

**(Key and Solutions for AIMCAT1718)**

**Key**

**SECTION – I**

1. B	8. C	15. D	22. A	29. 4215
2. D	9. B	16. D	23. D	30. 4
3. B	10. C	17. C	24. C	31. 5
4. A	11. B	18. B	25. 3542	32. 1
5. C	12. D	19. C	26. 5413	33. B
6. D	13. C	20. B	27. 2413	34. D
7. A	14. D	21. D	28. 3251	

**SECTION – II**

1. 2	8. A	15. A	22. A	29. A
2. 42000	9. B	16. D	23. B	30. B
3. D	10. D	17. A	24. 4	31. B
4. B	11. B	18. D	25. 60	32. C
5. D	12. C	19. B	26. C	
6. B	13. C	20. C	27. B	
7. 70	14. B	21. B	28. 3	

**SECTION – III**

1. 5	8. C	15. 720	22. 7	29. 66
2. 15	9. 20	16. C	23. C	30. A
3. D	10. C	17. 22	24. D	31. 27
4. C	11. 98	18. B	25. D	32. A
5. 171	12. A	19. 122	26. D	33. 144000
6. A	13. B	20. A	27. A	34. C
7. D	14. D	21. 7	28. 6	

**Solutions**

**SECTION – I**

**Solutions for questions 1 to 6:**

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

Number of words : 598

- The passage states that "pusillanimous politicians have been ripping off their constituents with this "painless taxation.". Further, the passage also states that "If any class of gamblers qualifies as super-suckers, it's the pack of dreamers who believe what their state governments tell them about a pot of gold at the end of the numbers rainbow."

Option A: The first few paragraphs of the passage emphasize that the odds of winning the lottery are extremely low. Hence, we cannot infer that there are good chances of winning the state lottery.

Option B: While taxes are usually considered painful, the money that the people give to state lotteries are not considered painful because they willingly part with their money. This is being exploited by the politicians. Hence, this is the reason for calling state lotteries are "painless taxation".

Option C: While politicians may find it easy to raise money through state lotteries, it will not necessarily make it less painful for the people to pay for the state lotteries. Hence, this option is also incorrect.

Option D: The author states that "the profits go to education, the gambling governors claim, as they substitute lottery money for other state education aid in a classic bait-and-switch". From this we can infer that the author does not believe that this will happen. Hence, this option is also incorrect.

Therefore, the correct answer is option B.

Choice (B)

- According to the passage, "the Supreme Court strikes down state restrictions on advertising any gambling" because "states advertise their lotteries". This is provided as an instance in which the (lottery) tail wagging the (public policy) dog.

Option A: From the passage, it can be inferred that lotteries are now influencing public policy. But we cannot infer that public policy is being formulated with lotteries are the most important subject. Hence, this option is incorrect.

Option B: The passage provides an example of Supreme Court amending a law related to gambling. It does not imply that state lotteries can now directly amend the laws. Hence, this option is incorrect.

Option C: While the passage indirectly talks about public interest being ignored because of lottery advertising, this does not come out of the statement "Thus does the lottery tail now wag the public-policy dog". Hence, this option is incorrect.

Option D: The passage provides an example in which

public policy has been amended by the Supreme Court to allow state lotteries to function. Hence, this is what the statement "Thus does the lottery tail now wag the public-policy dog" implies.

Therefore, the correct answer is option D.

Choice (D)

3. The passage introduces the report of National Gambling Impact Study Commission in the sixth paragraph and provides various excerpts from the report in the subsequent paragraphs.

Option A: According to the report, "State governments have irresponsibly intruded gambling into society on a massive scale.". Hence, we can conclude that state governments have played a part in increasing the scale of gambling in America. Therefore, this is mentioned in the report.

Option B: While the passage mentions that the government should not "be a casino empowered to declare itself a monopoly so it can make a profit by stimulating public avarice". However, we cannot conclude that this was part of the report. Therefore, this option is incorrect.

Option C: The passage mentions that "State lotteries should reduce their sales dependence on low-income, less-educated gamblers, the commission recommends, and limit advertising and sales outlets in poor neighbourhoods" Hence, this option is also mentioned in the report.

Option D: The report states that "they pay back to bettors the smallest share of the take of any legal game". This option rephrases this statement and hence, is also mentioned in the report.

Therefore, the correct answer is option B.

Choice (B)

4. The passage talks about lotteries in general and state lotteries in particular in America.

Option A: The passage mentions that lotteries have the "worst odds of any betting in America". Hence, this is mentioned in the passage as a feature of lotteries.

Option B: The passage mentions that 15 million Americans are "problem gamblers". The author also says that "at least half the population enjoys betting". However, we cannot conclude that the people who enjoy betting are all problem gamblers. Hence, this option is incorrect.

Option C: The passage mentions that "Convenience gambling" with video poker terminals everywhere is a training ground for lifelong gambling". However, we cannot conclude that children are encouraged by their parents to gamble. Hence, this option is also incorrect.

Option D: The passage mentions that the first state lottery was introduced in 1964 in New Hampshire and does not talk about the first lottery in America. Hence, this option is incorrect.

Therefore, the correct answer is option A.

Choice (A)

5. The author talks about various features of state lotteries throughout the passage.

Option A: The passage, when mentioning the recommendations of the committee, states that "State lotteries should reduce their sales dependence on low-income, less-educated gamblers, the commission recommends, and limit advertising and sales outlets in poor neighbourhoods. But that's precisely where the most business is". Hence, we can infer that state lotteries target low-income and less-educated people.

Option B: The passage mentions that the most business is from low-income and less-educated people. Hence, this is also a feature of state lotteries.

Option C: The Supreme Court "strikes down state restrictions on advertising any gambling" and not state lotteries in particular. Hence, this option is not mentioned in the passage and is the correct answer.

Option D: The passage talks about the moral conflict involved in selling state lotteries. The passage also states that the state legislator "is facing the same moral conflict

as the seller of tobacco and hard liquor and violent movies: trying to make what's bad for you look good to you". Hence, this option is also mentioned in the passage.

Therefore, the correct answer is option C.

Choice (C)

6. The passage mentions that New Hampshire introduced state lotteries in 1964 followed by New York. It also states that "Now 37 states are imitating the banana republics".

Option A: While New Hampshire were among the first states to introduce state lotteries, we cannot infer that this is the definition of banana republics. Hence, this option is incorrect.

Option B: This choice almost sounds like a definition of banana republics. From the passage, it can only be inferred that state lotteries are also present in banana republics. Also, there isn't enough in the para to say that the comparison is being made only in the aspect of lotteries, and not in the aspect of 'ripping off' through camouflaged taxation. In any case, we rule out choice B because the passage does not define banana republics as such. Hence, choice B is incorrect.

Option C: The passage does not talk about gambling in banana republics. Also, we cannot infer whether most citizens in states like New Hampshire (which is compared to banana republics) are gamblers. Hence, this option is also incorrect.

Option D: The passage states that "37 states are imitating the banana republics" in conducting state lotteries. We can infer from this that these 37 states also conduct state lotteries similar to the banana republics.

Therefore, the correct answer is option D.

Choice (D)

### Solutions for questions 7 to 12:

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

Number of words : 666

7. According to the passage, "Kantian metaphysics and epistemology is held in generally very low esteem, and not taken seriously at all". The reason for this is that "idealism" is a taboo word for most mainstream contemporary analytic metaphysicians and epistemologists". From this we can say that idealism and transcendental idealism are associated with Kantian metaphysics.

Option A: The passage mentions that "if you are a "transcendental idealist," then you are obviously a very bad philosopher". Since transcendental idealism is associated with Kantian metaphysics and epistemology, we can say that the philosophers who study Kantian metaphysics are considered very bad philosophers by contemporary analytic metaphysicians. Therefore, this is the correct answer.

Option B: The passage mentions a reason for Kantian metaphysics to be held in low esteem and not for Kant's metaphysics. Hence, we cannot infer that idealism/transcendental idealism corresponds to Kant's metaphysics. Therefore, this option is incorrect.

Option C: The passage states that "It is true that even if you are an idealist or a transcendental idealist, you may still be a good "historian of philosophy." While they may be good historians, we cannot conclude for sure. that they will be. Hence, this option is incorrect.

Option D: The passage does not state that people who study Kantian metaphysics or transcendental idealists are bad historians of philosophy. Hence, this option is also incorrect.

Therefore, the correct answer is option A.

Choice (A)

8. The passage mentions the difference between Kant's ethics and Kantian ethics in the first paragraph. Kant's ethics is "the ethical theory that is developed in Kant's own writings" and Kantian ethics are "contemporary

ethical theory inspired by Kant's writings in moral philosophy, which is not slavishly restricted to Kant's own doctrines".

Option A: This option states the opposite of what is mentioned in the passage. Hence, this option is incorrect.  
Option B: Kant's ethics are not ethics developed based on the life of Kant. It is the ethics developed by Kant in his writings. Hence, this option is also incorrect.

Option C: This option correctly states the difference between Kantian ethics and Kant's ethics.  
Option D: The passage states that Kantian ethics "is rationally defensible on grounds independent of Kant's texts". But this option states that Kant's ethics are rationally defensible. Hence, this option is also incorrect.  
Therefore, the correct answer is option C.

Choice (C)

9. The passage mentions that Quine classified philosophers into two classes – "those who are interested in the history of philosophy, and those who are interested in philosophy".

Option A: While the passage mentions that transcendental idealists "may still be a good "historian of philosophy", we cannot infer from the passage that Quine also holds transcendental idealists in the same regard. Therefore, this option is incorrect.

Option B: The passage mentions that labelling transcendental idealists as "good historians of philosophy" is "cold comfort indeed, especially in view of W.V.O. Quine's well-known and widely-accepted distinction". We can infer from this that Quine, while classifying philosophers, would have accorded those interested in studying philosophy a higher status than those interested in studying the history of philosophy (since the author states that it is a "cold comfort"). Therefore, this is the correct answer.

Option C: We cannot infer from the passage whether Quine was aware of Berkeley, Kant, Schopenhauer, Hegel. Hence, this cannot be the correct answer.

Option D: The passage states that Quine classified philosophers in two categories. But we cannot infer from the passage that Quine held Kantian metaphysics in low esteem. Hence, this option is also incorrect.

Therefore, the correct answer is option B.

Choice (B)

10. The passage talks about Kantian ethics, idealism and transcendental idealism in the second and third paragraph of the passage.

Option A: The passage mentions that the reason why Kantian ethics is held in low esteem is because "idealism is a taboo word". From this paragraph, we can infer that Kantian ethics is based on idealism and transcendental idealism. However, we cannot say that Kant's ethics is based on idealism and Kantian ethics is based on transcendental idealism. Hence, this option is incorrect.

Option B: While the passage mentions that the assumptions of idealism (consciousness and intentionality) are held by "classical Rationalists and classical Empiricists alike – not to mention by all phenomenologists and many contemporary mainstream analytic philosophers", we cannot state that most of the contemporary mainstream analytic philosophers are idealists. Hence, this option is incorrect.

Option C: We can infer from the passage that Kantian ethics is based on transcendental idealism and also that modern analytic philosophers do not hold it in high regard. Hence, this option is correct.

Option D: According to the passage, Kantian ethics is held in low esteem because it is based on transcendental idealism but not the other way around. Hence, this option is also incorrect.

Therefore, the correct answer is option C.

Choice (C)

11. The passage talks about the assumptions and definition of idealism and transcendental idealism in the fourth and fifth paragraphs. Idealism is based on the assumption

that "consciousness and intentionality are primitive irreducible facts about ourselves and about the world". It is further defined as "All worldly things, properties, relations, and facts essentially include the actual or really possible existence of conscious intentional minds like ours". Transcendental idealism adds to this the assumption "that normativity, apriority, and modality are also all primitive irreducible facts about ourselves and the world".

Option A: While idealism holds that consciousness and intentionality as primitive irreducible facts transcendental idealism does not hold "only normativity, modality and apriority as primitive irreducible facts". It also holds the assumptions of idealism. Hence, this option is incorrect.

Option B: Idealism states that "all worldly things, properties, relations, and facts" include existence of "conscious intentional minds". Hence, these worldly things depend on our mental constructs. According to transcendental idealism, "all irreducibly normative, non-empirical, and modal features of all worldly things, properties, relations, and facts are essentially isomorphic with the formal or structural representations of actual or really possible rational conscious intentional minds like ours". Hence, features which are "normative, non-empirical, and modal", or features identical to them, depend on "rational" mental constructs of our consciousness. Hence, this option is correct.

Option C: The assumptions of transcendental idealism are held by "at least a significant minority of mainstream contemporary analytic philosophers". Hence, this option is incorrect.

Option D: Idealism deals with mind-dependence and transcendental idealism deals with mind-conformity. Hence, this option is also incorrect.

Therefore, the correct answer is option B.

Choice (B)

12. The passage mentions the views of the author in a few places. He calls it a "sad state of philosophical affairs" that contemporary analytic philosophers hold transcendental idealism in low regard. Towards, the end of the passage, he also states that "it is not in and of itself bad philosophy."

Option A: The author states that the two-part doctrine can be either true or false. We cannot infer that it is more likely to be false. Hence, this option is incorrect.

Option B: The author does not compare idealism with transcendental idealism. He only provides the opinion of contemporary philosophers. Hence, this option cannot be inferred.

Option C: According to the passage, the assumptions of transcendental idealism are "held by at least a significant minority of mainstream contemporary analytic philosophers". Significant minority of philosophers does not equate most of the philosophers. Hence, this option is incorrect.

Option D: The author does state that it is a sad state of affairs. He also provides an argument that most of the contemporary philosophers hold the same assumptions as those in idealism. Hence, we can infer that the author feels that transcendental idealism is unfairly regarded as bad philosophy by contemporary analytic metaphysicians.

Therefore, the correct answer is option D.

Choice (D)

#### Solutions for questions 13 to 15:

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

Number of words : 372

13. The passage starts with the statement "One terrible truth has emerged from the last fortnight of jingoistic breast-beating in Athens".

Option A: While the passage does mention that Britain performed well in the Olympics, this is not the truth that is being referred to in the first paragraph. Hence, this is not the correct answer.

Option B: It can be inferred from the passage that the Olympic team of journalists predicted disaster at the Olympics. But we cannot infer that they predicted doping scandals in the Olympics. In any case, this is not the "terrible truth" mentioned in the first paragraph.

Option C: According to the passage, "the games in Athens have gone quite well". This is in spite of the journalists predicting disaster. Hence, this is the correct answer.

Option D: The passage does not talk about any administrative issues at the Olympics. Hence, this option is also incorrect.

Therefore, the correct answer is option C.

Choice (C)

14. The passage states that "London still lurks 100 metres behind Paris in the marathon run". From the previous paragraph we can infer that the marathon run refers to the bid for hosting the Olympics.

Option A: From the statement mentioned above, this option can be eliminated as London is still behind Paris for hosting the Olympics.

Option B: While London is behind Paris in the Olympic race, we cannot infer from the passage that London is in the second place. It is possible that there are other cities in the running which are better placed than London. Hence, this option can be eliminated.

Option C: The passage states that "If the International Olympic Committee likes to give the games to countries who are enthused by the Olympics, then British fans have made a large inroad into Paris's bid to stage the 2012 games". However, the passage does not state whether the International Olympic Committee likes to give the games to countries who are enthused by the Olympics. Hence, we cannot conclude that the chances of London hosting the Olympics has increased. Hence, this option is incorrect.

Option D: The final paragraph talks about Britain having "to eat humble pie and invite the Greeks to advise us on how to make a successful bid for the games".

Therefore, the correct answer is option D.

Choice (D)

15. The passage talks about Athens and the behaviour of Athenians during the Olympics in the second paragraph.

Option A: The passage states that the "infamous taxi drivers did not rip off passengers". From this we can infer that the infamy of their taxi drivers is because they rip off their passengers. Hence, this is mentioned in the passage and is not the correct answer.

Option B: According to the passage, "Athletes and spectators were whisked around Athens in air-conditioned buses and trams, more efficiently than they would currently be in London or Paris". Hence, the transport system for the people who came for the Olympics was efficient. Therefore, this is also not the correct answer.

Option C: The passage states that "The roof was up and gleaming and almost everything else got built". The passage also mentions that any issues in the Olympics "had little to do with the host nation.". Hence, this option can be inferred from the passage and is not the correct answer.

Option D: The passage states that "If this Olympics set the record for the number of athletes kicked out or stripped of their titles for drug offences, this had little to do with the host nation.". hence, we cannot infer that drugs were freely available in Athens.

Therefore, the correct answer is option D.

Choice (D)

#### Solutions for questions 16 to 18:

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

Number of words : 529

16. The passage begins by introducing Autism and Asperger syndrome to the reader. It also mentions some of the differences between the two syndromes.

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Option A: The passage does not discuss causes, risk factors and recovery mechanisms for Autism and Asperger syndromes. Hence choice A is not the answer.

Option B: Choice B mentions the 'symptoms' of autism and Asperger syndrome. This has been mentioned

mainly in the second, third and fourth paras of the

passage and does not reflect the primary purpose of the

passage. So choice B is incorrect.

Option C: While differences between autism and Asperger syndrome have been mentioned in the passage, the focus is on explaining the two syndromes – including the points of similarities between the two. Also the passage only states that people with Asperger syndrome are **usually** more mildly affected than those with autism. It doesn't provide a reason for this. So choice C is not the answer.

Option D: Choice D aptly summarizes the primary purpose of the passage very well.

Choice (D)

17. Option A: Choice A is negated from the last sentence of para 3: As a milder autism spectrum disorder, it differs from other ASDs by relatively normal language and intelligence though physical clumsiness, unusual use of language and difficulties with fine movement control are common.

Option B: Choice B is not true. From the third last para, we know that "With the right sort of support and encouragement, many with Asperger syndrome can lead a relatively normal life". Also refer to the first sentence of the sixth para: "Some children with Asperger syndrome manage very well in mainstream schools especially if extra support is available."

Option C: Refer to the last sentence of para 4. Choice C can be inferred to be true as it has been mentioned that people suffering from autistic spectrum disorders have problems of verbal and non-verbal communication. Hence choice C is the answer.

Option D: "To people with autism and Asperger syndrome the world can appear chaotic with no clear boundaries, order or meaning" (para 4, first sentence), "Because of the range of severity and symptoms the conditions are collectively known as autistic spectrum disorders" (para 4), "People with Asperger syndrome are usually more mildly affected than those with autism." (para 5, first sentence) establish the fact that autism and Asperger syndrome are not mutually exclusive disorders. Refer to the last two sentences of para 5: "Many do encounter ..... can result in isolation, confusion, depression, all of which could be defined as 'disease'. The passage mentions "all of which could be defined as disease" in respect to symptoms like isolation, confusion and depression. So choice D is not true.

Choice (C)

18. Refer to the second and third sentences of para 5. "Some argue that Asperger syndrome is simply a variation of normal rather than a medical condition or disorder. Many do encounter particular problems getting on in the world and they become aware they are different from others."

Option A: Choice A is not the answer. "cannot be diagnosed by available technologies" has not been mentioned in the passage. "symptoms are so mild that they are not diagnosed" does not mean that there are no symptoms and that Asperger syndrome is not a clinical condition.

Option B: "Variation of normal" as well as "different from others" can be said to be individual peculiarities or mannerisms. So choice B is the answer.

Option C: The strength of symptoms has not been discussed in the passage. Choice C is out of scope.

Option D: Choice D is incorrect. Although the symptoms for Asperger syndrome are milder than those for autism, that does not necessarily mean that Asperger syndrome is not a clinical condition.

Choice (B)

**Solutions for questions 19 to 24:**

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

Number of words : 529

19. Refer to para 2. The narration of the incident is an anecdotal means of introducing the essence of the subject i.e. the practical applications of isotopes. The last sentence of para 2 mentions: His was the **first** use of radioactive tracers – now routine in environmental science. So choice C is correct. The other choices do not apply.

Choice (C)

20. Option A: Choice A is not true of chemical insecticides. It has been suggested in para 6 that **ionising radiation** to induce mutations in plant breeding has been used for several decades to produce new genetic lines of sorghum, garlic, wheat, bananas, beans and peppers, cereals and oil seed crops which are more resistant to pests and more adaptable to harsh climatic conditions.

Option B: This is a bane of chemical insecticides. The penultimate sentence of the fourth para states that chemical insecticides can also pose risks to non-target organisms. So choice B is the answer.

Option C: Chemical insecticides do not catalyze the crop losses caused by insects. It has only been stated in the third sentence of para 4 that chemical insecticides have not always been effective in reducing the losses. So choice C is not correct.

Option D: Choice D has not been suggested in the passage.

Choice (B)

21. Option A: The use of isotopes as fertilizer is unclear – but the purpose of labelling the fertilizer in the first place is clearly in order to gauge the amount of fertilizer used up by the plants i.e. as a means of measurement. Refer to the last sentence of para 3: Fertilisers 'labelled' with a particular isotope, such as nitrogen-15 and phosphorus-32 provide a means of finding out how much is taken up by the plant and how much is lost. So choice A is incorrect.

Option B: Choice B is incorrect. Adapting plants to harsh environments is made possible through ionising radiation. Hence choice B is not the answer.

Option C: While gauging the origin of water and finding an interconnection between ground and surface water have been mentioned in the last paragraph as uses of Isotope hydrology technique, there is no mention of "making seasonal adjustments in dams". The last sentence of the passage only states that information about leakages through dams and irrigation channels is provided. So choice C is not true.

Option D: The passage enumerates various examples in which radioactive isotopes have been used in improving the quality of life. So choice D is correct.

Choice (D)

22. Refer to the fifth para which talks about the uniqueness of the Sterile Insect Technique (SIT) program.

Option A: If the normal male insect fertilize the female insects in large numbers, then eradication of the insects becomes difficult. Choice A ensures that there is a greater chance of success.

Option B: The SIT program is used as a solution because insects have become resistant to chemical insecticides used. But choice B is absurd and is not the factor for success of the SIT program.

Option C: The fifth para does not talk about releasing laboratory-bred female insects or wild type male insects in infested areas. So choice C is not the reason.

Option D: Choice D has not been mentioned. Para 5 does not talk about similarity between laboratory-bred insects and wild type male insects. It only talks about how laboratory reared male insects are rendered sterile before releasing them in the environment so that no offspring of the pest insects are produced.

Choice (A)

23. Refer to the first sentence of para 3. "Radioisotopes play an important part in technologies that provide us with basic needs like food, water and **good health**". After discussing the use of isotopes in agriculture and water management, their use in health would most probably be the next topic. Hence choice D is apt.

Option A: Uses of radioisotopes in crop management and insect (pest) management have already been discussed much before the last paragraph of the passage. So choice A cannot continue as a discussion in the following paragraph after the passage.

Option B: Choice B has already been discussed in the last paragraph. So it cannot be a part of the discussion in the succeeding paragraph.

Option C: While mention has been made about 'electrical energy' in the first paragraph and a sentence in passing (in the penultimate paragraph) about astronauts in space eating foods preserved by irradiation, choice C cannot be the answer.

Choice (D)

24. Option A: The author only mentions the positive benefits of radioisotope technology without expressing any negative features or problems about the same. So "guarded appreciation" as a response is incorrect. Choice A is not the answer.

Option B: Choice B is incorrect as the author does not express doubts about radioisotope technology.

Option C: The response of the author of the passage towards the idea of radioisotope technology can be said to be one of positive enthusiasm. Refer to the last sentence of para 1 and the first sentence of para 3. So choice C is correct.

Option D: The passage does not criticize radioisotope technology. In fact, it states its many advantages. Hence choice D is incorrect.

Choice (C)

**Solutions for questions 25 to 29:**

25. On a careful reading of the sentences, it can be observed that sentence (3) is a general sentence that begins the paragraph. It introduces the Pritzker Architecture Prize. Sentence (5) follows sentence (3). "This recognition" in sentence (5) refers to "top prize (Nobel Prize of architecture)" mentioned in sentence (3). Sentence (5) provides the objective of the Pritzker Architecture Prize. Sentence (4) follows and it provides the historical details (i.e. details about the origin/ institution) of the Pritzker Architecture Prize. "1979" and "Pritzker family pays for the prize" in sentence (4) is best followed by "Today, winners get .....," as given in sentence (2). Sentence (2) concludes the paragraph. So, 3542. Sentence (1) cannot be a part of an introductory para on the Pritzker Architecture Prize. It needs a precedent (can also make a personal application .....). It can be a part of the paragraph which discusses details about nominations for the prize and how the prize winner is selected. Actually, 3425 would be just as good as 3542, **except for the fact** that 'this recognition' must refer to something singular (the award in sentence 3) and not to its three components as mentioned in sentence 2.

Ans: (3542)

26. On a careful reading of the sentences, it can be observed that sentence (5) is a general sentence (field recording trip to Spain.....) that begins the paragraph. It has the name of the person "Alan Lomax", the year "1953" and the name of the country "Spain". Sentence (4) follows sentence (5). The pronoun "he" in sentence 4 points to the proper noun "Alan Lomax". During the field recording trip to Spain, Alan Lomax was struck by the difference between the singing styles and culture of northern and southern Spain. Sentence (1) continues the discussion. "song style reflects and reinforces cultural style" is a profound idea or concept that follows from the observation ("difference between the singing styles and culture ....") mentioned in sentence (4). So, 541. Sentence (3) follows sentence (1). "nurturance of this **seminal concept**" in sentence (3) follows after "The seed of a simple, yet **profound idea** was planted" in sentence

(1). Also "Cantometrics, a system of measuring world **song styles** and correlating them with **cultural data**" in sentence (3) links with "**song style** reflects and reinforces **cultural style**" in sentence (1). Sentence (3) concludes the paragraph. Hence, 5413. Sentence (2) leaves the thoughtflow incomplete. It sounds like an introductory sentence of another paragraph. "ethnomusicology" in sentence (2) needs a precedent and more substantiation.

Ans: (5413)

27. On a careful reading of the sentences, it can be observed that sentence (2) is a general sentence (It's hardly a coincidence ..... ) that begins the paragraph. It introduces the background: Coffee caught on in Europe ..... during the age of factories and industries. Sentence (4) follows sentence (2) as it reiterates the same point. "coffee caught on in Europe" in sentence (2) links with "widespread use of coffee, a caffeinated drink" in sentence (4). Also, "first factories were ushering in the industrial revolution" in sentence (2) links with "facilitated the great transformation of human economic endeavor from the farm to the factory" in sentence (4). Sentence (1) comments on how coffee was beneficial to workers. Since there was a change from farming activity to the factory setting, boiling water decreased the incidence of disease among workers and caffeine prevented the workers from falling asleep. Sentence 3 concludes the paragraph. Caffeine in coffee made the modern world possible. "24-hour society" in sentence (3) points to the "transformation of human economic endeavor" as given in sentence (4). So, 2413. Sentence 5 is the odd sentence out and can be a part of another paragraph. It doesn't specifically talk about caffeine or coffee.

Ans: (2413)

28. On a careful reading of the sentences, it can be observed that sentence (3) is a general sentence that begins the paragraph. It introduces the background: medieval writers being unsure about whether towns in the medieval age were good or bad. Sentences (3) and (2) form a mandatory pair. "on one hand" in sentence 3 links with "But, on the other" in sentence 2. Also "vital hubs of economic and cultural activity" in sentence (3) contrasts "dangerous temptations: their dirty taverns and gambling dens". Sentence (2) is followed by sentence (5) which highlights Richard Devizes' negative impression of London (evil thing ..... in that one town). Sentences (5) and (1) form another mandatory pair. The conjunctive adverb 'however' in sentence (1) contrasts the negative impression of London as portrayed in sentence (5) with praise words for London as mentioned in sentence (1) (thrilling spectacles, and exciting pastimes). The pronoun 'it' in sentence (1) refers to London. Also, "at around the same time" in sentence (1) refers to "the 1190s" – a medieval period. So, 3251. Sentence 4 runs tangent to the discussion on medieval towns. It is the odd sentence out and can be a part of another paragraph discussing intricate details about or other features of medieval towns. It needs a precedent and more substantiation.

Ans: (3251)

29. On a careful reading of the sentences, it can be seen that sentence (4) is a general sentence that begins the paragraph. It tells us what syllabic alphabets are and that the main element in them is the syllable. Sentence (2) follows sentence (4) as it elaborates on the constituents of 'syllables'. Sentences (2) and (1) form a mandatory pair. "each of which has an inherent vowel" in sentence (2) links with "change or mute the inherent vowel" in sentence (1). Sentence (1) highlights the importance of diacritic symbols. Sentence (5) continues the discussion by telling us what is done when two or more consonants occur together. So, 4215. Sentence (3) is the odd sentence out. It deviates from a basic discussion on syllabic writing and focuses on the syllabaries used in the contemporary Japanese language. It can be a part of a paragraph that explains about languages that use syllabic writing.

Ans: (4215)

#### Solutions for questions 30 to 32:

30. In part (1), "both" and "as well as" cannot be used together. Either the part should read: With the massive success of **both The Avengers franchise and Guardians of the Galaxy, (OR)**

With the massive success of **The Avengers franchise as well as Guardians of the Galaxy,**

Part (2) needs the superlative degree of comparison "highest" and not the positive degree of comparison "high". Further, the correct usage is "...of all time" not "...of all times."

Part (3) has the redundant word 'again' used along with 'repeat'. The part should read "eager to repeat that achievement."

Part (4) is grammatically correct.

Part (5) is also grammatically correct.

Ans: (45)

31. In part (1), "European Space Agency's Mars mission" should be preceded by the definite article 'the'.

In part (2), 'providing' needs to be replaced with 'provide' [infinitive form: (to) provide]

Part (3) needs "seven-month journey" and not "seven-months journey".

Part (4) needs the phrasal verb "slated for" and not "slated on".

Part (5) is error-free.

Ans: (5)

32. Part (1) is grammatically correct.

Part (2) has errors of punctuation. The part should read: The chirpy sounds made by these small birds are rarely heard today; and their absence, even though tiny, is ..... Part (3) also has an error. The part should read: **increasingly** becoming noticeable. The adverb 'increasingly' should be used in place of the adjective 'increasing'. Also the adverb of frequency 'increasingly' should be placed in between the verbs 'is' and 'becoming'.

In part (4), "Red Data List" should suffice. We don't need an apostrophe for the word 'List'.

Part (5) needs 'once regarded' in place of 'regarded once'.

Ans: (1)

#### Solutions for questions 33 and 34:

33. The first sentence in choice A summarizes the second sentence of the paragraph. But the third sentence in choice A (..... touch of the real) is out of scope. Choice A also leaves out some important points in the paragraph. Choice B correctly and succinctly mentions all the main points of the paragraph. Hence choice B best captures the essence of the text.

The given paragraph does talk about a list of extremes. But the list of extremes in the paragraph is meant to show the range of Shakespeare's works, not to imply that they are extreme in nature. Also "simple and elaborate, organic and synthetic, whimsical and profound" in choice C is out of scope. So choice C is not a true summary of the paragraph. It is also incomplete as a summary. It does not talk about the influence of Shakespeare's works on people.

The word 'surprisingly' gives a different twist to choice D. The second sentence in choice D is very generalized (then or now, ..... make such creative leaps possible). Choice D is also incomplete as a summary of the paragraph.

Choice (B)

34. The second sentence in choice A is true about the country and not true about the Lençóis Maranhenses National Park. The third sentence in choice A is out of scope. Choice A is also incomplete as a summary.

Choice B is wrong because 'dunes over 50 km from the coast' (as given in the paragraph) mean that they begin over 50 km from the coast, whereas 'dunes for over 50 km from the coast' (as in sentence B) would mean dunes stretching from the coast to a point beyond 50 km from the coast. Also the last sentence of choice B cannot

be confirmed. It has been mentioned in the last sentence of the paragraph that the eggs of the fish and crabs are **probably** maintained alive in the sand, exploding when rain comes back.

Choice C does not cover all the important points of the paragraph. It is not an apt summary of the paragraph. Choice D summarizes all the main points. It has been mentioned in the last sentence of the paragraph that the eggs of the fish and crabs are **probably** maintained alive in the sand, exploding when rain comes back. So the usage of the word 'perhaps' in the last sentence of choice D is correct.

Choice (D)

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

## SECTION – II

### Solutions for questions 1 to 4:

1. If we divide the revenues by the percentage cost, we get the total cost for the five companies combined at which the company will make no profit and no loss. This is calculated below:

$$\text{Company A: } \frac{120}{0.2} = 600$$

$$\text{Company B: } \frac{150}{0.15} = 1000$$

$$\text{Company C: } \frac{180}{0.25} = 720$$

$$\text{Company D: } \frac{210}{0.3} = 700$$

$$\text{Company E: } \frac{100}{0.1} = 1000$$

If the total cost is ₹710000, A and D will incur a loss.

Ans: (2)

2. Since company C neither made a profit nor incurred a loss, cost incurred by C = ₹180,000

$$\text{Cost incurred by company B} = 180000 \times \frac{15}{25}$$

$$= ₹108,000$$

$$\text{Profit of company B} = ₹42,000$$

Ans: (42000)

3. From the previous question, since only two companies made profit, the total cost incurred must be between ₹720,000 and ₹1000,000. Hence, the cost incurred by company C can be between ₹180,000 and ₹250,000.

From the options, the answer is ₹200,000.

Choice (D)

4. Let  $x$  be the total cost incurred by the five companies combined.

$$\text{Profit made by C} = 180 - 0.25x$$

$$\text{Profit made by D} = 210 - 0.3x$$

$$\text{Given that } 180 - 0.25x > 210 - 0.3x$$

$$\Rightarrow 0.05x > 30 \Rightarrow x > 600$$

Since both the companies made a profit,  $x$  has to be less than 700.

From the options, the total cost can be ₹610,000.

Choice (B)

### Solutions for questions 5 to 8:

5. Required percentage for AIMCAT 1 = 125%

Required percentage for AIMCAT 6 = 120%

Required percentage for AIMCAT 7 = 130%  
Required percentage for AIMCAT 17  $\cong$  145%  
Hence, the percentage is the highest for AIMCAT 17.  
Choice (D)

6. Sum of the scores obtained by Raju across all the AIMCATs = 3620  
Average score =  $3620/25 = 144.8$  Choice (B)

7. By observation, we can see that for AIMCAT 19, this difference is 70.  
Ans: (70)

8. For AIMCAT 21, performance index =  $\frac{165}{160} = 1.03$

Performance Index for AIMCAT 20 =  $\frac{115}{150} = 0.77$

Percentage increase =  $\frac{0.26}{0.77}$

For AIMCAT 3, performance index =  $\frac{165}{150} = 1.1$

Performance Index in AIMCAT 2 =  $\frac{120}{110} = 1.09$

Percentage Increase =  $\frac{0.01}{1.09}$

For AIMCAT 16, performance index =  $\frac{170}{150} = 1.13$

Performance index for AIMCAT 15 =  $\frac{160}{180} = 0.89$

Percentage Increase =  $\frac{0.24}{0.89}$

For AIMCAT 17, performance index =  $\frac{175}{120} = 1.46$

Performance Index for AIMCAT 16 = 1.13

Percentage Increase =  $\frac{0.33}{1.13}$

We can see that only the first value is more than 0.3.  
Hence, the highest increase, among the given options, is for AIMCAT 21.

Choice (A)

### Solutions for questions 9 to 12:

9. Cash available at 3:00 PM =  $250000 - 100000 - 325000 + 15000 + 10000 + 225000 - 125000 + 75000 - 85000 + 100000 + 25000 - 125500 + 135500 - 45000 = 30000$   
Cash available at 10:20 AM =  $250000 - 100000 - 325000 + 15000 = - 160000$ . However, the customer who wants to withdraw 325000 will not be serviced by 10:20. Hence, the cash available in the bank will be  $325000 - 160000 = 165000$   
Similarly, cash available at 11:00 AM = 75000  
Cash available at 3:56 PM will be 0.  
Hence, the answer is 10:20 AM.

Choice (B)

10. The customer who waited and their respective waiting times are:

Customer 2: 15 minutes

Customer 5: 70 minutes

Customer 7: 15 minutes

Customer 9: 100 minutes

Customer 12: 10 minutes

Customer 14: 15 minutes

Average waiting time per customer

$$\frac{15+70+15+100+10+15}{15} = 15 \text{ minutes}$$

Choice (D)

11. Whenever a customer waited, there was no cash available in the bank. The total time for which no cash

was available in the bank is  $15 + 70 + 15 + 100 + 10 + 15 = 225$  minutes.

Hence, the required duration = 225 minutes.

Choice (B)

12. From the given options, Customer 5 waited the longest (70 minutes).  
Choice (C)

**Solutions for questions 13 to 16:**

13. The total number of students who appeared for Class X final exam =  $\frac{1065}{71} = 15$

The remaining students would have been expelled in the previous classes.

Number of students expelled =  $50 - 15 = 35$

Choice (C)

14. Number of students who appeared for Class VIII final exam =  $\frac{1725}{69} = 25$

Number of students who appeared for Class IX final exam =  $\frac{1440}{72} = 20$

Hence, 5 students were expelled in Class VIII.

Choice (B)

15. Number of students who appeared for Class V final exam = 50  
Number of students who appeared for Class VI final exam =  $\frac{2788}{68} = 41$

Number of students who appeared for Class VII final exam =  $\frac{2706}{82} = 33$

Number of students who appeared for Class VIII final exam =  $\frac{1725}{69} = 25$

Number of students who appeared for Class IX final exam =  $\frac{1440}{72} = 20$

Number of students who appeared for Class X final exam =  $\frac{1065}{71} = 15$

The maximum number of students were expelled at the end of Class V.

In Class X, the maximum number of students who can be expelled is 7 (7 students can score 40 marks each and the remaining 8 will score 785. If more than 7 students are to be expelled, the remaining students must score more than 100 marks which is not possible).

Hence, the maximum number of students were expelled at the end of Class V.  
Choice (A)

16. Number of students who cleared Class VI exams = 33 (same as the number of students who appeared for Class VII exams).

**Solutions for questions 21 to 24:**

From i and iii, the person wearing blue shirt came immediately after Tarun and sat to his right and Praveen arrived before Tarun and sat to his left. Hence, the managers sat in a clockwise direction in the order of their arrival.

Since Bobby sat opposite to the person wearing a green shirt, he should have sat opposite Tarun and Tarun was wearing a green shirt. Also, the person sitting opposite Praveen has to be wearing either red or orange shirt.

Raja or Kalyan would have sat in the remaining seats.

The information given in the conditions is represented in the picture.

From i, the person sitting to the right of Tarun did not arrive last. From this, we can conclude that the person sitting to Bobby's left did not arrive first. Also, Tarun did not arrive last. Hence the person sitting to the right of Tarun did not arrive first as well.

From ii, Bobby did not arrive last. Hence the person sitting to his right, Amar, did not arrive first.

If the average of these students is to be highest, the remaining students must have scored 0.

Hence, the highest possible average

$$= \frac{2788}{33} = 84.5$$

Choice (D)

**Solutions for questions 17 to 20:**

From (ii), the best position in which Pavan could have achieved in any event is 3. From (i), the positions in which Pavan finished the three events must be 3, 4 and 5 in any order.

From (iii) and (vi), in Cycling, Tarun finished fifth and Gaurav finished fifth. Hence, Pavan must have finished 3<sup>rd</sup> in Cycling. From (iii), Tarun must have finished third in Running. Since Pavan has to finish the other two events (Running and Hurdles) in 4<sup>th</sup> and 5<sup>th</sup> positions, he must have finished fifth in Hurdles and fourth in Running.

From (iv), Suresh position in two events must be first and fifth. Suresh could have come fifth only in Running. From (v), Ramesh could not have finished first in Cycling (since Gaurav finished 4<sup>th</sup>). Hence, Suresh must have been the first in Cycling and Ramesh must have been the second.

Since Ramesh must have been first in one event, he could not have finished in a worse position than fourth in any event (from(iv)). In Running, Ramesh cannot be 4<sup>th</sup> (since Pavan is 4<sup>th</sup>), he cannot be third (since Tarun is third) and he cannot be 2<sup>nd</sup> (since he is 2<sup>nd</sup> in Cycling). Hence, Ramesh must have been 1<sup>st</sup> in Running. From (v), Gaurav was the second in Running. In Hurdles, Ramesh cannot be 4<sup>th</sup> or 2<sup>nd</sup>. Hence, he has to be 3<sup>rd</sup>. Gaurav must have been the first in Hurdles and Suresh must have been the second in Hurdles.

The following table gives the positions of the five persons in the three events:

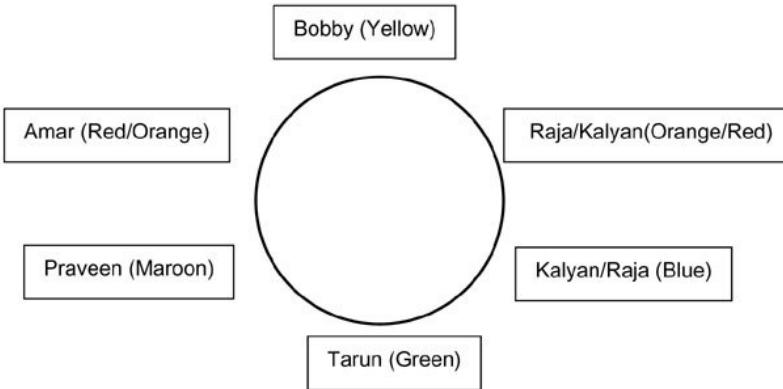
Person	Running	Cycling	Hurdles
Gaurav	2	4	1
Pavan	4	3	5
Ramesh	1	2	3
Suresh	5	1	2
Tarun	3	5	4

17. Ramesh came first in Running. Choice (A)

18. Suresh came second in Hurdles. Choice (D)

19. Gaurav did not come last in any of the three events. Choice (B)

20. The sum of the positions of Ramesh is the lowest. Choice (C)



Hence, only Praveen or Bobby would have arrived first.

21. Tarun was wearing a green shirt.  
Choice (B)
22. Among the given options, only Praveen could have arrived first.  
Choice (A)
23. If Kalyan was wearing an orange shirt, Amar would be sitting opposite to Raja.  
Choice (B)
24. If Bobby was the first to arrive, they could have arrived in 2 ways. If Praveen came first, they could have arrived in two ways, irrespective of Amar's shirt's colour.  
Ans: (4)

#### Solutions for questions 25 to 28:

From (iii), Jatin purchased the stock at ₹60 and sold it for less than ₹60. From (v), Dev sold the stock at the same price. Since Dev made a profit of ₹40, he must have sold it for ₹50. If it was any less, the price at which Dev purchased the stock would be 0 or negative. Hence, Dev purchased the stock for ₹10 and sold it for ₹50. Jatin purchased the stock for ₹60 and sold it for ₹50. From (i), Kiran sold the stock for ₹10.

Between Lateef and Harvey, one person has to sell the stock at ₹60 (from (iv)). If Lateef sold the stock at ₹60, from (vi), Kiran would have purchased the stock at ₹60. Then Kiran would have made a loss of ₹50 which would violate condition (ii). Hence, Harvey sold the stock for ₹60. From (v), Lateef purchased the stock for ₹60. From (ii), one person has to make a profit of ₹50. This can't be Kiran because he would have to purchase the stock at a negative price. This can't be Lateef either because the price at which Lateef sells must be ₹110 which would violate conditions (ii) and (iv). Hence, Harvey would have made the profit of ₹50. Hence, Harvey purchased the stock at ₹10.

Between Lateef and Kiran one has to incur a loss of ₹30. From (iv), Kiran has to incur a loss of ₹30. Hence, Kiran purchased the stock at ₹40 and Lateef purchased it at the same price. The following table gives the prices at which each person purchased and sold and the profit/loss made by each person:

Person	Purchase Price (in ₹)	Selling Price (in ₹)	Profit/Loss (In ₹)
Dev	10	50	40
Harvey	10	60	50
Jatin	60	50	-10
Kiran	40	10	-30
Lateef	60	40	-20

25. Lateef purchased the stock at ₹60.  
Ans: (60)
26. Lateef sold the stock for ₹40.  
Choice (C)
27. Kiran incurred the highest loss.  
Choice (B)
28. Three people incurred a loss.  
Ans: (3)

#### Solutions for questions 29 to 32:

From (i), Akbar purchased a deodorant. From (iii), Aurangazeb visited Spencers. From (ii), (iv) and (v), Aurangazeb could not have purchased pen or batteries or broom. Hence, Aurangazeb must have purchased candles or water bottle. From (iii), Jahangir bought a water bottle. Hence, Aurangazeb purchased candles. Since Akbar purchased a deodorant, he could not have visited Spar or More. From (v), Akbar did not go to BigBazaar and from (i), Akbar did not go to Walmart. Hence, Akbar went to Hypercity. From (iv), Humayun did not buy a pen. Hence, Humayun purchased batteries at More and Shahjahan purchased a pen at Spar.

The following table presents this information:

Person	Store	Item
Akbar	Hypercity	Deodorant
Aurangazeb	Spencers	Candles
Babur	BigBazaar	Broom
Humayun	More	Batteries
Jahangir	Walmart	Water bottle
Shahjahan	Spar	Pen

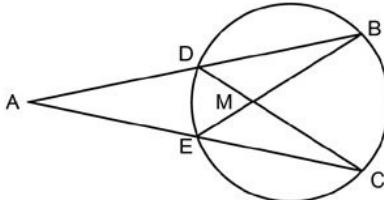
29. Shahjahan visited Spar.  
Choice (A)
30. Humayun bought batteries.  
Choice (B)
31. The water bottle was bought at Walmart.  
Choice (B)
32. Aurangazeb bought candles.  
Choice (C)

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

#### SECTION – III

#### Solutions for questions 1 to 34:

1.  $y = \sqrt{13} \sqrt{13} \sqrt{13} \dots \infty$   
 squaring both sides, we get  
 $\therefore y^2 = 13 \sqrt{13} \sqrt{13} \sqrt{13} \dots \infty = 13y$   
 $y^2 - 13y = 0; y(y - 13) = 0$   
 $y \neq 0, y = 13,$   
 $\therefore y - 8 = 5$   
 Ans: (5)

2. Let the initial number of coins with Ajay be N  
 Firstly, N must be even, (since he gave one more than half of N to Bulu). Further, let  $\frac{1}{3} \left[ \frac{N}{2} - 1 \right] = k$ , \_\_\_\_\_ (1)  
 where k is a natural number and  $\frac{2}{3} \left[ \frac{N}{2} - 1 \right] \geq 2$  \_\_\_\_ (2)  
 (Since he gave two coins more than one-third of the remaining to Chintu).  
 Hence, Chintu got a total of  $(k + 2)$  coins.  
 If k is a natural number, from (1), we get N must be of the form  $6k + 2$ , which also is even (the first requirement).  
 Further, from (2),  $N \geq 8$ .  
 Hence, N can be any number of the form  $6k + 2$ , where  $k = 1, 2, 3, \dots$   
 Since it is mentioned that N is a two-digit number,  $10 \leq N \leq 99$ .  
 Hence, the possible values of k are 2, 3, 4, ..., 16, i.e., N can assume a total of  $16 - 2 + 1 = 15$  distinct values.  
 Ans: (15)
- 3.
- 
- $\triangle ABE \approx \triangle ACD$  [AAA]  
 $\therefore \frac{BE}{CD} = \frac{AE}{AD} = \frac{AB}{AC} = \frac{9}{11}$  (given)
- Again  $\triangle MBD \approx \triangle MCE$  [AAA]  
 $\angle DBM = \angle MCE, \angle BDM = \angle CEM$  and  $\angle DMB = \angle EMC$   
 $\therefore (DM)(MC) = (EM)(MB)$   
 $\therefore (EM)(MB) = 4(18)$   
 $\therefore \frac{BE}{CD} = \frac{9}{11} \Rightarrow BE = \frac{9}{11} (22) = 18$   
 $\therefore EM + MB = 18$   
 $MB + \frac{72}{MB} = 18 \quad [\because (EM)(MB) = 72]$   
 $(MB)^2 + 18(MB) + 72 = 0$   
 $(MB - 6)(MB + 12) = 0$   
 $\therefore MB = 6$  or  $MB = 12$ .  
 As  $EM < MB$ ,  $MB = 12$ .  
 Ans: (D)
4. Let the shares of land be  $a$ ,  $ar$  and  $ar^2$  ( $r > 1$ ). Now, given  $a(r^2 - 1) = 385$  and  $a(r + 1) = 770$   
 $\Rightarrow \frac{a(r^2 - 1)}{a(r + 1)} = \frac{385}{770}$   
 $\Rightarrow r - 1 = 0.5$   
 $\Rightarrow r = 1.5$  and  $a = 308$ .  
 Hence  $A = 308 (1 + 1.5 + 2.25) = 1463$ .  
 Ans: (C)
5. A number with 3 even factors and 3 odd factors must be of the form  $2^1(x)^2$ , where x is odd and prime.  
 Sum of the odd factors =  $x^0 + x^1 + x^2$   
 Sum of the even factors =  $2(x^0 + x^1 + x^2)$   
 Now, if sum of odd factors = X (say), then clearly sum of even factors =  $2X$  and total sum (of all factors) =  $3X$ .  
 Given that  $2X - X = 57$ , we get  $X = 57$ .  
 Hence, required answer =  $3 \times 57 = 171$ .  
 Ans: (171)
6. Let us consider that everyday they met at a point A at 7:00 am. On the specified day, they met at point B at 6:58 am.  
  
 As Kapil started 10 minutes early, he would have reached point A at 6:50 am. In 8 minutes, he then travels from A to B.  
 The bus is at B at 6:58 am, but it will be at A at 7:00 am. Therefore the bus travels from A to B in 2 minutes, which Kapil takes 8 minutes to cover. Thus the speed of the bus is four times that of Kapil, i.e. required ratio = 4 : 1  
 Choice (A)
7. Since they together took 45 minutes to do the work that Bulu alone would have done in one hour, together they are  $\frac{60}{45} = \frac{4}{3}$  times as efficient as Bulu.  
 $a = \frac{b}{3}$  (where, a and b are their rates of doing work)  
 Had they worked for equal intervals of time they would have shared the amount in the ratio of their rates of work.  
 $\therefore$  Bulu's share would have been  
 $\frac{3}{(1+3)} (6000) = ₹4500$   
 Choice (D)
8.  $3x + 5y = 24$  and  $4x + ky = 32$  will have infinite number of solutions if,  
 $\frac{3}{4} = \frac{5}{k} = \frac{24}{32}$ ,  
 $\Rightarrow k = \frac{20}{3} = 6\frac{2}{3}$   
 Choice (C)
9. Let the cost price of the item be 100  
 Given mark up = 50%  
 $\Rightarrow$  The marked price = 150  
 Given, discount = 20%  
 $\Rightarrow$  selling price =  $150 - 20\%$  of 150  
 $= 150 - 30 = 120$   
 $\therefore$  profit = 20 on a C.P. of 100, i.e., 20%  
 Ans: (20)
10.  $81^a + 9^a + 1 = (9^a + 3^a + 1)(9^a - 3^a + 1)$   
 $= (9^a + 3^a)(9^a - 3^a + 1) + 9^a - 3^a + 1$   
 Thus when  $81^a + 9^a + 1$  is divided by  $9^a + 3^a$ , the quotient is  $9^a - 3^a + 1$  and the remainder is  $9^a - 3^a + 1$
- Alternative Solution:**  
 Substituting  $a = 1$  we get  $81^a + 9^a + 1 = 91$  and  $9^a + 3^a = 12$   
 $\therefore$  Required remainder = 7.  
 Observing the choices, choice (A) is eliminated but any of the remaining choices is possible.  
 Now, substituting  $a = 2$ , we get  $81^2 + 9^2 + 1 = 6643$  and  $9^2 + 3^2 = 90$ .  
 Now, required remainder = 73. Observing the choices, only choice (C) satisfies.  
 Choice (C)
11.  $f(n) = 1(1!) + 2(2!) + 3(3!) + \dots + n(n!)$   
 $= (2-1)! + (3-1)2! + (4-1)3! + \dots + [(n+1)-1]n!$   
 $= 2! - 1 + 3! - 2! + 4! - 3! + \dots + (n+1)! - n!$   
 $= (n+1)! - 1$   
 $\therefore f(117) = 118! - 1$  and  $f(111) = 112! - 1$   
 $\therefore f(117) + f(111) = 118! + 112! - 2$   
 As both 118! And 112! are multiples of 100, the remainder is  $100 - 2 = 98$ .
- Alternative Solution:**  
 Since  $f(10)$ , onwards all are divisible by 100, we only need to find the last two digits of  
 $2(f(9)) = 2(1(1!) + 2(2!) + 3(3!) + \dots + 9(9!))$

Now, using the onscreen calculator we can easily calculate the above value and find that the last two digits to be 98.  
Ans: (98)

$$\begin{aligned} 12. \log_2 x \cdot 3^y \cdot \log_3 x \cdot \log_2 y &= 0 \\ \Rightarrow \log_3 x \cdot \log_2 y &= (2^x 3^y)^0 = 1 \\ \Rightarrow \log_2 y &= 3^x \\ \Rightarrow 64 &= 2^{y(3^x)} \\ \therefore 2^{y(3^x)} &= 2^6 = 2^{2 \times 3} \end{aligned}$$

Therefore, the possible solutions are  
 $y = 6, x = 0$  and  $y = 2, x = 1$   
As  $x$  and  $y$  are positive integers, we get  
 $x = 1$  and  $y = 2$ , which gives  $xy = 2$

#### Alternative Solution:

Since there is no 'cannot be determined' in the answer choices, we can plug in any values of  $x$  and  $y$  that satisfy. By observation,  $y = 2$  and  $x = 1$  satisfy. Hence,  $xy = 2$ .  
Choice (A)

13. Since  $720 = 4(2^2 \times 3^2 \times 5)$   
Number of factors of 720 divisible by 4 is equal to the number of factors of  $2^2 \times 3^2 \times 5^1 = 18$  factors  
Again,  $720 = 16(3^2 \times 5^1)$   
Number of factors of 720 divisible by 16 is equal to the number of factors of  $3^2 \times 5^1$  i.e., 6 factors  
Now, the factors of 720 divisible by 16 are included among the factors of 720 divisible by 4. Therefore the number of factors of 720 divisible by 4 but not by 16 =  $18 - 6 = 12$  factors.

#### Alternative Solution:

$720 = 2^4 \times 3^2 \times 5$   
The required number of factors is number of ways each of the above prime factors (2, 3, 5) can appear in a factor which is divisible by 4 but not by 16.

$$\begin{aligned} 2 &\rightarrow 2 \text{ ways (as } 2^2 \text{ and } 2^3\text{)} \\ 3 &\rightarrow 3 \text{ ways } (3^0, 3^1, 3^2) \\ 5 &\rightarrow 2 \text{ ways } (5^0, 5^1) \\ \therefore \text{ required No. of factors} &= 2 \times 3 \times 2 = 12 \text{ factors} \end{aligned}$$

Choice (B)

14. The product of all the factors of  $N = N^{(\text{No. of factors of } N)/2} = N^8$   
Therefore, the number of factors of  $N$  is 16  
Now, checking for the number of factors of the number given in each option, we get (A)  $\rightarrow 12$ ; (B)  $\rightarrow 12$ ; (C)  $\rightarrow 14$  and (D)  $\rightarrow 18$ . Since (D) has 18 factors, it cannot be a factor of  $N$ .

$\therefore$  Among the options, only (D) cannot be a factor of  $N$ .  
Choice (D)

15. Let the number of chocolates with Sharmistha and Devjani be denoted by  $S$  and  $D$  respectively.

$$\text{It is given that, } \frac{S - \frac{2}{5}S}{D + \frac{2}{5}S} = \frac{D}{S}$$

$$\begin{aligned} \Rightarrow \frac{\frac{3}{5}S}{D + \frac{2}{5}S} &= \frac{D}{S} \\ \Rightarrow 3S^2 &= 5D^2 + 2(S)(D) \\ \Rightarrow 5D^2 + 2(S)(D) - 3(S)^2 &= 0 \\ \Rightarrow 5D^2 + 5(S)(D) - 3(S)(D) - 3(S)^2 &= 0 \end{aligned}$$

$$\Rightarrow 5D(D + S) - 3S(D + S) = 0 \Rightarrow (5D - 3S)(D + S) = 0$$

$$\therefore D + S \neq 0 \therefore 5D - 3S = 0$$

$$\therefore \frac{D}{S} = \frac{3}{5}$$

That is  $D = 60\%$  of  $S$ , i.e.,  $p = 60$  and  $12p = 720$

#### Alternative Solution:

If the number of chocolates with Sharmistha and Devjani is 100 and  $D$  respectively, then we get the equation.

$$\frac{100}{D} = \frac{(D+40)}{60}. \text{ By simple observation, it can be identified that } D = 60 \text{ satisfies, and hence } p = 60 \text{ and } 12p = 720.$$

Ans: (720)

16. We can either select the men first or the women first. We can select the 3 men from the 10 men in  $10C_3$  ways. Now, whichever man is selected, his wife cannot be selected, so we have only 7 women to select from 2 women can be selected from 7 women in  $7C_2$  ways. Therefore, the number of ways in which the committee can be formed =  $10C_3 \times 7C_2 = 2520$

Choice (C)

17. The maximum number of regions into which the area inside a circle can be divided by drawing  $n$  straight lines =  $\frac{n(n+1)}{2} + 1$   
For  $n = 6$ , we get the number of regions as 22  
Ans: (22)

18. We are given the ratio of the sum to  $n$  terms of the two progressions, which is also equal to the ratio of the middle terms. Now if the 12<sup>th</sup> term must be the middle term, then  $n$  must be 23. Hence, substituting  $n = 23$  in  $(5n + 7) : (3n - 8)$  will give the required ratio.  
Therefore, the ratio of their 12<sup>th</sup> terms is 2 : 1

Choice (B)

19. Let the roots be  $x - d, x$  and  $x + d$  respectively.  
Sum of the three roots = 21  
 $\therefore 3x = 21 \Rightarrow x = 7$   
Product of the roots =  $(7 - d)(7)(7 + d) = 168$   
 $(7 - d)(7 + d) = 24$   
 $49 - d^2 = 24$   
 $\Rightarrow d = \pm 5$   
Therefore the roots are 2, 7 and 12  
The value of  $a$  = Sum of the roots taken two at a time =  $(2 \times 7) + (2 \times 12) + (7 \times 12) = 122$   
Ans: (122)

20. Let the principal be  $P$  and the rate of interest be  $r\%$  per annum.

$$\text{Now, } P + \frac{5Pr}{100} = 2P$$

$$\frac{5Pr}{100} = P \Rightarrow r = 20\%$$

Now rate of interest =  $20\% + 5\% = 25\%$

Let the sum quadruple in  $n$  years at 25% per annum simple interest.

$$P + \frac{Pn25}{100} = 4P$$

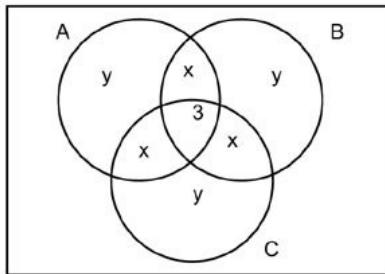
$$\frac{Pn}{4} = 3P \Rightarrow n = 12 \text{ years.}$$

Choice (A)

$$21. 40C_{30} = \frac{40!}{30! 10!} = \frac{31 \times 32 \dots 40}{1 \times 2 \times \dots \times 10}$$

We need to check for each of the primes from 1 to 40, if their highest power in the numerator exceeds that in the denominator. This is true only for 2, 11, 13, 17, 19, 31 and 37, i.e., a total of 7 prime factors.  
Ans: (7)

22. We represent the given information in a venn diagram.



As the number of elements in each set is 6.

$$2x + y + 3 = 16 \\ \Rightarrow 2x + y = 13 \quad \text{--- (1)}$$

As  $A \cup B \cup C = 30$

$$3x + 3y + 3 = 30$$

$$x + y = 9 \quad \text{--- (2)}$$

Solving (1) and (2), we get  $x = 4$  and  $y = 5$

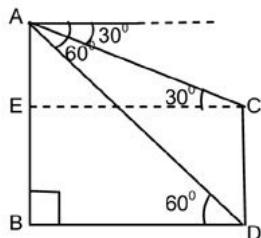
Therefore the number of elements in  $A \cap B$  is 7.

Ans: (7)

$$\begin{aligned} 23. \quad & 45.5 \left[ \frac{1}{31 \times 60} + \frac{1}{32 \times 59} + \frac{1}{33 \times 58} + \dots + \frac{1}{60 \times 31} \right] \\ &= 45.5 \left[ \frac{91}{31 \times 60} + \frac{91}{32 \times 59} + \frac{91}{33 \times 58} + \dots + \frac{91}{60 \times 31} \right] \\ &= \frac{45.5}{91} \left[ \left( \frac{1}{31} + \frac{1}{60} \right) + \left( \frac{1}{32} + \frac{1}{59} \right) + \left( \frac{1}{33} + \frac{1}{58} \right) + \dots + \left( \frac{1}{60} + \frac{1}{31} \right) \right] \\ &= \frac{2 \times 45.5}{91} \left[ \frac{1}{31} + \frac{1}{32} + \frac{1}{33} + \dots + \frac{1}{60} \right] \\ &= \frac{1}{31} + \frac{1}{32} + \frac{1}{33} + \frac{1}{34} + \dots + \frac{1}{60} \end{aligned}$$

Choice (C)

- 24.



Let us denote the tower and the building by AB and CD respectively.

It is given that  $BD = EC = 40$

$$\text{In } \triangle AEC, \tan 30^\circ = \frac{AE}{EC}$$

$$AE = \frac{40}{\sqrt{3}} \left[ \because \tan 30^\circ = \frac{1}{\sqrt{3}} \right]$$

$$\text{In } \triangle ABD, \tan 60^\circ = \frac{AB}{BD}$$

$$\Rightarrow AB = 40\sqrt{3} \left[ \because \tan 60^\circ = \sqrt{3} \right]$$

Height of the building  $CD = AB - AE$

$$= 40\sqrt{3} - \frac{40}{\sqrt{3}} = \frac{80}{\sqrt{3}} \text{ m}$$

Choice (D)

25. Let the selling price of each item be  $x$

As the overall profit is 20%

$$(CP_1 + CP_2) 1.2 = 2x$$

$$\therefore CP_1 + CP_2 = \frac{2x}{1.2} = \frac{5}{3}x$$

As the first item was sold at 50% profit,

$$1.5CP_1 = x$$

$$CP_1 = \frac{x}{1.5} = \frac{2}{3}x$$

$$\therefore CP_2 = \frac{5}{3}x - \frac{2}{3}x = x$$

Thus the second item was sold at cost price, i.e. no profit no loss.  
Choice (D)

26.  $2a = 3b = 5c \quad \text{--- (1)}$

Multiplying by 4, we get  $8a = 12b = 20c$

Similarly  $4c = 5d = 6e \quad \text{--- (2)}$

Multiplying by 5, we get  $20c = 25d = 30e$

$\therefore 8a = 12b = 20c = 25d = 30e = N$  (say)

$$\text{Now, } b = \frac{N}{12}, c = \frac{N}{20}, d = \frac{N}{8} \text{ and } e = \frac{N}{30}$$

$$\therefore \frac{bcd}{ae} = \frac{\left(\frac{N}{12}\right)\left(\frac{N}{20}\right)d}{\left(\frac{N}{8}\right)\left(\frac{N}{30}\right)} = d$$

Choice (D)

27. Let the number of bananas and chikus present in the pile be  $x$  and  $y$  respectively.

Using the number of fruits that were ripe,

$$70\% x + 45\% y = 60\% (x + y)$$

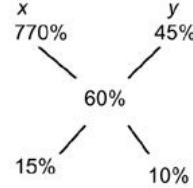
$$10\% x = 15\% y$$

$$\frac{x}{y} = \frac{3}{2}$$

#### Alternative Solution:

The alligations approach can directly be applied as shown below

Let the number of bananas and chikus be  $x$  and  $y$  respectively



$$\therefore \frac{x}{y} = \frac{15}{10} = \frac{3}{2}$$

Choice (A)

28.  $5 \times 6$  man days of work =  $9 \times 5$  women days of work.

$$\Rightarrow 2 \text{ men} = 3 \text{ women}$$

$$2 \text{ men} + x \text{ women} = (3 + x) \text{ women}$$

Considering the total work in woman days, we get

$$(3 + x)(5) = 9 \times 5$$

$$\Rightarrow x = 6$$

Ans: (6)

29. Let the ages of Aditi and her mother be denoted by  $ab$  and  $ba$  respectively.

Their ages, before 15 years were  $(10a + b - 15)$  and  $(10b + a - 15)$

$$\text{It is given that } (10a + b - 15) = \frac{(10b + a - 15)}{3}$$

$$\Rightarrow 3(10a + b - 15) = (10b + a - 15)$$

$$\Rightarrow 29a = 7b + 30$$

Since  $a$  and  $b$  are both single digit numbers, only  $a = 2$  and  $b = 4$  is a possible solution.

$\therefore$  Aditi's age is  $ab$  i.e., 24 and her mother's age is  $ba$ , i.e., 42.

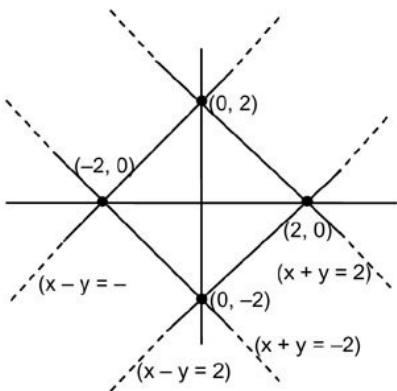
The sum of their present ages is 66. Ans: (66)

30. From  $|x + y| = 2$ , we get two equations  $x + y = 2$  and

$$x + y = -2$$

Similarly, from  $|x - y| = 2$ , we get  $x - y = 2$  and

$$x - y = -2$$



Combining these four equations in the  $x-y$  plane, we get a square of diagonal = 2 + 2 = 4 units

The area bounded by the above mentioned four lines is

$$\text{the area of the square of diagonal 4 units} = \frac{1}{2} \times 4 \times 4 \\ = 8 \text{ sq.units}$$

Choice (A)

31.  $\sin^2 \theta - 2\sin^3 \theta = (\sin \theta)(\sin \theta)(1 - 2\sin \theta)$   
now,  $(\sin \theta) + (\sin \theta) + (1 - 2\sin \theta) = 1$  (i.e., a constant)  
 $\therefore$  the product will be maximum when

$$\sin \theta = \sin \theta = 1 - 2\sin \theta \Rightarrow \sin \theta = \frac{1}{3}$$

Therefore the maximum value of the product is

$$\left(\frac{1}{3}\right)\left(\frac{1}{3}\right)\left(1 - \frac{2}{3}\right) = \frac{1}{27} = \frac{1}{A} \text{ (given)}$$

$$\therefore A = 27$$

Ans: (27)

32. Let the numbers of marbles with C be  $x$  and that with  $(A+C)$  be  $y$ . Let N be the number of marbles with B.

$$\text{It is given that, } N = \frac{88}{100}y \text{ and } N = \frac{112}{100}x$$

$$\therefore \frac{88}{100}y = \frac{112}{100}x \Rightarrow \frac{22}{25}y = \frac{28}{25}x, \text{ i.e., } N \text{ must be a multiple of 28 and 22. Now, the only common multiple of 28 and 22 between 1 and 500 is 308.}$$

$$\Rightarrow y = \frac{100}{88} \times 308 \text{ i.e., } y = 350$$

Hence the total number of marbles with all three of them is 350 + 308 = 658.  
Choice (A)

33. Let the salaries of Raghu, Ram and Rajan be  $2k$ ,  $3k$  and  $5k$  respectively.

Their total salary =  $2k + 3k + 5k = 10k$ .

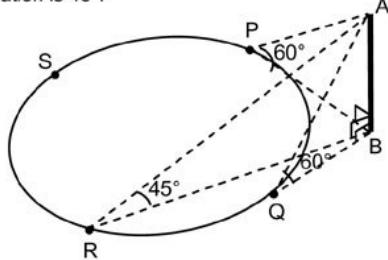
It is given that,  $10k = 720000$

$$\therefore 2k = 144000.$$

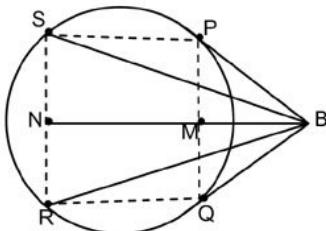
Therefore Raghu's monthly salary is ₹1,44,000

Ans: (144000)

34. In the figure below, AB represents the tower, points P and Q are those points from where the angle of elevation is  $60^\circ$  and R and S are those from where the angle of elevation is  $45^\circ$ .



If we take the top view, it gives us the following figure.



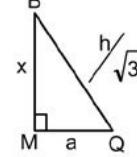
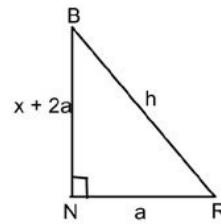
From the first figure, we get,  
 $AB = BR \tan 45^\circ = BQ \tan 60^\circ$

We can conclude that a perpendicular BN dropped from the foot of the tower (pt B) will bisect the lines PQ and SR. (as shown in the second figure).

Considering the side of the square as  $2a$  and the horizontal distance (BM) of the foot of the tower from the side PQ as  $x$ , and the height of the tower as  $h$ , we get

$$\left(\frac{h}{\sqrt{3}}\right)^2 = x^2 + a^2 \quad (\because BQ^2 = BM^2 + MQ^2) \\ \Rightarrow h^2 = 3x^2 + 3a^2 \quad (1)$$

$$\text{Similarly, in } \triangle BNR \\ h^2 = (x+2a)^2 + a^2 \quad (2)$$



equating  $h^2$ , we get

$$3x^2 + 3a^2 = (x+2a)^2 + a^2 \\ \Rightarrow 3x^2 + 3a^2 = x^2 + 5a^2 + 4ax \Rightarrow x^2 - 2ax - a^2 = 0 \\ \Rightarrow x = \frac{2a \pm \sqrt{4a^2 + 4a^2}}{2} = a \pm a\sqrt{2} \quad (3)$$

Since  $x > 0$ ,  $x = a + a\sqrt{2}$

Substituting  $x = a(\sqrt{2} + 1)$  in equation (1), we get

$$h^2 = 3a^2(3 + 2\sqrt{2}) + 3a^2; h^2 = 12a^2 + 6\sqrt{2}a^2 \\ \therefore h = a(12 + 6\sqrt{2})^{1/2}$$

$$\text{It is given that } 4a^2 = 800(12 - 6\sqrt{2}) \quad (4)$$

$$\Rightarrow a = 10\sqrt{2} \left(12 - 6\sqrt{2}\right)^{\frac{1}{2}}$$

$$\therefore h = 10\sqrt{2} \left(12 - 6\sqrt{2}\right)^{\frac{1}{2}} \left(12 + 6\sqrt{2}\right)^{\frac{1}{2}} \\ = 10\sqrt{2}(\sqrt{72}) = 120 \text{ m}$$

Note: Having arrived at (in (3))  $x = a(\sqrt{2} + 1)$  we can use the calculator to arrive at  $a \approx 26.51$  (from (4)) and  $x \approx 64$ . Now, using  $x$  and  $a$  in (2), gives

$$h^2 \approx 14396.5 \Rightarrow h \approx 119.99$$

From the choices, we can identify 120, i.e., choice (C).  
Choice (C)

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