

**(Key and Solutions for AIMCAT1709)**

**Key**

**SECTION – I**  
**SUB-SECTION: RC**

1. C	6. A	11. A	16. B	21. A
2. A	7. B	12. B	17. A	22. A
3. B	8. C	13. C	18. B	23. D
4. D	9. C	14. B	19. B	24. 45
5. B	10. D	15. C	20. C	

**SUB-SECTION: VA**

1. 42513	3. 25413	5. 35241	7. 3	9. 3
2. 51432	4. 13254	6. 2	8. 3	10. 4

**SECTION – II**  
**SUB-SECTION: DI**

1. C	5. 20	9. A	13. C
2. D	6. D	10. D	14. 5
3. A	7. C	11. A	15. D
4. B	8. 11	12. 230	16. D

**SUB-SECTION: LR**

1. A	5. D	9. 6	13. D
2. C	6. 1	10. B	14. A
3. D	7. 6	11. 17	15. B
4. B	8. B	12. 10	16. B

**SECTION – III: QA**

1. B	8. D	15. A	22. D	29. D
2. D	9. B	16. 84	23. 65	30. C
3. B	10. 63	17. 13	24. C	31. 8
4. 9920	11. 0	18. B	25. D	32. B
5. B	12. A	19. 2	26. C	33. 14
6. 2	13. A	20. 983040	27. C	34. 1296
7. C	14. 4	21. C	28. 616	

**Solutions**

**SECTION – I**  
**SUB-SECTION: RC**

**Solutions for questions 1 to 6:**

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

Number of words: 708

- The last sentence of the first paragraph states that "He may well be one of those crazy, splendid people who, as Charles Bukowski put it, if marooned on a desert island would use a stick to scratch stories in the sand." Option A: The author mentions that Tao Lin "seems to be writing for the best reason, the only reason – because he's a writer". This gives an indication of the commitment he has towards writing. To emphasize this, the author

quotes Charles Bukowski. But the author does not imply that Tao Lin uses unconventional writing implements. Hence, this option is incorrect.

Option B: The author does not talk about the hardships faced by Tao Lin. We cannot infer from the passage about his hardships in life. Hence, this option is also incorrect.

Option C: The author wishes to emphasize his passion for writing and quotes Bukowski to point out that he will keep writing no matter the circumstances. Hence, this is the correct answer.

Option D: The author does not talk about the style of Tao Lin's writing and does not compare his writing with the desperation of a man marooned on an island. Hence, this option is also incorrect.

Therefore, the correct answer is option C.

Choice (C)

2. The passage mentions that Tao Lin is "one of the kings of that empire of online bootstrappers". The author further says that he doesn't "know his work through the Web".  
 Option A: The author mentions that Tao Lin is an online bootstrapper. However, the author does not know his work through the Web. This would imply that Tao Lin, being an online bootstrapper, would have published his works through the Web. Hence, we can infer that online bootstrappers are authors who predominantly use the internet to publish their books. It helps, here, to be aware of the idiom – to pull oneself up by the bootstraps (meaning: to improve through one's own efforts). Familiarity with that idiom would have helped you arrive at this answer quickly, since you'd have connected it with the knowledge that writers on the Internet post stuff on their own, without the need for the medium of a publishing house.  
 Option B: The author does not specifically talk about the topics of the works of Tao Lin. Further, he does not allude to any connection between the topic of work and online bootstrappers. Hence, this option is incorrect.  
 Option C: While the author mentions that Tao Lin has a writing style which is weird and memorable, he does not say that when talking about online bootstrapping. Hence, this option cannot be the answer.  
 Option D: The definition of online bootstrappers as people who use internet to earn their livelihood is too general and does not fit in with the context of the passage. Hence, this option is also incorrect.  
 Therefore, the correct answer is option A.  
 Choice (A)
3. The passage talks about Paul, who is the protagonist of the novel Taipei written by Tao Lin. The passage mentions that "Paul's existence depends on walking, sitting in cabs, flying on planes, riding in the backs of cars".  
 Option A: The passage mentions that Paul is constantly present online. However, the sentence mentioned in the question refers to his constant physical travel and not about his online presence. Further, we cannot infer from the passage that he is always online to escape his surroundings. Hence, this option cannot be inferred from the passage.  
 Option B: The passage mentions that Paul's existence depends on travelling. From the statement "he's always either somewhere other than where he just was, or on his way to somewhere else", he is constantly travelling. Hence, this option is the correct answer.  
 Option C: The passage does not talk about Paul not concentrating on the people around him. Hence, this option is also incorrect.  
 Option D: We cannot infer from the passage that he is running away from his parents' home. Further, the passage mentions that one of the places that Paul travels to is "his parents' home in Taiwan". Hence, this option is also incorrect.  
 Therefore, the correct answer is option B.  
 Choice (B)
4. The passage talks about Paul and the places that he travels to. It also provides a glimpse of his character.  
 Option A: Paul and Erin get married in Las Vegas (mentioned in the fourth paragraph). The last paragraph of the passage also mentions that "Paul and Erin start to love each other more" after they reach Taipei. However, we cannot conclude from this that Paul falls in love with Erin in Taipei. We can only say that they loved each other more in Taipei. Hence, this option is incorrect.  
 Option B: The author compares Paul to Jake. In the case of Paul, "Xanax and Ecstasy take the place of Burgundy, Champagne and gin". We can say that Paul consumed Xanax and Ecstasy (the passage also mentions that Paul's pill-popping is "nonstop"). But we cannot say that he consumes large quantities of Burgundy, Champagne and gin. Hence, this option is incorrect.  
 Option C: The passage does not talk about Paul resolving to stop using Facebook and Google. This is not the correct answer.
5. According to the author, Taipei is "Lin's third novel, it's also, in a sense, a classic first novel".  
 Option A: The passage does not talk about Taipei being the first novel made available as a book with paper pages. Hence, this option is incorrect.  
 Option B: The author calls Taipei a "classic first novel" because "it's semi-autobiographical and it's a bildungsroman... life is larger than he thought it was". The style and setting of the novel is common to the first novels of many authors. Hence, this option is correct.  
 Option C: The passage does not mention that this is the first novel to be published. Hence, this option is also incorrect.  
 Option D: The author does not talk about the freshness of Tao Lin's writing. Hence, we cannot say that this is the reason why the author labelled the novel as "classic first novel".  
 Hence, the correct answer is option B.  
 Choice (B)
6. The penultimate paragraph of the passage talks about travelling and its benefits.  
 Option A: The passage does not mention this to be a benefit of travelling. Hence, this is the correct answer.  
 Option B: The passage mentions that "Travel has traditionally been a way for people to realize that their own perspectives are limited". Hence, this has been mentioned in the passage and is not the correct answer.  
 Option C: This is also mentioned in the passage regarding travelling. Hence, this option is also incorrect.  
 Option D: The passage mentions that travelling helps realize that "there's more to the world and other people than they'd assumed". Hence, this option is also mentioned in the passage.  
 Therefore, the correct answer is option A.  
 Choice (A)

### Solutions for questions 7 to 9:

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

Number of words: 448

7. The second and third paragraph of the passage talks about the history of anxiety and stress through the medieval age and the 19<sup>th</sup> century.  
 Option A: The passage mentions that burnout "appears in medieval theology as acedia, a listless indifference to worldly life brought about by spiritual exhaustion". It also talks about the painting of "Melancholia I" which was painted during Renaissance. But the passage does not mention about relation between anxiety and modern life during this period. Hence, this option is incorrect.  
 Option B: The passage mentions that "But it was not until the second half of the 19th century that writers began to link this condition to the specific stresses of modern life.". Hence, we can infer that in the 19<sup>th</sup> century, this link was explored first. Hence, this option is correct.  
 Option C: The 2012 study mentioned in the passage does not conclusively prove the relation between anxiety and stresses of modern life. Hence, this option is also incorrect.  
 Option D: While the passage mentions a study where there is a correlation between anxiety and stresses of modern life, it does not provide enough information to conclusively prove or disprove this link. Hence, this option cannot be inferred.  
 Therefore, the correct answer is option B.  
 Choice (B)
8. The passage talks about introducing meditation as way to "alleviate the strain". However, it also mentions that meditation "becomes yet another task at which you can succeed or fail".

Option A: The passage mentions that the "Schemes cooked up by management theorists since the 1970s" have "simply blurred the lines between work and leisure". However, the author does not refer to meditation when making this statement. Hence, this is not the correct answer.

Option B: The passage does not mention that meditation was cooked up by management theorists in the 1970s. "The chummy, backslapping banter, the paintballing away-days, the breakout rooms in bouncy castles" are the schemes that the passage refers to. Hence, this is not the correct answer.

Option C: The intention of the companies mentioned in the passage is to alleviate stress. However, meditation becomes "yet another task at which you can succeed or fail". Further, the passage also mentions that "Those who can't clear out their mind need to try harder". Hence, this activity ends up becoming something which the employee needs to achieve and adds to the stress of the employee. Hence, this is the correct answer.

Option D: The passage does not talk about the efficiency with which employees can meditate. Hence, this option is also incorrect.

Therefore, the correct answer is option C.

Choice (C)

9. The passage mentions *acedia* in the second paragraph and *Neurasthenia* in the third paragraph.

Option A: *Neurasthenia* does not refer only to working professionals. It is "an illness endemic to the pace and strain of modern industrial life". Hence, this option is incorrect.

Option B: *Acedia* was not defined by Albrecht Dürer, the painter. Hence, this option is also incorrect.

Option C: The passage mentions that *acedia* is "a listless indifference to worldly life brought about by spiritual exhaustion". *Neurasthenia* is nervous exhaustion and is "an illness endemic to the pace and strain of modern industrial life". Hence, we can say that *Neurasthenia* is brought on by modern industrial life. Therefore, this is the correct answer.

Option D: The passage does not define *acedia* as confined only to life in the medieval age. Hence, this option does not correctly define *acedia* and is not the correct answer.

Therefore, the correct answer is option C.

Choice (C)

#### Solutions for questions 10 to 12:

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

Number of words: 516

10. Refer to the second, third and fourth paragraphs of the passage.

Option A: If you see litter on the street, or encounter broken bridges, you are likely to just blame the local administration. Economists, however, will wager that there could be deeper forces at work. Hence choice A is not the answer.

Option B: The last sentence of para 3 suggests that historical or cultural conflicts may often prevent different sub-groups in a region or country from collectively demanding state services that cater to all rather than to special interests. But choice B (undue pressure on state services to promote social diversity) is out of scope and does not answer the question.

Option C: Para 4 says that districts that are more heterogeneous spend less on education and infrastructure and spend more on law enforcement and health. But lack of funds for roads and infrastructure due to excessive spending on law enforcement and health is not a reason for untidy roads and broken bridges in a state. Hence choice C is incorrect.

Option D: The most influential thesis in political economy suggests that poor infrastructure in a locality could be because of social divisions. So choice D is the answer.

Choice (D)

11. Option A: In his 1965 book, *The Logic of Collective Action: Public Goods and the Theory of Groups*, American economist Mancur Olson argued that heterogeneous and complex societies see the rise of sectional interests that aim to grab public resources to their advantage. Hence choice A is correct.

Option B: Subsequent research by other economists showed that the provision of public goods tends to be lower in areas with high ethno-linguistic diversity or polarization because it is difficult for people to agree on the provision of public goods that benefit everyone. This is not necessarily the viewpoint of Mancur Olson. Hence choice B is not the answer.

Option C: Olson also argued that heterogeneous societies with greater economic inequality may see better provision of a public good if the elite group benefits the most from its provision. This contradicts choice C. So choice C is not correct.

Option D: The passage does not state any relation between heterogeneity and conflicts. So choice D is convoluted and is not the answer.

Choice (A)

12. A recent paper by Rachel Gisselquist, Stefan Leiderer and Miguel Nino-Zarazua of the United Nations University challenges the conventional wisdom that social divisions tend to hinder the provision of public goods. They find that there is a positive association between ethnic diversity and public expenditure, underscoring the point that even though diversity negatively affects public goods provision at a national level, the effect may not be same at the state or district level.

Option A: They find that there is a positive association between ethnic diversity and public expenditure, underscoring the point that even though diversity negatively affects public goods provision at a national level, the effect may not be same at the state or district level. ("subvention" in choice A) means "provision". Hence choice A is not correct.

Option B: social divisions tend to hinder the provision of public goods. A recent paper by Rachel Gisselquist, Stefan Leiderer and Miguel Nino-Zarazua of the United Nations University challenge this conventional wisdom. Context matters. The relationship between social divisions and public goods is linked via state capacity and the strength of institutions. Political scientists have long recognized these channels through which public goods provisioning works in different contexts. The response of the polity and of the state to social division determines collective action or the lack of it. Hence choice B is correct.

Option C: ..... underscoring the point that even though diversity negatively affects public goods provision at a national level, the effect may not be same at the state or district level. Choice C reverses the order and states the contrary viewpoint. Hence choice C is incorrect.

Option D: Rachel Gisselquist, Stefan Leiderer et al do find that there is a positive association between ethnic diversity and public expenditure. But another scientist suggests that fragmentation may not necessarily lead to worse state performance if political elites are able to forge a common identity that bridges over social fault lines. Hence choice D cannot be inferred.

Choice (B)

#### Solutions for questions 13 to 18:

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

Number of words: 753

13. The quoted text in the question is from para 3 of the passage.

Option A: The first para mentions that Globalization has helped hundreds of millions of people attain higher standards of living, beyond what they, or most economists, thought imaginable but a short while ago. But choice A does not point to the quoted text in para 3. Hence choice A is not the answer.

- Option B: Choice B has not been suggested in the passage.
- Option C: If globalization continues to be conducted in the way that has been in the past, if we continue to fail to learn from our mistakes, globalization will not only not succeed in promoting development but will continue to create poverty and instability. The backlash that has started will mount and discontent with globalization will grow. This makes choice C the answer.
- Option D: The first para states that globalization has helped hundreds of millions of people. The second para says that for millions of people globalization has not worked. But choice D is not specific to the question and does not answer it. Choice (C)
- 14.** Refer to para 3. The backlash that has started will mount and discontent with globalization will grow.
- Option A: Globalization will not only not succeed in promoting development but will continue to create poverty and instability. Hence choice A is not correct.
- Option B: Para 2 also hints at the "backlash" mentioned in para 3. Many have actually been made worse off, as they have seen their jobs destroyed and their lives become more insecure. They have felt increasingly powerless against forces beyond their control. They have seen their democracies undermined, their cultures eroded. Para 4 talks about: Environmentalists seeking to prohibit the importation of goods that are made using techniques that harm the environment -- with nets that kill an endangered species, or electricity produced by generators that pollute the air ..... So choice B is the right answer.
- Option C: Globalization will not succeed in promoting development but will continue to create poverty and instability. Hence choice C is not the answer.
- Option D: Choice D is part of the problem: If globalization continues to be conducted in the way that has been in the past ..... It does not refer to the consequences or the "backlash" mentioned in para 3. So choice D is incorrect. Choice (B)
- 15.** The problem is that the typical central bank governor begins his day worrying about inflation statistics, not poverty statistics; the trade minister worries about export numbers, not pollution indices.
- Option A: The greatest challenge is not just in the institutions themselves but in mind-set. Choice A is inappropriate, since the quoted sentence actually indicates that those people's mindsets may revolve around being accountable in their institutional roles, but implies that they may not focus on larger issues which should also draw their attention.
- Option B: Choice B is extreme in scope and is not the answer.
- Option C: Caring about the environment, making sure the poor have a say in decisions that affect them, promoting democracy and fair trade are necessary if the potential benefits of globalization are to be achieved. Hence choice C is the interpretation of the quoted sentence in the question.
- Option D: Inflation statistics and export numbers are more important than inflation statistics and pollution indices for certain classes of people. But choice D is a generalization which is extreme. It does not answer the question. Choice (C)
- 16.** The IMF is **not just** concerned with technical arrangements among bankers, such as how to make bank check-clearing systems more efficient. The IMF's actions affect the lives and livelihoods of billions throughout the developing world; yet they have little say in its actions. (This means that the billions of people should have a say in the actions of the IMF). Hence choice B is the answer.
- Option A: Choice A is incomplete. The IMF is **not just** concerned with technical arrangements among bankers.
- Option C: A careful reading of para 7 will tell us that choice C is wrong. But the mind-set of an institution is inevitably linked to who it is directly accountable. The IMF is **not just** concerned with technical arrangements among bankers, such as how to make bank check-clearing systems more efficient. The IMF's actions affect the lives and livelihoods of billions throughout the developing world; yet they have little say in its actions.
- Option D: Choice D deals with another context. Voting rights matter, and who has a seat at the table -- even with limited voting rights -- matters. It determines whose voices get heard. Choice D does not specifically answer the question. Choice (B)
- 17.** Option A: Choice A is not a strategy to deal with the greatest challenge discussed in the passage. Hence it is the answer.
- Option B: Para 6 mentions: The greatest challenge is not just in the institutions themselves but in mind-set: Caring about the environment, making sure the poor have a say in decisions that affect them, promoting democracy and fair trade are necessary if the potential benefits of globalization are to be achieved. The first sentence of para 7 also says: There needs to be a change in mind-set so as to ensure that globalization works. Without **reform**, the backlash that has started will mount and discontent with globalization will grow. The developed world needs to do its part to **reform** the international institutions that govern globalization. Hence choice B is correct and is not the answer.
- Option C: Just as the IMF gives short shrift to the concerns of the poor, the WTO puts trade above all else. From para 4 and from para 6, one can say that choice C can be a solution for the challenge discussed in the passage. Hence choice C is not the answer.
- Option D: Towards the end of the passage, there is focus on "Increasing openness and transparency" and "change in governance." So choice D is true and is not the answer. Choice (A)
- 18.** Option A: They genuinely believe the agenda that they are pursuing is the general interest. This makes choice A incorrect.
- Option B: While the institutions seem to pursue commercial and financial interests above all else, they do not see matters that way. Choice B is correct.
- Option C: In spite of the evidence to the contrary, many trade and finance ministers, and even some political leaders, believe that everyone will eventually benefit from trade and capital market liberalization. Choice C is besides the point and does not answer the question.
- Option D: Choice D occurs in another para (para 4). Just as the IMF gives short shrift to the concerns of the poor -- there are billions available to bail out banks, but not the paltry sums to provide food subsidies for those thrown out of work as a result of IMF programs -- the WTO puts trade over all else. It does not answer the question. Choice (B)

#### Solutions for questions 19 to 24:

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

Number of words: 726

- 19.** The inanimate has a large and vital presence in his work. That much is evident from the beautiful show at the Walters Art Museum in Baltimore, curated by George Maunet, "Manet: The Still-Life Paintings."
- Option A: Edouard Manet's still-life paintings were displayed at the show at the Walters Art Museum in Baltimore. But Edouard Manet did not organize the show at the Walters Art Museum in Baltimore. Hence choice A is not the answer.
- Option B: George Maunet curated the show at the Walters Art Museum in Baltimore. So choice B is the answer.
- Option C: Claude Monet has been mentioned in para 3 as an example of an Impressionist who saw Edouard Manet as his hero. But choice C is not the answer to the question.

Option D: Choice D does not find a mention in the passage.  
Choice (B)

20. It can be inferred from the passage that Edouard Manet was born in 1832. He was 51 when he died in 1883. The first para tells us: Throughout his life, but especially toward its end in 1883, ..... The second para tells us: He was 51 when he died .....  
 (i) The Masterpiece (*L'Oeuvre*) is not a work of Manet. It is a novel by Emile Zola.  
 (ii) It has been mentioned in para 5 that "A Bar at the Folies Bergere" was a great painting by Manet in the final years of his life. Hence (ii) is an answer to the question.  
 (iii) And flowers: many of them exquisite little watercolors (a briar rose, a snail on a leaf) were done by Manet with rapid, sketchy delicacy, with notes to their recipients, mainly his women friends. Also in para 6, we are told: In his larger oils of flowers, often painted from bouquets that friends had brought him in his illness, there are darker notes... Hence (iii) is also an answer to the question.  
 (iv) Though Olympia and Le Dejeuner sur l'Herbe are great paintings of Manet, we are not told in the passage that Manet painted it in the final years of his life.  
 (v) Still Life with Salmon was made by Manet in 1866 and not in the final years of his life.  
 Hence (ii) and (iii) apply.

Choice (C)

21. Refer to para 2. Manet's paintings rarely sold (luckily, he had some money of his own).  
 Option A: Choice A can be clearly concluded from the passage.  
 Option B: Choice B finds no basis in the passage.  
 Option C: Choice C is incorrect as we cannot tell if the money he had was an inheritance or from some other source of income.  
 Option D: Choice D is out of scope and extreme in tone.

Choice (A)

22. Refer to para 5. His love of life and of style was too strong. In their sweet, private brevity, ***these tiny notes combining script and image*** are among the most "Japanese" images to come out of a time when japonisme was all the rage--and all the more authentically so for not copying Japanese mannerisms. From this we can say that choice A is correct. Choice B (specific French style) is not correct. Choice C sounds farfetched.

Choice (A)

23. It can be inferred that Choice D has all pairs correctly matched.  
 The correct pairs are a – iii, b – v, c – i, d – ii, e – iv

Choice (D)

24. Statement 1: From para 7, we know that Manet paid attention to Spanish painters Velazquez, Goya, Sanchez and the French master of still life, Chardin. But Charles Ephrussi was a collector to whom Manet's painting *The Bunch of Asparagus* was sold. Hence Statement 1 is not true.

Statement 2: The first half of choice B is out of scope. But the second half of choice B is false from "lion of early modernism" (para 1) and "Olympia and Le Dejeuner sur l'Herbe, which today are among the unquestioned masterpieces of the 19th century and are seen by many as the twin pillars that mark and hold up the entrance to modernism" (para 2). Hence Statement 2 is not true.

Statement 3: While Charles Baudelaire was Manet's friend, Emile Zola was not a loyalist. Refer to paragraph 3: ..... he changed his mind and called Manet "not a very great painter ..... an incomplete talent." Hence Statement 3 is not true.

Statement 4: And what did he paint as expressive consolation to himself during those final years? One last great painting, of a terminally bored barmaid surrounded by a maze of mirror reflections, A Bar at the Folies

Bergere. And flowers: many of them exquisite little watercolors ..... Hence Statement 4 is true.

Statement 5: Statement 5 can be deduced from the first sentence of para 6: In his larger oils of flowers, often painted from bouquets that friends had brought him in his illness, there are darker notes--sometimes literally so, in the enveloping blackness of their backgrounds, against which the voluptuous white petals of a peony stand out like the skirts of a dying ballerina. Hence Statement 5 is true. Para 6 says that the backgrounds of his paintings portray darkness closing in.

Ans: (45)

Difficulty level wise summary - Section I	
Sub Section: RC	
Level of Difficulty	Questions
Very Easy	19
Easy	4, 21, 22
Medium	1, 3, 5, 6, 7, 8, 10, 14, 16, 17, 18, 20, 23
Difficult	2, 9, 11, 12, 13, 15, 24
Very Difficult	-

## SUB-SECTION: VA

### Solutions for questions 1 to 5:

1. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the paragraph. It introduces the topic of discussion: A restaurant that served a fantastic clam chowder was packed with customers at lunchtime. Sentence 4 is followed by sentence 2. A new owner bought the business but he watered down the chowder. Sentence 5 talks about the consequences of "watering down the chowder" which has been mentioned in sentence 2 – profits increased but customers began to disappear. Sentences 5 and 1 form a mandatory pair. "little by little, the customers began to disappear" in sentence 5 links with "Trust was gone, and business dwindled to almost nothing ....." in sentence 1. "no more goose to produce the golden egg" in sentence 1 links with "the new owner focussed on golden eggs" mentioned earlier in sentence 2. Sentence 3 (The new owner tried desperately to reclaim the business ..... lost the asset of customer loyalty) concludes the paragraph. Hence, 42513.

Ans: (42513)

2. On a careful reading of the sentences, it can be observed that sentence 5 introduces the topic of discussion. The author wanted to buy a token for a ride in the New York subway. Sentences 5 and 1 form a mandatory pair. "it (turnstile) had been purposely jammed" in sentence 5 links with "having disabled the turnstiles" in sentence 1. Sentence 1 is followed by sentence 4. "one of his cohorts (had his mouth on the coin slots, sucking out the jammed coins and leaving his slobber)" in sentence 4 points to "scruffy-looking character who was now demanding that riders give him their tokens" in sentence 1. Sentence 3 follows sentence 4. "Most people were too intimidated to take these guys on" in sentence 3 will follow the events mentioned in sentences 1 and 4. Sentence 2 is an opinionated statement that concludes the paragraph. So, 51432.

Ans: (51432)

3. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the paragraph. It states the topic of discussion: We do owe something to parentage and patronage. Sentences 2 and 5 form a mandatory pair. "we do owe something to parentage and patronage" in sentence 2 links with "The culture we belong to and the legacies passed down by our forebears" in sentence 5. Sentence 4 follows sentence 5. "may look like they did it all by themselves" in sentence 4 contrasts "shape the patterns of our achievements in ways we cannot begin to imagine" in sentence 5. Sentence 1 follows sentence 4 with the contrast conjunction 'but'. The pronoun 'they' in sentence 1 points to "The people who stand before kings"

mentioned in sentence 4. Also "beneficiaries of hidden advantages and extraordinary opportunities and cultural legacies" in sentence 1 links with "parentage and patronage" in sentence 2 and "The culture we belong to and the legacies passed down by our forebears" in sentence 5. "allow them to learn and work hard and make sense of the world in ways others cannot" in sentence 1 stresses "shape the patterns of our achievements in ways we cannot begin to imagine" mentioned earlier in sentence 5. Sentence 3 concludes the paragraph. So, 25413.

Ans: (25413)

4. On a careful reading of the sentences, it can be observed that sentence 1 is a general sentence which begins the paragraph. It introduces the fourth level of one's personality – attitude. Sentence 1 and sentence 3 form a mandatory pair. "attitude" in sentence 1 links with "your attitude" in sentence 3. Sentences 3 and 4 form a mandatory pair. "reflection of your values, beliefs and expectations" in sentence 3 links with "if your value is that this is a good world to live in and your belief is that you are going to be very successful in life, you will expect that ...." in sentence 2. Sentence 5 follows sentence 2 as sentence 5 highlights the outward manifestation or reflection (you will have a positive mental attitude towards other people and they will respond positively towards you ....) of one's values, beliefs and expectations mentioned earlier in sentence 3. Sentences 5 and 4 form a mandatory pair. "helping you to be more successful" in sentence 5 links with ".... goes hand in hand with great success in every walk of life" in sentence 4. Sentence 4 brings the para to a close. So, 13254.

Ans: (13254)

5. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence which begins the paragraph. It has the date and the proper noun (person's name "Stanley Milgram") and the objective of the experiment: to find an answer to what is known as the small-world problem. Sentences 3 and 5 form a mandatory pair. "small-world problem" in sentence 3 links with "The problem is this: how are human beings connected?" in sentence 5. The question in sentence 5 links with the question posed in sentence 2. "Do we all belong to separate worlds, with few and distant links between any two people?" in sentence 2 primarily seeks to address the problem "how are human beings connected?" posed as a question in sentence 5. Sentence 4 is another question extension of the thought mentioned in sentence 2. Sentence 1 rephrases the problem question under discussion and concludes the paragraph with a summary (In a way ....). So, 35241.

Ans: (35241)

#### Solutions for questions 6 and 7:

6. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that opens the paragraph with a question. Sentence 5 follows sentence 3. "a bird's singing helps one to do both" in sentence 5 links with "nightingale's song help you pass an exam or a blackbird's twittering encourage you to open a bank account" in sentence 3. Sentence 1 follows sentence 5. "They argue" in sentence 1 refers to "sound experts claim" in sentence 5. Also "positive results speak for themselves" in sentence 1 links with "bird's singing helps one to do both" in sentence 5. Sentence 4 concludes the paragraph. "Most support for the theory is anecdotal" in sentence 4 links with "there is little hard scientific evidence to show that people respond positively to birds singing" in sentence 1. So, 3514. Sentence 2 is the odd sentence out as it will need further elaboration or substantiation. It talks about 'noise' and not of how birdsongs make it easier to focus. Ans: (2)
7. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the paragraph. The Great Wall of China built by the Ming

Dynasty is introduced in this sentence. Sentence 2 follows sentence 4. "the Great Wall of China as we know it today was brought to fruition" in sentence 4 links with "The building of the Great Wall took a long time" in sentence 2. Sentences 2 and 1 form a mandatory pair. "substantial additions were made to the wall" in sentence 2 links with "not only did the dynasty add length, it also added double and triple walls in some place" in sentence 1. And "the Ming Dynasty had to contend with a great number of attacks by minority tribes" in sentence 2 links with "reinforce previously built structures and confuse attackers" in sentence 1. Sentence 5 concludes the paragraph. "the wall is wide enough" in sentence 5 points to "complexity and sheer size of the Ming wall" in sentence 1. So, 4215. Sentence 3 is the odd sentence out as " If that were true" in sentence 3 needs a precedent.

Ans: (3)

#### Solutions for questions 8 to 10:

8. The word 'say' will fit in sentences (i), (iii) and (iv). The word 'portray' does not fit in any of the sentences. The word 'support' fits in sentence (v). The word 'predict' fits in sentences (ii), (iii) and (iv). The word 'predict' will not fit in sentence (i) – someone would not predict that they're looking ahead. Since the word 'predict' and 'say' fit in a maximum of three sentences, the correct answer is 3.
- Ans: (3)
9. The words 'Mandatory' and 'regulated' do not fit in any of the sentences, while the word 'prescription' fits in only sentence (ii). 'Mandate' fits sentences (i), (iv) and (v). Therefore the maximum number of sentences that any word can fill is 3.
- Ans: (3)
10. The word 'tractable' will fit in sentences (i), (ii), (iii) and (iv). The word 'kind' does not fit in sentences (iii) and (iv). The word 'calm' does not fit in sentence (ii). The word 'gentle' does not fit in sentence (iii). Since the word 'tractable' fits in a maximum of four sentences, the correct answer is 4.
- Ans: (4)

Difficulty level wise summary - Section I	
Sub Section: VA	
Level of Difficulty	Questions
Very Easy	-
Easy	7
Medium	6, 8, 9, 10
Difficult	1, 2, 4
Very Difficult	3, 5

## SECTION – II SUB-SECTION: DI

#### Solutions for questions 1 to 4:

1. The highest percentage increase in the number of vehicles sold is for Landmaster.
- $$\text{Percentage increase} = \frac{20 - 16.5}{16.5} = 21.2\%$$
- Choice (C)
2. Total number of vehicles sold by the ten companies in 2014 = 148000  
 Total number of vehicles sold by the ten companies in 2015 = 168500  

$$\text{Percentage increase} = \frac{168500 - 148000}{148000} = 13.85\%$$

Choice (D)

3. Average price of a vehicle in 2014  

$$= \frac{220\text{bn}}{148000} = 1500000$$
  
 Average price of a vehicle in 2015

$$= \frac{421.25 \text{ bn}}{168500} = 2500000$$

$$\text{Percentage increase} = \frac{10}{15} = 66.67\%$$

Choice (A)

4. Since the percentage increase from 2013 to 2014 is the same as that from 2014 to 2015, the number of trucks sold by any company in 2013

$$= \frac{\text{Trucks sold in 2014}}{\text{Trucks sold in 2015}} \times (\text{Trucks sold in 2014})$$

We can arrive at the following table with the number of vehicles sold by the ten companies in 2013, 2014 and 2015:

Company	2013	2014	2015
Delorean	12.5	15.0	18.0
Spinner	8.7	10.0	11.5
Supercar	10.8	12.5	14.5
Speeder	14.5	15.0	15.5
Herbie	18.0	18.5	19.0
Truckster	10.4	12.5	15.0
Ecto	12.1	13.0	14.0
Light Cycle	14.3	16.5	19.0
Bluesmobile	15.6	18.5	22.0
Landmaster	13.6	16.5	20.0

The total number of vehicles sold in 2013 = 130500  
Choice (B)

#### Solutions for questions 5 to 8:

5. Four blocks out of twenty passed the quality inspection.  
Required percentage = 20%. Ans: (20)
6. The maximum number of blocks failed the inspection of Logo.  
Choice (D)
7. The maximum number of blocks that failed the quality inspection  
Option A: on the parameter 'Width' belonged to Lot 2. Hence, this is false.  
Option B: on the parameter 'Length' belonged to Lot 1. Hence, this is false.  
Option C: on the parameter 'Finish' belonged to Lot 1. Hence, this is true.  
Option D: on the parameter 'Logo' belonged to Lot 1. Hence, this is false. Choice (C)
8. 13 blocks failed the quality inspection in exactly one parameter among Weight, Breadth and Finish. Of these 13, 2 blocks failed quality inspection in all three parameters among Length, Colour and Logo. Hence, a total of 11 blocks satisfy the given condition (the blocks are 2AA23, 3SD34, 1CB43, 4FF32, 4JF05, 9JS37, 0KS93, 1IW91, 3OD94, 2SS48 and 1SD29).  
Ans: (11)

#### Solutions for questions 9 to 12:

9. By observation, we can see that for all three cars to have a tyre pressure of more than 16 kmpl, the tyre pressure must be in the range of 31 to 34 PSI. Between 32-34 PSI, all three cars have a top speed greater than 200 kmph. From the given options, only option A satisfies.  
Choice (A)
10. According to the question, the top speed must be 220 kmph and the mileage must be at least 25 kmpl.  
Option A: For this combination, the top speed is 234 kmph and the mileage is 14 kmpl. Hence, this option does not satisfy.

Option B: For this combination, the top speed is 210 kmph and the mileage is 29 kmpl. Hence, this option does not satisfy.

Option C: For this combination, the top speed is 222 kmph and the mileage is 11 kmpl. Hence, this option does not satisfy.

Option D: For this combination, the top speed is 220 kmph and mileage is 25 kmpl. Hence, this option satisfies.  
Choice (D)

11. The top speed of Kobra must be at least 215 kmph. This condition is satisfied for a tyre pressure in the range of 26-28 PSI and  $33\frac{1}{6}$ -40 PSI. The highest mileage in the range of 26-28 PSI is 21 kmpl. The mileage at  $33\frac{1}{6}$  is 23.5 kmpl. To travel  $215 \times 2 = 430$  km, he would need at least  $430/23.5 = 18.3$  liters of fuel.  
Choice (A)
12. For King, the tyre pressure can be in the range of 34-39 PSI and the top speed will be 230 kmph.  
For Kobra, the tyre pressure can be in the range of 28-35 PSI and the top speed will be 220 kmph.  
For Kong, the tyre pressure can be in the range of 30-33 PSI and the top speed will be 204 kmph.  
Hence, the highest speed that he can reach is 230 kmph.  
Ans: (230)

#### Solutions for questions 13 to 16:

13. The Raw Material cost as a percentage of the Total Cost of Manufacturing is greater than 50% for 2013 and 2014. For 2013, the percentage is 53.85% and for 2014, the percentage is 51.15%. hence, the answer is 53.85%.  
Choice (C)
14. If the percentage of Raw Material cost is less than 50%, Other Overheads will be greater than 50%. This condition is satisfied for 5 years (2009, 2010, 2011, 2012, 2015).  
Ans: (5)

15. The following table gives the Other Overheads and the percentage increase

Year	Other Overheads	Percentage Increase
2008	60	-
2009	67	11.67%
2010	76	13.43%
2011	81	6.58%
2012	85	4.94%
2013	72	-15.29%
2014	85	18.06%
2015	96	12.94%

The highest percentage increase is 18.06%.

Choice (D)

16. The Total Cost of Manufacturing in 2016 will be 209 and the Raw Material Cost will be 104.5.  
Percentage increase =  $\frac{10.5}{94} = 11.17\%$  Choice (D)

Difficulty level wise summary - Section II	
Sub Section: DI	
Level of Difficulty	Questions
Very Easy	-
Easy	1, 2, 3, 4, 5, 6, 9, 10, 13, 14, 15, 16
Medium	7, 8, 11, 12
Difficult	-
Very Difficult	-

## SUB-SECTION: LR

### Solutions for questions 1 to 4:

From (ii), (iii), (iv) and (v), Himesh, Amar, Bob or Devon cannot be standing at the extreme right. Hence, Carl has to be at the extreme right and Sravan will be behind Carl. Utsav cannot be second from right (since he cannot be standing next to Sravan from (v)). Utsav cannot be at the extreme left (since his son is to the right of Devon).

If Utsav is second from left, Devon will be at the extreme left. From (i), Pavan is to the right of Ramesh. Since Ramesh cannot be at the extreme left (from (iii)), Ramesh and Pavan will be third and fourth from left respectively. Tarak will be at the extreme left. Neither Himesh nor Amar can be standing in front of Pavan. Hence, Bob will be in front of Pavan. Himesh will be in front of Ramesh and Amar will be in front of Utsav. If Utsav is third from left, Devon will be second from left. Ramesh and Pavan can only be second from left and fourth from left. Tarak will be at the extreme left. Only Bob can be standing in front of Pavan. Himesh will be in front of Utsav and Amar will be in front of Tarak.

The following table presents the two possibilities:

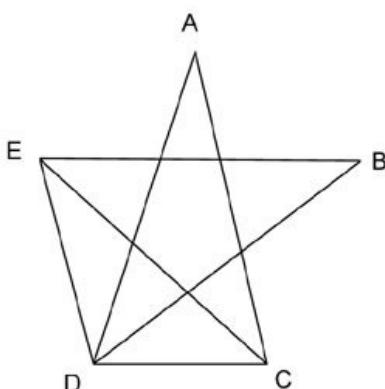
<b>Case 1</b>	Devon	Amar	Himesh	Bob	Carl
	Tarak	Utsav	Ramesh	Pavan	Sravan
<b>Case 2</b>	Amar	Devon	Himesh	Bob	Carl
	Tarak	Ramesh	Utsav	Pavan	Sravan

1. Pavan is the father of Bob. Choice (A)
2. Tarak is definitely to the left of Utsav. Choice (C)
3. Either Amar or Himesh can be the son if Utsav. Hence, the answer cannot be determined. Choice (D)
4. If Ramesh is in the middle, Devon is the son of Tarak. Choice (B)

### Solutions for questions 5 to 8:

Given that A, B, C, D and E form a regular pentagon. If all the possible routes are drawn, there will be ten routes in total (five sides and five diagonals). From (ii), seven routes are present (of the possible ten). Hence, 3 routes must be missing. Of these three missing routes, two are from City A (from (i)). Third one is from City C. Since City C is connected to City A (from (iv)) and City D is also connected to A (from (iii)), City A must not be connected to City E and City B. Since City E is not connected to City A, it must be connected to all the other cities.

The following network can be drawn using the above information:



5. Both City C and City D are connected to City A. Choice (D)

6. City B can be reached from City A through City D. Hence, a person has to pass through one city to reach City B from City A. Ans: (1)

7. The following routes are possible from City B to City C: BEC, BEDC, BEDAC, BDC, BDEC, BDAC. Hence, this is possible in 6 ways. Ans: (6)

8. Two cities are connected to City B. Choice (B)

### Solutions for questions 9 to 12:

9. If  $n = 10$ , the fifteen children will have 10, 11, 12... 24 marbles. In the first round, A will give a marble to B. B will give a marble to C (since B has 12 marbles after receiving a marble from A). C and D will have 13 marbles and will not give any marbles. E, F will give marbles to the next child. But G and H will have 17 marbles and will not give any marbles. Similarly, M and N will not give any marbles to their neighbours. Hence, a total of 6 children will skip their turn. Ans: (6)

10. From the above solution, we can observe that children skipping their turns happens in pairs (prime – 1 and prime), i.e., the number of children skipping their turn in the first round will be an even number, unless the first child has a prime number of marbles. If 5 people skip their turn, then  $n$  must be a prime number. From the options,  $n$  can be 61 or 2.

If  $n$  is 61, A will not give any marbles. Similarly, the children who had 66 marbles and 67 marbles also will skip their turn (since the child with 66 marbles will end up with 67 marbles after the previous child gives him a marble). Also, the children with 70 and 71 marbles also will skip their turn. But the child with 73 marbles will receive a marble from the previous child and will give one to the next child. Hence, a total of five children will skip their turn in this case.

If  $n$  is 2, A and B will skip their turns. The children with 6, 7, 10 and 11 marbles will also skip their turns. Hence, a total of 6 children will skip their turns.

Therefore,  $n$  can only be 61. Choice (B)

11. The following table give the number of marbles with each child at the end of each round:

Child	Initial	Round 1	Round 2	Round 3
A	8	7	8	8
B	9	9	8	8
C	10	11	11	11
D	11	11	11	11
E	12	11	11	11
F	13	13	13	13
G	14	14	14	14
H	15	15	15	15
I	16	17	17	17
J	17	17	17	17
K	18	17	17	17
L	19	19	19	19
M	20	20	20	20
N	21	21	21	21
O	22	23	23	23

Note that A will not receive a marble from O in the first round since O will end up with 23 marbles. Also, the number of marbles will not change after the second round for any number of rounds. Further, from the second round onwards, no child will skip their turn. Hence, I will have 17 marbles after six rounds.

#### Alternative Solution:

I will initially have 16 marbles (since he is the ninth person). The person before him, H, will have 15 marbles. Irrespective of whether H receives a marble or not, H will give a marble to I (since H will have either 15 or 16 marbles, both of which are not prime). Hence, I will have

17 marbles at the end of the first round. From the second round onwards, I will always have 17 marbles – if he receives a marble, he will have 18 marbles and will give one marble to the next person, ending up with 17 marbles and if he does not receive a marble, he will not give any marble to the next person. Hence, I will always have 17 marbles.

Ans: (17)

12. Let  $n, n + 1 \dots n + 14$  be the number of marble with the children.

Given that  $15n + 1 + 2 + 3 + \dots + 14 = 345 \Rightarrow n = 16$

If  $n$  is 16, the number of marbles with the children after the end of the first round will be:

16, 17, 19, 19, 19, 21, 23, 23, 23, 25, 26, 27, 29, 29, 29.

Hence, a total of 10 children will have a prime number of marbles.

Ans: (10)

### Solutions for questions 13 to 16:

Given that Bell speaks English, Charles speaks Chinese, Daniel speak Hindi, Evan speaks French. Since Charles speaks Chinese, and Charles can discuss with Abbott (from (i)) or Evan (from (iv)), one among Abbott and Evan must speak Chinese.

If Evan speaks Chinese, Bell must have a language common with Evan. This cannot be Chinese since two people already speak Chinese. Hence, Bell must speak French. Daniel cannot speak English (from (v)), French or Chinese (spoken by two persons). Hence, he has to speak Russian. Abbott must speak any two languages among Russian, English and Hindi. Charles must speak the third language. In any of these cases, Abbott and Charles will not have a language in common. Hence, this case is not possible.

If Abbott speak Chinese, Charles and Evans must have a language in common. This language can be either Russian (since that is the only language that no one else speaks) or French. It cannot be Chinese as two people (Abbott and Charles) already speak Chinese. If Charles and Evans speak Russian, Bell must speak French (to have a language in common with Evan). Abbott must speak either French or Russian to have a language in common with Evan. But both these languages are already spoken by two persons each. Hence, Charles and Evans cannot have Russian as the common language. If they have French as the common language, Daniel must speak Russian (since French, Chinese are spoken by two people and he does not speak English). Now, Evan and Bell must have a language in common. This can only be English. Hence, Evan speaks English. Abbott and Bell can speak Russian or Hindi as their other language.

The following table presents both the cases:

Person	Language 1	Language 2
Abbott	Chinese	Russian/Hindi
Bell	English	Hindi/Russian
Charles	Chinese	French
Daniel	Hindi	Russian
Evan	French	English

13. Either Bell or Abbott speaks Hindi. Choice (D)
14. Daniel can discuss his ideas with Abbott. Choice (A)
15. Charles speaks French. Choice (B)
16. Only option B is definitely true. Choice (B)

Difficulty level wise summary - Section II	
Sub Section: LR	
Level of Difficulty	Questions
Very Easy	–
Easy	1, 2, 3, 4, 5, 6, 8
Medium	7, 9, 12
Difficult	10, 11, 13, 14, 15, 16
Very Difficult	–

### SECTION – III: QA

#### Solutions for questions 1 to 34:

1. Let the cost of a pen be  $24k$

∴ the cost of an eraser =  $2k$

∴ the cost of a pencil =  $3k$

It is given that,  $2(24k) - 5(3k) = 33k = 33$

∴  $k = 1$

∴ The cost of one pen, two pencils and three erasers =  $24k + 2(3k) + 3(2k) = 36k = ₹36$

Choice (B)

2.  $OB = OD = 65$  (Given)

$$\text{In } \triangleOND, ND = \frac{1}{2}(120) = 60$$

$$\therefore ON = \sqrt{65^2 - 60^2} = 25$$

$$\text{In } \triangleOMB, MB = \frac{1}{2}(108) = 54$$

$$\therefore OM = \sqrt{65^2 - 54^2} = 39$$

Thus the distance between the two chords is  $25 + 39 = 64$ . Choice (D)

3. Let us denote the number of parrots and mainas by  $5k$  and  $8k$  respectively.

$$\text{Now, } \frac{5k+21}{8k+21} = \frac{4}{5}$$

$$\Rightarrow 7k = 21$$

$$\therefore k = 3$$

The total number of parrots and mainas in the canary =  $13k = 13(3) = 39$  Choice (B)

4. Let  $S = 2 + 6 + 12 + 20 + 30 + \dots = 2(1 + 3 + 6 + 10 + 15 + \dots)$

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

$$\therefore S_n = \sum n(n+1) = 1 \sum n^2 + 1 \sum n$$

$$= \frac{n(n+1)(2n+1)}{6} + \frac{n(n+1)}{2}$$

$$\therefore S_{30} = \frac{(30)(31)(61)}{6} + \frac{(30)(31)}{2}$$

$$= 9920$$

Ans: (9920)

5. Let us compare  $2^{\frac{1}{3}}, 3^{\frac{1}{4}}$ , and  $5^{\frac{1}{6}}$

Raising all the number to the power of 12, we get.

$$\left(\frac{1}{2^3}\right)^{12} = 2^4 = 16, \quad \left(\frac{1}{3^4}\right)^{12} = 3^3 = 27 \quad \text{and}$$

$$\left(\frac{1}{5^6}\right)^{12} = 5^2 = 25.$$

As  $27 > 25 > 16$ , so  $3^{\frac{1}{4}} > 5^{\frac{1}{6}} > 2^{\frac{1}{3}}$

Now, we compare  $3^{\frac{1}{4}}$  and  $4^{\frac{1}{5}}$ .

Raising both to the power of 20, we get

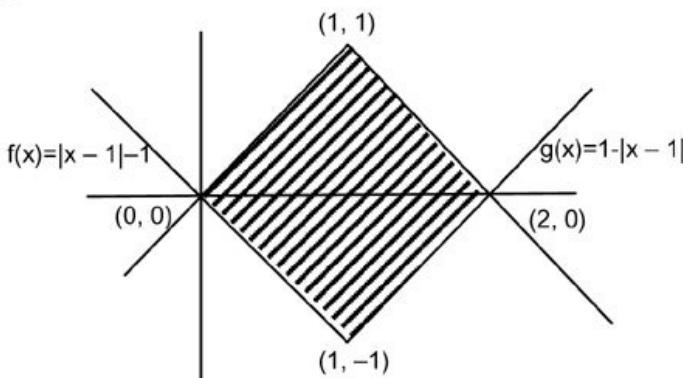
$$(3^{\frac{1}{4}})^{20} = 3^5 = 243 \text{ and } (4^{\frac{1}{5}})^{20} = 4^4 = 256.$$

As  $256 > 243$ , so  $4^{\frac{1}{5}} > 3^{\frac{1}{4}}$

$$\therefore c > b > d > a$$

Choice (B)

6.



The two curves have been plotted above. Their points of intersection is  $(0, 0)$  and  $(2, 0)$ . The area enclosed between the two curves is the shaded area shown above

$$= 2 \left[ \frac{1}{2} \times 2 \times 1 \right] = 2 \text{ sq. units.}$$

Ans: (2)

7. A leap year consists of 366 days

$$366 = 7(52) + 2$$

i.e., each day occurs 52 times and only 2 of the seven days occur 53 times

Now, the two extra days can be as follows:

1. Sunday, Monday
2. Monday, Tuesday
3. Tuesday, Wednesday
4. Wednesday, Thursday
5. Thursday, Friday
6. Friday, Saturday
7. Saturday, Sunday

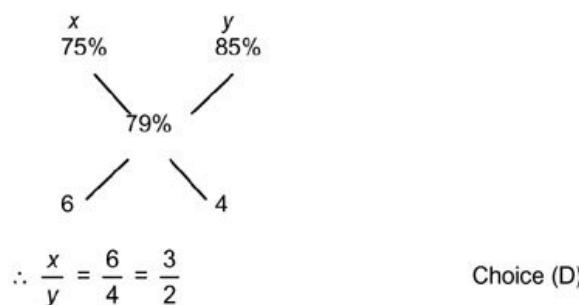
Therefore, the probability that a leap year consists of 52 Sundays will be all the above listed cases except the first

$$\text{and last one i.e., } \frac{5}{7}$$

Choice (C)

8. Let the quantities of the two detergents A and B mixed by  $x$  and  $y$  respectively

Using Alligation, we get



Choice (D)

9. Let us denote the total distance, the uphill distance and the downhill distance by  $d$ ,  $x$  and  $y$  respectively.

The distance covered on level ground =  $d - (x + y)$

$$\text{On his onward journey, } \frac{x}{40} + \frac{d - (x + y)}{48} + \frac{y}{60} = 3$$

$$\text{On his return journey, } \frac{x}{60} + \frac{d - (x + y)}{48} + \frac{y}{40} = 3\frac{2}{3}$$

Adding the two equations, we get

$$\left( \frac{x}{40} + \frac{x}{60} \right) + \frac{2d}{48} - \frac{2(x+y)}{48} + \left( \frac{y}{40} + \frac{y}{60} \right) = 6\frac{2}{3}$$

$$\Rightarrow \frac{x}{24} + \frac{d}{24} - \frac{x}{24} - \frac{y}{24} + \frac{y}{24} = \frac{20}{3}$$

$$\Rightarrow \frac{d}{24} = \frac{20}{3} \Rightarrow d = 160 \text{ km.}$$

Choice (B)

10. Considering the seven consecutive numbers as  $a - 3, a - 2, a - 1, a, a + 1, a + 2$  and  $a + 3$ , we get a sum of  $7a$ . Similarly if we consider the numbers as  $b - 4, b - 3, b - 2, b - 1, b, b + 1, b + 2, b + 3$  and  $b + 4$ , we get a sum of  $9b$ . It is given that  $7a = 9b = 63k$ . A number of this form can be expressed as the sum of 7 consecutive numbers or 9 consecutive numbers. The minimum value will be obtained for  $k = 1$ , i.e., 63.

Ans: (63)

11. We know that any number of the form ABCABC is divisible by 1001, since  $ABC \times 1001 = ABCABC$ . Hence, ABCABC when repeated an integral number of times (i.e., number of digits being a multiple of 6) will also be divisible by 1001. Since 123123..... upto 300 digits is given, and 300 is a multiple of 6, the required remainder will be zero.

Ans: (0)

$$\begin{aligned} x^3 - 1 &< x^2 - x \\ x^3 - 1 - x^2 + x &< 0 \\ (x-1)(x^2+1) &< 0 \\ \text{As } x^2 + 1 \text{ is always positive for real values of } x. \\ \therefore x-1 &< 0 \\ \Rightarrow x &< 1 \end{aligned}$$

Therefore the range of  $x$  is  $(-\infty, 1)$

#### Alternative Solution:

Let  $x = 0$ , options (C) and (D) are eliminated. Let  $x = -4$ , option (B) is eliminated. Hence option (A).

Choice (A)

13. Let the distance under consideration, the speed of the boat in still water and the speed of the stream be  $d$ ,  $u$  and  $v$  respectively.

$$\text{Time taken to travel upstream} = \frac{d}{u-v}$$

$$\text{Time taken to travel downstream} = \frac{d}{u+v}$$

$$\text{It is given that } \frac{d}{u-v} = \frac{3}{2} \left( \frac{d}{u+v} \right)$$

$$2(u+v) = 3(u-v)$$

$$u = 5v.$$

$$\text{Speed of the boat upstream} = u - v = 5v - v = 4v$$

Therefore the speed of the boat upstream is four times the speed of the stream.

Choice (A)

14. Let us denote the two numbers as  $8a + 2$  and  $5b + 4$  respectively.

It is given that,  $8a + 2 + 5b + 4 = 144$

$$\Rightarrow 8a + 5b = 138$$

substituting  $a = 1$ , we get  $b = 26$ .

Again, we know that successive values of  $a$  and  $b$  will change as per the coefficients of  $b$  and  $a$  respectively.

Applying this, we get the following solutions for  $a$  and  $b$

$a$	1	6	11	16
$b$	26	18	10	2

Therefore the numbers are  $8a + 2$  and  $5b + 4$

i.e.,  $(10, 130), (50, 94), (90, 44)$  and  $(130, 14)$ .

Thus we get a total of 4 ways

Ans: (4)

15. Let the number of votes polled in favour of B be denoted by  $2k$ .

Let us tabulate the number of votes polled in favour of the two candidates and the majority by which A won in the two following cases

	A	B	Majority by which A wins
Case I	$12000 - 2k$	$2k$	$12000 - 4k$
Case II	$12000 - k$	$k$	$12000 - 2k$

It is given that,

$$12000 - 2k = 1.5 (12000 - 4k)$$

$$\Rightarrow 24000 - 4k = 36000 - 12k$$

$$\Rightarrow k = 1500$$

$$\text{Number of votes cast in favour of B} = 2k = 3000$$

#### Alternative Solution:

We could approach the question using the answer choices given:

Choice (A): If B = 3000, then A =  $12000 - 3000 = 9000$ . Had 50% of B's votes gone to A then A's majority would be 9000, which is 1.5 times the actual majority ( $9000 - 3000 = 6000$ ).

Hence, option (A) satisfies. Other choices need not be checked.

Choice (A)

16.  $(x - y)(x^2 + y^2) = 965 = 5(193)$   
 $(x + y)(x - y)(x + y) = 1805 = 5(19)(19)$

As x and y are positive integers, we get

$$x + y = 19 \text{ and}$$

$$x - y = 5$$

$$\text{solving, we get } x = 12 \text{ and } y = 7$$

$$\therefore xy = 84 \quad \text{Ans: (84)}$$

17. It is given that,

$$\sqrt{2x^2 - x + 36} + \sqrt{2x^2 - x - 36} = 36 \quad (1)$$

Now multiplying both sides by

$$\left( \sqrt{2x^2 - x + 36} - \sqrt{2x^2 - x - 36} \right) \quad \text{and simplifying,}$$

$$\text{we get } \sqrt{2x^2 - x + 36} - \sqrt{2x^2 - x - 36} = 2 \quad (2)$$

Adding eq: (1) and (2), we get

$$2\sqrt{2x^2 - x + 36} = 38$$

$$\sqrt{2x^2 - x + 36} = 19$$

Squaring both sides, we get

$$2x^2 - x + 36 = 361$$

$$2x^2 - x - 325 = 0$$

$$(x - 13)(2x + 25) = 0$$

$$\therefore x = 13 \text{ or } x = -\frac{25}{2}$$

As the number of members in the family cannot be -

$$\frac{25}{2}, \text{ the number of members in his family was } 13.$$

#### Alternative Solution:

As  $\sqrt{2x^2 - x + 36} + \sqrt{2x^2 - x - 36} = 36$ , we need to find two perfect squares say a and b. the difference between a and b is 72 and the sum of their square roots is 36.

$$\therefore \sqrt{a} + \sqrt{b} = 36 \text{ and } \sqrt{a} - \sqrt{b} = \frac{a - b}{\sqrt{a} + \sqrt{b}} = \frac{72}{36} = 2.$$

$$\text{Solving we get, } \sqrt{a} = 19 \text{ and } \sqrt{b} = 17$$

$$\text{Next, we take } \sqrt{2x^2 - x + 36} = 19 \text{ and solve for } x \text{ to obtain } x = 13 \quad \text{Ans: (13)}$$

18. Let the number of years that B served in the PSU by T.  
It is given that,

Pension  $\alpha \sqrt{T}$

Pension =  $K\sqrt{T}$  where k is a constant

A served for T + 8 years

Had A served for  $13\frac{1}{3}$  years more than B, then the ratio of their pension amounts would be

$$\frac{P_A}{P_B} = \frac{k\sqrt{T+13\frac{1}{3}}}{k\sqrt{T}} = \frac{11}{9}$$

$$\frac{T+13\frac{1}{3}}{T} = \frac{121}{81}$$

$$81T + \frac{40}{3} \times 81 = 121T$$

$$\Rightarrow T = 27 \text{ years}$$

Therefore A served 27 + 8 i.e., 35 years.

Choice (B)

19. Of the three angles one is  $90^\circ$  and the other two are complementary

Say,  $\angle A + \angle B = 90$  and  $\angle C = 90$

$$\text{Now, } \sin^2 A + \sin^2 B + \sin^2 C = \sin^2 A + \sin^2 (90 - B) + 1 = \sin^2 A + \cos^2 A + 1 = 1 + 1 = 2$$

Ans: (2)

20. We need to find the number of 5-digit hexadecimal numbers.

The maximum and minimum value of a hexadecimal number consisting of 5 digits is denoted by (F F F F F)<sub>16</sub> and (1 0 0 0 0)<sub>16</sub> respectively

$$(F F F F F)<sub>16</sub> = 16<sup>5</sup> - 1 = 2<sup>20</sup> - 1 and$$

$$(1 0 0 0 0)<sub>16</sub> = 16<sup>4</sup> = 2<sup>16</sup>$$

We evaluate  $2^{16} = 65536$  and

$$2^{20} - 1 = 1048575$$

If the population of the Country is P

$$\text{Max. value is } 1048575 - 65536 + 1 = 983040$$

#### Alternative Solution:

In decimal system, the number of, say, 3-digit numbers = 900, i.e.,  $(10 - 1) \times 10^{(3-1)}$ . Extrapolating this result, the number of 5-digit numbers in hexadecimal system =  $(16 - 1) \times 16^{(5-1)} = 15 \times 16^4 = 983040$ .

Ans: (983040)

21. Let the cost price of the television set be x. Selling price of the set, when 10% profit is made =  $1.1x$

Selling price of the set, when 25% profit is made =  $1.25x$

It is given that  $1.25x = 1.1x + 1200$

$$0.15x = 1200$$

$$\Rightarrow x = 8000$$

Choice (C)

22. Let the two digit number be denoted by ab

It is given that,

$$10a + b = 6(ab - ba) \text{ or } 10a + b = 6(ba - ab)$$

$$10a + b = 6[9(a - b)] \quad 10a + b = 6[9(b - a)]$$

$$10a + b = 54a - 54b$$

$$10a + b = 54b - 54a$$

$$55b = 44a$$

$$64a = 53b$$

$$\frac{b}{a} = \frac{4}{5}$$

$$\frac{a}{b} = \frac{53}{64} \text{ (not possible)}$$

Therefore, the number is ab i.e., 54 and the sum of its digits in 9.

#### Alternative Solution:

Given  $10a + b = 6 \times 9 |b - a|$ . Now,  $|b - a|$  will be a single-digit number.

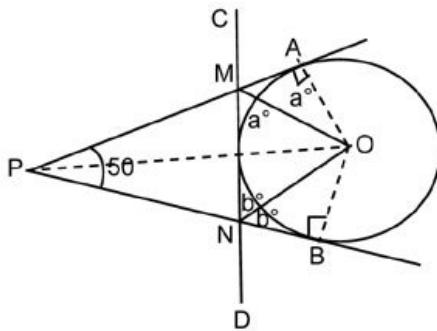
Further, since  $(10a + b)$  is a two-digit number, 54  $|b - a|$  must also be a two digit number.

That is,  $|b - a|$  can only be 1 and  $10b + a = 54 \times 1 = 54$ .

$$\text{Hence, } a + b = 5 + 4 = 9.$$

Choice (D)

23.



We join AO and BO

Now  $\angle AOB = 180 - 50 = 130^\circ$  [ $\because$  PADB is a quadrilateral]

As tangents are drawn from M and N to the circle.

$$\therefore \angle AMO = \angle NMO = a \text{ and } \angle MNO = \angle BNO = b$$

$$\therefore 2a + 2b + 90 + \angle AOB + 90 = 3(180) \text{ [sum of all the interior angles in a pentagon]}$$

$$2(a + b) + 130 = 360$$

$$\therefore a + b = 115$$

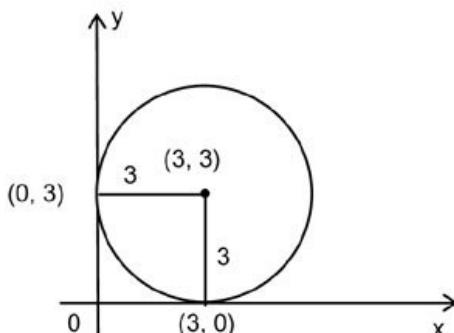
$$\begin{aligned} \text{In } \triangle MON, \angle MON &= 180 - (a + b) \\ &= 180 - (115) \\ &= 65^\circ \end{aligned}$$

**Alternative Solution:**

Imagine that the line MN is rotated (while still being tangential to the circle) such that the point Q coincides with B (i.e., M will then coincide with P and N with B). Then  $\angle MON$  will be equal to  $\angle POB = 90^\circ - \angle QPB = 90^\circ - 25^\circ = 65^\circ$ . Ans: (65)

24.  $723^{327} = (\underline{\quad} 3)^{4k+3} = (\underline{\quad} 3)^3 = \underline{\quad} 7$ .  
[ $\because 3^{4k}$  ends in 1 and  $327 = 4(81) + 3$ ] Choice (C)

25. Given the circle touches the coordinate axes at (3, 0) and (0, 3).



$\Rightarrow$  centre of the circle is (3, 3) and radius = 3 units.

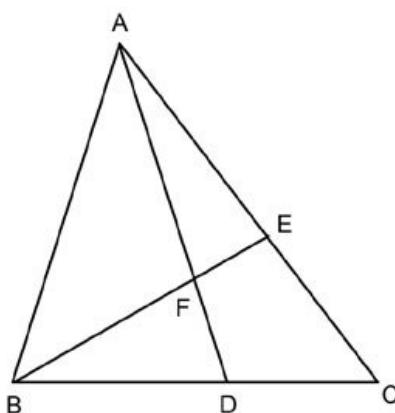
$\therefore$  Equation of the required circle is

$$(x - 3)^2 + (y - 3)^2 = 3^2$$

$$\text{i.e., } x^2 + y^2 - 6x - 6y + 9 = 0.$$

Choice (D)

26.

As  $BF : FE = 9 : 4$ 

$$\frac{\text{Area of } \triangle AFB}{\text{Area of } \triangle AFE} = \frac{BF}{FE} = \frac{9}{4}$$

[Both the triangles have equal height]

Let  $\triangle AFB = 9x$ 

$$\therefore \triangle AFE = 4x$$

$$\text{Similarly } \frac{AF}{FD} = \frac{\text{Area of } \triangle AFB}{\text{Area of } \triangle BFD} = \frac{3}{2} = \frac{9x}{6x}$$

$\therefore$  The area of triangles BFD and AFE are  $6x$  and  $4x$  respectively.

Thus the area of  $\triangle BFD$  is more than that of  $\triangle AFE$  by 50%

**Alternative Solution:**

Since  $\angle AFE = \angle BFD = \text{say, } x$  [vertically opposite angles], using the area formula  $\text{area} = \frac{1}{2}ab \sin C$ , we get

$$\triangle BFD = \frac{1}{2} (BF)(FD) \sin x \text{ and}$$

$$\triangle AFE = \frac{1}{2} (AF)(FE) \sin x.$$

$$\Rightarrow \frac{\triangle BFD}{\triangle AFE} = \left( \frac{BF}{FE} \right) \left( \frac{FD}{AF} \right) = \frac{9}{4} \times \frac{2}{3} = \frac{3}{2},$$

i.e.,  $\triangle BFD$  is 50% greater than  $\triangle AFE$ .

Choice (C)

27.

No. of factors

$$84 = 2^2 \times 3^1 \times 7^1 \quad 12$$

$$120 = 2^3 \times 3^1 \times 5^1 \quad 16$$

$$210 = 2^1 \times 3^1 \times 5^1 \times 7^1 \quad 16$$

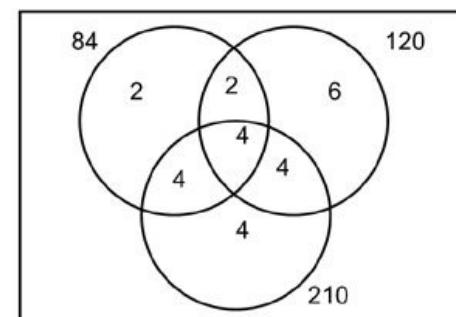
No. of factors

$$\text{HCF}(84, 120) = 2^2 \times 3^1 \quad 6$$

$$\text{HCF}(84, 210) = 2^1 \times 3^1 \times 7^1 \quad 8$$

$$\text{HCF}(120, 210) = 2^1 \times 3^1 \times 5^1 \quad 8$$

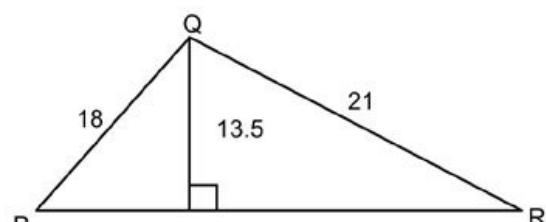
$$\text{HCF}(84, 120, 210) = 2^1 \times 3^1 \quad 4$$



Number of natural numbers which divide exactly two among 84, 120 and 210 are basically the number of common factors of exactly two of them which is  $2 + 4 + 4 = 10$ .

Choice (C)

28.



$$\text{Area of the } \triangle PQR = \frac{1}{2} (QR)(QM) = \frac{(18)(21)(QR)}{4R}$$

Where R = circumradius.

$$\Rightarrow R = 14.$$

$$\therefore \text{The area of the circumscribing circle} = \pi(R)^2$$

$$= \frac{22}{7} (14)^2 = 616 \text{ sq. units.}$$

Ans: (616)

29.  $(x+y+z)^2 \geq 0$   
 $\Rightarrow x^2 + y^2 + z^2 + 2(xy + yz + zx) \geq 0$   
 $\Rightarrow xy + yz + zx \geq -\frac{(x^2 + y^2 + z^2)}{2}$

$$\therefore xy + yz + zx \geq -2$$

Again  $(x-y)^2 + (y-z)^2 + (z-x)^2 \geq 0$   
 $2(x^2 + y^2 + z^2) - 2(xy + yz + zx) \geq 0$   
 $\Rightarrow xy + yz + zx \leq x^2 + y^2 + z^2$   
 $\Rightarrow xy + yz + zx \leq 4$

Therefore the range for  $xy + yz + zx$  is  $[-2, 4]$

**Alternative Solution:**

Let  $x = y = z = k$ .

$$\text{Then } 3k^2 = 4 \Rightarrow xy + yz + zx = 3k^2 = 4.$$

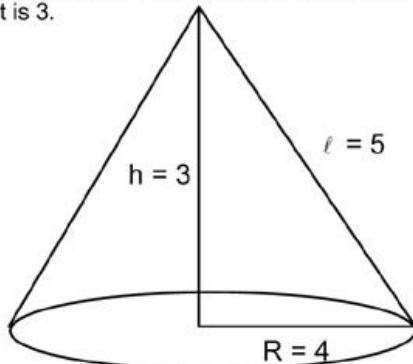
This eliminates choices (A) and (B).

Now let  $x = 0, y = \sqrt{2}$  and  $z = -\sqrt{2}$ , then  $xy + yz + zx = -2$ .

This eliminates choice (C). Hence, choice (D) must be the answer.

Choice (D)

30. The area of canvas required is equal to the curved surface area of the cone whose base radius is 4 and height is 3.



$$\text{The slant height, } l = \sqrt{3^2 + 4^2} = 5$$

$$\text{Therefore the curved surface area} = \pi r l = \frac{22}{7} (4) (5) \text{ m}^2$$

$$\text{Cost of canvas required} = \left(\frac{22}{7}\right) (4) (5) (140)$$

= ₹8800

Choice (C)

31. We use the fact that for any positive real numbers  $AM \geq GM$ .

$$\frac{a+b}{2} \geq \sqrt{ab}$$

$$\frac{b+c}{2} \geq \sqrt{bc}$$

$$\frac{a+c}{2} \geq \sqrt{ac}$$

Multiplying the inequalities given above, we get

$$\frac{(a+b)(b+c)(a+c)}{8} \geq abc$$

$$\therefore \frac{(a+b)(b+c)(c+a)}{abc} \geq 8$$

Therefore the minimum value is 8

**Alternative Solution:**

It can be inferred that the expression will achieve either a minimum or a maximum at  $a = b = c$ .

Substituting  $a = b = c$  in the expression gives 8. If  $a = 2, b = c = 1$ , we get 9. Hence, the minimum must be 8.

Ans: (8)

32.  $y^4 = (10^{60})^4 = 10^{240}$

Now, it is given that  $x^2 = y^4$

$$\Rightarrow (10^{48})^2 = 10^{240}$$

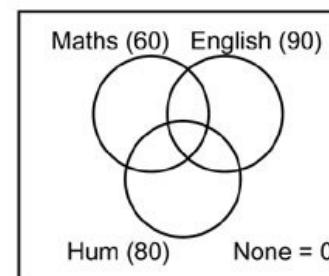
$$\therefore 48z = 240$$

$$\Rightarrow z = 5$$

Choice (B)

33. Let the number of students who passed in exactly one, exactly two and exactly three subjects be  $a, b$  and  $c$  respectively.

$$\text{Total} = 120$$



$$a + b + c = 120$$

$$a + 2b + 3c = 60 + 90 + 80$$

$$\text{Subtracting } b + 2c = 110 \quad \underline{\underline{\quad}} \quad (1)$$

$$\text{It is given that, } a + b + c = \frac{5}{4}(b + c)$$

$$120 = \frac{5}{4}(b + c)$$

$$\therefore b + c = 96 \quad \underline{\underline{\quad}} \quad (2)$$

Solving (1) and (2), we get  $c = 14$

Ans: (14)

34. To find the sum of the coefficient of all the terms in  $(1 + 3x + 2x^2)^4$ , we substitute  $x = 1$  to get  $6^4 = 1296$

Ans: (1296)

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