow w = 50 - n$$

$$\therefore n + a + 1 = 50 - n \Rightarrow 2n + a + 1 = 50 \quad \dots \quad (2)$$

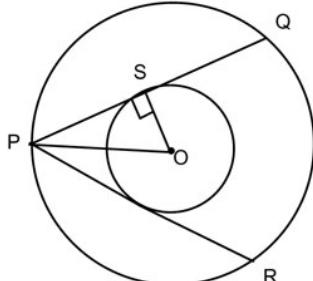
From (1) and (2), we can say that only statements I and IV are definitely true. Choice (C)

4.  $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $B = \{2\}$ ,  $C = \{7\}$   
 Now,  $n(S \cap B) = 1 \Rightarrow S$  contains '2'  
 and  $n(S \cap C) = 0 \Rightarrow S$  does not contain '7'.  
 Since '2' must be included and '7' must not be included, we can first consider the set  $\{1, 3, 4, 5, 6, 8, 9, 10\}$ .  
 Now from this, the total number of subsets ( $S$ ) is  $2^8$  or 256  
 In all these 256 subsets, we can now include 2. Choice (D)

(Choice (D) can be eliminated as the total number of subsets of  $A$  itself, with any conditions, is 1024)

5. Let the cost price and selling price be  $C$  and  $S$  respectively  
 $S = C (1.4) (0.9)$   
 $\therefore \text{Gross Profit (P)} = C(1.4 \times 0.9 - 1) = 0.26C$   
 $\text{Net Profit} = P(0.9) = 468$   
 $\Rightarrow P = 520 \Rightarrow C(0.26) = 520 \Rightarrow C = 2000$

Choice (C)

- 6.
- 

Let 'O' be the centre of the circle.  
 Let the radius of the inner circle be  $r$ .

The radius of the outer circle will be  $3r$  (since, the area of the outer circle is 9 times the area of the inner circle).  
Let S be the point of contact of the tangent PQ to the inner circle.

$$PS = \sqrt{PO^2 - OS^2} = \sqrt{(3r)^2 - r^2} = 2r\sqrt{2}\text{cm}$$

Let  $\angle SPO = \theta$

$$\sin \theta = \frac{OS}{OP}, \cos \theta = \frac{PS}{OP}$$

$$\angle QPR = 2 \angle SPO = 2\theta$$

$$\sin 2\theta = 2\sin \theta \cos \theta = \frac{2r \cdot 2r\sqrt{2}}{(3r)^2} = \frac{4r^2\sqrt{2}}{9r^2} = \frac{4\sqrt{2}}{9}$$

$$PQ = 2PS \text{ and } PR = PQ$$

$\therefore$  Area of  $\triangle PQR$

$$= \frac{1}{2} PQ(PR) \sin(\angle QPR)$$

$$= \frac{1}{2} (4r\sqrt{2})(4r\sqrt{2}) \sin 2\theta$$

$$= 16r^2 \left( \frac{4\sqrt{2}}{9} \right) = \frac{64r^2}{9}\sqrt{2}$$

$$\text{Given } \pi(3r)^2 = 36$$

$$\Rightarrow \pi r^2 = 4 \Rightarrow r^2 = \frac{4}{\pi}$$

$$\therefore \text{Area } \triangle PQR = \frac{64}{9} \left( \frac{4}{\pi} \right) \sqrt{2} = \frac{256\sqrt{2}}{9\pi} \text{ sq.cm.}$$

Choice (A)

7. Time taken by A =  $\frac{9}{8}$  (time taken by B + C)

$$\text{Time taken by B} = \frac{10}{7} \text{ (time taken by A + C)}$$

So efficiency ratio of

$$A \text{ and } (B + C) \text{ is } 8 : 9 \quad \dots (1)$$

$$B \text{ and } (A + C) \text{ is } 7 : 10$$

Hence, from (1), when A, B and C work together, A will contribute  $8/17^{\text{th}}$  of the work.

Similarly, from (2), when A, B and C work together, B will contribute  $7/17^{\text{th}}$  of the work.

So, C should do the  $2/17^{\text{th}}$  of the work, when all the three work together.

Since C can do the entire work in 63 days, he will take

$$\frac{2}{17} \times 63 \text{ days i.e., } 7 \frac{7}{17} \text{ days.} \quad \text{Choice (A)}$$

8. Given x and y are positive integers and  $x^y = y^{60}$ . If  $a^x = b^y$  and x, y are integers, one of them should be a factor of the other.

$$\text{For example } 2^6 = 64 = 8^2 = 4^3$$

$$1, 2, 3, 6, \text{ are all factors of } 6.$$

$$60 = 2^2 \times 3 \times 5$$

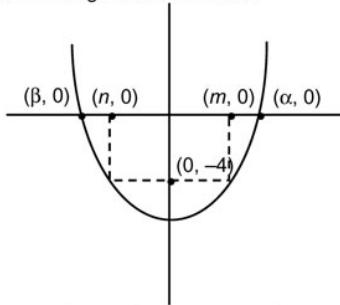
Number of factors of 60 =  $3 \times 2 \times 2 = 12$

$\therefore$  y can take 12 values. For each y, there will be a corresponding value of x.

$$\text{For instance, } y = 20 \Rightarrow x^{20} = 20^{60} = (20^3)^{20} \Rightarrow x = 20^3$$

Ans: (12)

9. Consider the diagram shown below:



$$\text{Let } y = (x - m)(x - n) - 4 \quad \dots (1)$$

In the above equation, for  $x = m$  and  $x = n$ , we get  $y = -4$ .

$$\text{Again } (x - m)(x - n) - 4 = x^2 - (m+n)x + mn - 4$$

The discriminant for the quadratic equation  $y = 0$  is

$$\{-(m+n)\}^2 - 4(1)(mn - 4)$$

$$= m^2 + n^2 - 2mn + 16 = (m-n)^2 + 16$$

Since the discriminant is greater than 0, the roots are real and distinct.

Let the roots be  $\alpha$  and  $\beta$ , where  $\alpha > \beta$ .

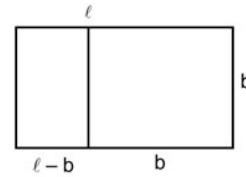
Now, the co-efficient of  $x^2$  is 1, (i.e., positive). The graph is a parabola that opens upwards as shown in the figure above.

We can see that the roots lie in  $(-\infty, n)$  and  $(m, \infty)$ .

**Alternative solution:**

With some basic understanding of graphs, this question can be solved very easily by first imagining the graph of  $(x - m)(x - n) = 0$ , which will intersect the x-axis at  $x = m$  and  $x = n$ , i.e.,  $(m, 0)$  and  $(n, 0)$ . Now the graph of  $(x - m)(x - n) - 4 = 0$  is simply the original graph being pulled downwards by 4 units. In the process, clearly the new points of intersection of the curve with the x-axis will now move away from each other in opposite directions. Thus one of the roots of  $(x - m)(x - n) - 4 = 0$  will lie between  $-\infty$  and  $n$  and the other root will lie between  $m$  and  $+\infty$  (given that  $m > n$ ). Choice (B)

10. Let the length and the breadth of the original rectangle be  $\ell$  and  $b$  respectively. The length and breadth of the smaller rectangle after a square of side  $b$  cut is  $b \times (\ell - b)$ .



$$\text{Given that } \frac{\ell}{b} = \frac{b}{\ell-b}$$

$$\Rightarrow \ell^2 - \ell b - b^2 = 0 \Rightarrow \left(\frac{\ell}{b}\right)^2 - \left(\frac{\ell}{b}\right) - 1 = 0$$

$$\Rightarrow \frac{\ell}{b} = \frac{1 \pm \sqrt{5}}{2} \text{ since } \frac{\ell}{b} > 0, \frac{\ell}{b} = \frac{\sqrt{5}+1}{2}$$

$$\text{The required ratio} = \frac{b^2}{b(\ell-b)} = \frac{b}{\ell-b} = \frac{1}{\frac{\ell}{b}-1}$$

$$= \frac{1}{\frac{\sqrt{5}+1}{2}-1} = \frac{2}{\sqrt{5}-1} = \frac{\sqrt{5}+1}{2} \approx 1.618$$

**Note:** Such a rectangle is called the golden rectangle, and the ratio, 1.618, is called the golden ratio.

Ans: (1.618)

11. Let us select three numbers  $(a, b, c)$ , of the given 12 numbers. The number of ways in which we can select 3 numbers is  ${}^{12}C_3 = \frac{(12)(11)(10)}{(3)(2)(1)} = 220$ .

Since in each selection, we can have only one possible arrangement such that  $a > b > c$ .

$\therefore$  The total number of sets = 220. Choice (D)

12. Let the four-digit number be  $abcd$ .

$$a+b = \frac{4}{5}(c+d) \quad \dots (1)$$

$$a+d = b+c \quad \dots (2)$$

$$\text{Also, given } a < b \quad \dots (3)$$

(1)  $\Rightarrow$  sum of the digits must be divisible by 9.  
 (2)  $\Rightarrow$  sum of the digits must be even.  
 $\therefore$  (1) and (2)  $\Rightarrow$  the sum of the digits must be divisible by 18 and hence must be 18 or 36.  
 But the sum cannot be 36 since, in that case  $a = b = c = d = 9$  and condition (3) is violated. Hence the sum must be 18.  
 $\therefore a + b = 8, c + d = 10$  and  $a + d = b + c = 9$   
 $a + d - (a + b) = 1$ , i.e.,  $d = b + 1$   
 As  $a < b$ ,  $abcd$  can be  
 1728, 2637, 3546  
 $\therefore$  3 possible numbers exist.

Choice (B)

13. We denote the superfast train as S and the passenger train as P. Due to the single track, only one train can travel at a time.

Sum of the times taken by the two trains = 1.5 hours.  
 $= 90$  min  
 The ratio of speeds of S and P is 4 : 1.  
 $\therefore$  They take times in the ratio 1:4 for the same distance XY. The super fast train takes 18 minutes and the passengers train takes 72 minutes.  
 When late by 30 minutes, S starts at 8:30 am. Since it doubles its speed it takes half the time and reaches after 9 minutes i.e., at 8:39 a.m.  
 Now P starts at 8:39 a.m. and reaches X at 9:30 am as per scheduled time i.e., it takes 51 minutes  
 $\therefore$  The ratio of times taken for S and P = 9 : 51  
 $\therefore$  ratio of speeds of P and S = 9 : 51 i.e. 3 : 17

Choice (C)

14.  $a = \log_n 54 = \log_n 2 + 3 \log_n 3$

$$b = \log_n 72 = 3 \log_n 2 + 2 \log_n 3$$

$$\log_n 1728 = 6 \log_n 2 + 3 \log_n 3$$

$$\text{Suppose } \log_n 1728 = xa + yb$$

$$\text{Then } x + 3y = 6 \text{ and } 3x + 2y = 3$$

$$\text{Solving for } x \text{ and } y, x = \frac{-3}{7} \text{ and } y = \frac{15}{7}$$

Choice (B)

15. Let the number of mangoes purchased by B = x.

A	B
Mangoes	$x + 23$
Bananas	$7 - x$

Let the price of one mango and one banana be M and B respectively.

Given that

$$Mx + 23M + 7B - xB = Mx + 40B - xB$$

$$\Rightarrow 23M = 33B$$

$$\therefore M : B = 33 : 23$$

$$\text{Given } M - B = 10$$

$$\therefore M = 33 \text{ and } B = 23$$

**Alternative Solution:**

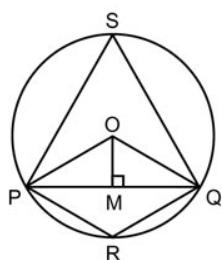
A has 23 mangoes more, when compared to B, but has 10 fruits less on the whole. Therefore, B must have 33 bananas more, when compared to A. Since, the two of them spent equal amounts, extra expenditure by A on mangoes (over B) = extra expenditure by B on bananas (over A).

$$\Rightarrow 23 \times \text{cost of a mango} = 33 \times \text{cost of a banana}$$

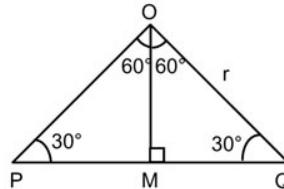
Since each banana costs ₹10 less than a mango cost of banana = ₹23 and mango = ₹33

Choice (C)

- 16.



Let PQ be the chord of the circle with centre O. Let R and S be points on the minor arc and major arc respectively. Given that  $\angle POQ = \angle PRQ = x^\circ$  (say)  
 $\Rightarrow \angle POQ = 2(\angle PSQ) = 2(180^\circ - x^\circ)$   
 $(x^\circ = 360^\circ - 2x^\circ \text{ (} x = 120^\circ \text{)}$   
 $\therefore$  In the triangle OPQ, let  $OP = OQ = r$  (the radius of the circle).



The chord parallel to PQ, which is equal in length to PQ, is twice as far from PQ as the centre itself.

$$\Rightarrow \text{The distance between the chords} = 2\left(\frac{r}{2}\right) = r$$

$\therefore$  The ratio of the radius and the distance = 1 : 1  
 Choice (A)

17. Let the capacities of the three taps be  $r, s$  and  $t$ .

$$\text{Given } r + s + t = \frac{1}{2} \text{ and } s = 4t$$

$$\Rightarrow s + t = 5t = \frac{1}{2} - r$$

$$\text{Further } (r)(x) + (5t)(y) = 1 \text{ and } x + y = 4$$

$$\text{Hence } (r)(x) + \left(\frac{1}{2} - r\right)(4 - x) = 1$$

$$\Rightarrow 4rx - 8r - x + 2 = 0$$

$$\Rightarrow (x - 2)(4r - 1) = 0$$

$$\Rightarrow x = 2 \text{ or } r = \frac{1}{4}, \text{ but } x \neq y.$$

$$\text{Hence } r = \frac{1}{4} \text{ and } t = \frac{1}{5} \left(\frac{1}{2} - r\right) = \frac{1}{20}$$

Hence T alone takes 20 hours.

**Alternative Solution:**

Let the capacities of the three taps be 'a' units, 4 units and 1 unit per hour. Now total capacity of the tank is  $(a + 4 + 1) \times 2$  units. Also,  $[(a \times x) + (4 + 1)(y)]$  will be the capacity of the tank. Hence  $(a + 5) \times 2 = [ax + 5(4 - x)]$ .

$$\Rightarrow 2a + 10 = (a - 5)x + 20$$

$\Rightarrow a(2 - x) = 5(2 - x)$ , but since  $x \neq y \neq 2$ , we get  $a = 5$  and the capacity of tank =  $2(a + 5) = 20$  units.

$\Rightarrow$  T alone can fill the tank in 20 hours. Choice (C)

18. Of the numbers formed with the given digits, i.e., 0, 1, 2, 3, 4, the numbers ending with either 1 or 3 are odd. Since we want all the numbers less than 1000 and not just three-digit numbers, we don't have any restriction on zero being the left most digit. So, the hundreds digit as well as the tens digit can be filled by any of the five digits and the units can be filled with either 1 or 3. So, there are  $5 \times 5$  i.e., 25 numbers ending in 1 and 25 ending in 3.

Suppose 1 is fixed in the hundreds place, the tens place can be filled by any of the five digits and units place by 1 or 3.

So, 1 is in the hundreds place in 10 numbers. Same is the case with 0, 2, 3 and 4.

Similarly each of 0, 1, 2, 3 and 4 are used in the tens place in 10 numbers.

$\therefore$  The sum of all the required numbers

$$= (10)[0 + 1 + 2 + 3 + 4][100] + (10)[0 + 1 + 2 + 3 + 4][10] + 25[1 + 3] = 10000 + 1000 + 100 = 11100$$

Ans: (11100)

19.  $|x - 4| = |x| + |x - 3|$

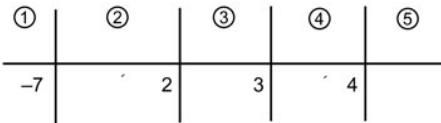
To solve this we need to take the ranges of x.

$$(i) \quad x > 4 \\ x - 4x + x - 3$$

- $\Rightarrow x = -1$  [But  $x > 4$  (assumption)]  
Hence not valid
- (ii)  $3 < x < 4$   
 $\Rightarrow 4 - x = x + x - 3 \Rightarrow 7 = 3x$   
 $x = 7/3$  [Again not valid as  $x$  lies between 3 and 4]
- (iii)  $0 < x < 3$   
 $4 - x = x + 3 - x$   
 $x = 1$  (valid)
- (iv)  $x < 0$   
 $4 - x = -x + 3 - x$   
 $x = -1$  (valid)
- Choice (B)

20. 
$$\begin{aligned} & \frac{22}{(x-3)(x-4)} + \frac{12}{x-3} + 1 \leq 0 \\ & = \frac{22+12(x-4)+(x-3)(x-4)}{(x-3)(x-4)} \leq 0 \\ & = \frac{22+12x-48+x^2-7x+12}{(x-3)(x-4)} \leq 0 = \frac{x^2+5x-14}{(x-3)(x-4)} \leq 0 \\ & = \frac{(x+7)(x-2)}{(x-3)(x-4)} \leq 0 = \frac{(x+7)(x-2)(x-3)(x-4)}{(x-3)^2(x-4)^2} \leq 0 \\ & \Rightarrow (x+7)(x-2)(x-3)(x-4) \leq 0 \end{aligned}$$

The critical points are  $-7, 2, 3, 4$



When  $x = 0$  the inequation is true.

$\therefore$  In region (2) and (4) the inequation will be true. (The sign of the expression alternates)  
Solution set is  $[-7, 2] \cup (3, 4)$  [ $: x \neq 3$  or 4, as  $(x-3)$  and  $(x-4)$  appear in the denominator of the expression]  
The integral solutions are  $-7, -6, -5, -4, -3, -2, -1, 0, 1, 2$ , i.e., 10.  
Ans: (10)

21. Let  $n$  and  $m$  be the two prime numbers when  $n$  is divided by  $m$ , we get  $r$  as quotient and also  $r$  as remainder  
 $\Rightarrow n = mr + r = r(m + 1)$   
but  $n$  is prime  
 $\Rightarrow r = 1$  and  $m + 1 = n$   
 $\Rightarrow m, n$  are consecutive and prime, this is true only for  $n = 3, m = 2$ . Only 1 case.  
Ans: (B)
22. Let the ages (in  $\mu s$ ) of A and B at  $t = -2\mu s$  be  $a$  and  $b$  respectively.  
 $\therefore a = 3b + 18$  (given) ——— (1)  
Let the age of A be thrice of B's age after  $x \mu s$   
 $\Rightarrow (a + x) = 3(b + x)$  ——— (2)  
 $\Rightarrow 18 = 2x$  (from (1) and (2))  $\Rightarrow x = 9\mu s$   
 $\Rightarrow$  Required time  $= -2\mu s + 9\mu s = 7\mu s$

#### Alternative solution:

With each passing microsecond, A ages by  $1 \mu s$ , while 3 times B's age increases by  $3 \mu s$ .  
 $\therefore$  The difference (A's age - 3 B's age) decreases by  $2 \mu s$ .  
At  $t = -2 \mu s$ , this difference is  $18 \mu s$ .  
 $\therefore$  At  $t = (-2 + 9) \mu s$ , this difference will be  $0 \mu s$ .  
 $\therefore t = 7 \mu s$

23. The answer is 4. This is possible, when all the four planes in the squadron are flying in positions corresponding to the four vertices of a regular tetrahedron.  
This can be deduced by first observing that any three planes flying equidistant from each other define an equilateral triangle and we can add at most one more plane along the vertical axis (i.e., perpendicular to the plane of the triangle) while still ensuring that all planes are equidistant from each other.  
Ans: (4)

	A	B	C
Speeds ratio	100 : 90 : 80		
Distances	550	500	450

$\therefore$  Ratio of times  $= \frac{550}{100} : \frac{500}{90} : \frac{450}{80}$   
 $\therefore$  A finishes the race first.

Choice (A)

25. Let the perpendicular sides be  $a$  and  $b$ . Let the hypotenuse be  $c$ .  
 $abc = 33600$   
 $ab = \frac{33600}{c}$   
 $a + b + c = 112$   
 $a + b = 112 - c$   
Squaring both sides,  
 $a^2 + b^2 + 2ab = (112 - c)^2$   
 $c^2 + 2\left(\frac{33600}{c}\right) = 112^2 - 224c + c^2$   
 $c^2 - 56c + 300 = 0$   
 $c = 6$  or 50  
As  $c = 6$  is not possible,  $c = 50$ .

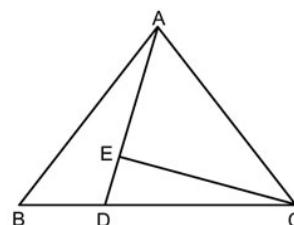
#### Alternative Solution:

Consider a Pythagorean triplet  $a, b, c$  such that  $a + b + c$  is a factor of 112.  
Hence, by trial and error,  $a = 7, b = 24$  (or vice versa) and  $c = 25$ .  
Hence the sides of the triangle must be 14, 48 and 50.

Ans: (50)

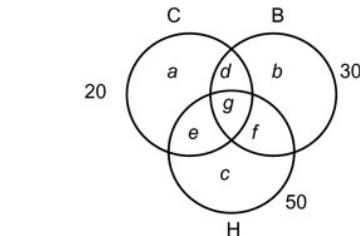
26. Consider the following set of values of  $a, b, c, p, q, r$ .  
 $a = 4, b = 16, c = 8$   
 $p = 3, q = 2, r = 1$   
 $a^{p-q} b^{q-r} c^{r-p} = 4^{(3-2)} 16^{(2-1)} 8^{(1-3)} = 4^1 (16^1) (8^{-2}) = 1$   
 $\therefore$  None of choices A, B, C is true. Choice (D)
27.  $a^n - b^n$  is divisible by  $(a - b)$  whether  $n$  is even or odd, and is divided by  $(a + b)$  when  $n$  is even.  
Here  $a = 5, b = 4$  and  $n = 4R$ , where  $R$  is even.  
 $\therefore a^{4R} - b^{4R}$  is divisible by  $a + b = 9$ , since  $4R$  is even.  
When  $a = 5^4$  and  $b = 4^4$ ,  $a^n + b^n$  is divisible by  $(a + b)$  when  $n$  is even.  
Here  $n = R$ . Since  $R$  is even.  
 $\therefore 5^{4R} - 4^{4R}$  is divisible by  $5^4 + 4^4 = 625 + 256 = 881$  also  
 $5^{4R} - 4^{4R}$  is divisible by  $5^4 - 4^4 = 369$   
Since 41 is a factor of 369.  
 $\therefore 5^{4R} - 4^{4R}$  is divisible by 41 also. Choice (C)

28.  $CD = 2BD \Rightarrow CD = \frac{2BC}{1+2} = \frac{2}{3}$  of BC



Since  $CD = (2/3)$  of BC, area of  $ADC = (2/3)$  area of ABC.  
Let  $AE = k$  times  $AD$ , area of  $AEC = k$  times area of  $ADC$   
 $= k (2/3)$  of  $ABC = \left(\frac{100}{187.5}\right)$  of  $ABC$  (because  $\Delta ABC$  is 87.5% more than  $\Delta AEC$ ).  
Hence  $\frac{2k}{3} = \frac{100}{187.5} \Rightarrow k = 4/5$   
 $\Rightarrow AE : AD = 4/5 \Rightarrow AE : ED = 4 : 1$  Choice (D)

29. Consider the diagram below.



$$\begin{aligned}d + e + f &= 20 \\a + b + c &= 30 \\a + d + g + e &= 20 \\b + d + g + f &= 30 \\c + e + g + f &= 50\end{aligned}$$

Adding the above three equations  
 $a + b + c + 2(d + e + f) + 3g = 100$   
 $30 + 2 \times 20 + 3g = 100 \Rightarrow g = 10$ .

**Alternative solution:**

The number of students who play cricket, basketball and hockey is 20, 30, 50 respectively.  
The number of students who play exactly 1 game, 2 games and 3 games is 30, 20 and  $x$  (say). Therefore number of student games (a student playing a game) is  $20 + 30 + 50 = 30 + 2(20) + 3x$   
 $\Rightarrow x = 10$  Choice (B)

30. Let  $\frac{30}{x}$  and  $x$  be two numbers. Their product is 30. If  $x > 0$ ,  $y$  will be minimum when the numbers are equal. If  $x < 0$ ,  $y$  will be maximum when the numbers are equal.

$$\begin{aligned}\Rightarrow \frac{30}{x} &= x \\ \Rightarrow x &= -\sqrt{30} \text{ gives } y \text{ max} = -2\sqrt{30}\end{aligned}$$

$$Y \text{ max} = -\sqrt{120}$$

$\therefore$  The greatest integral value that  $y$  can assume is -11.  
Ans: (-11)

31. We have 22 different numbers (60 to 81) available to us to fill in the boxes. Since each number can go into a maximum of 3 boxes, out of 64 boxes we have to use 21 numbers (each occurring in 3 boxes) to fill in 3 boxes. Since we want the least number of apricots, we will use the 21 numbers from 60 to 80. The 64<sup>th</sup> box will be filled with 81 apricots.  
Total number of apricots =  $3 \times (60 + 61 + \dots + 80) + 81$   
 $= \frac{3(60 + 80)}{2} (21) + 81 = 4,410 + 81 = 4,491$

Choice (C)

32. Amount due at the end of first year =  $1.1 \times 50000$   
= ₹55,000  
Amount due at the beginning of the second year = ₹45,000  
Amount due at the end of the second year =  $1.1 \times 45000$   
= ₹49,500  
Amount due at the beginning of the third year = ₹39,500  
Amount due at the end of the third year =  $1.1 \times 39500$   
= ₹43,450  
Amount due at the beginning of the fourth year = ₹33,450  
Amount due at the end of the fourth year =  $1.1 \times 33450$

$$= ₹36,795$$

Amount due at the beginning of the fifth year = ₹26,795  
 $\therefore$  Amount due at the end of the fifth year  
 $= 1.1 \times 26795 = ₹29474.5$  Choice (D)

33. The data is tabulated below.

	Cone (C <sub>1</sub> )	Cylinder (L <sub>1</sub> )
Height	$h$	$r$
Base Radius	$r$	$h$
Height	(C <sub>2</sub> )	(L <sub>2</sub> )
Base Radius	$h$	$r$

$$\text{Volume of L}_1 = \pi h^2 r ; \text{Volume of C}_1 = \frac{1}{3} \pi r^2 h$$

$$\text{Given } \pi r^2 h = 9 \left(\frac{1}{3}\right) \pi r^2 h \Rightarrow h = 3r$$

$$\text{Volume of L}_2 = \pi r^2 h ; \text{Volume of C}_2 = \left(\frac{1}{3}\right) \pi r^2 h$$

$$\Rightarrow \frac{\text{Volume of L}_2}{\text{Volume of C}_2} = \frac{\pi r^2 h}{\left(\frac{1}{3}\right) \pi r^2 h} = \frac{3r^2 h}{h^2 r} = 3 \left(\frac{r}{h}\right) = 1 : 1$$

Choice (C)

34.  $(2^{1783}) / (73) = (2^{1783}) (7) / 73(7)$   
 $= (2^9)^{198} (2) (7) / (2^9 - 1) = (14) (2^9)^{198} / (2^9 - 1)$   
Using remainder theorem, the remainder of the above division is 14. As we have multiplied the dividend and the divisor by 7, the remainder will also be multiplied by 7.  
Actual remainder =  $14/7 = 2$

**Alternative solution:**

$$\begin{aligned}\text{Rem} \left( \frac{2^6}{73} \right) &= \text{Rem} \left( \frac{64}{73} \right) = -9 \Rightarrow \text{Rem} \left( \frac{2^9}{73} \right) \\&= -9 \times 2^3 = -72 \equiv 1 \\&\therefore \frac{2^9}{73} \text{ gives 1 as remainder.} \\&\Rightarrow \text{Rem} \left( \frac{2^{1783}}{73} \right) = \text{Rem} \left( \frac{(2^9)^{198} \times 2}{73} \right) = 2.\end{aligned}$$
Ans: (2)

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