

(Key and Solutions for AIMCAT1708)

Key

SECTION – I
SUB-SECTION: RC

1. D	5. C	9. 14	13. D
2. C	6. A	10. C	14. A
3. B	7. B	11. B	15. B
4. B	8. D	12. 2	16. 35

SUB-SECTION: VA

1. 46325	4. C	7. 4	10. 23
2. 24613	5. D	8. 5	11. 14
3. 63541	6. B	9. 3	12. 25

SECTION – II
SUB-SECTION: DI

1. C	4. B	7. A	10. A
2. 3	5. B	8. B	11. A
3. D	6. C	9. 3	12. 18

SUB-SECTION: LR

1. C	4. 27	7. 5	10. C
2. B	5. A	8. D	11. D
3. A	6. C	9. 70	12. A

SECTION – III: QA

1. C	8. D	15. B	22. B
2. C	9. 1728	16. 106	23. 272
3. B	10. 12	17. D	24. A
4. B	11. 375	18. 9	25. A
5. 16	12. 70	19. C	26. C
6. D	13. A	20. C	27. 6
7. 6	14. 4	21. 8	28. D

Solutions

SECTION – I
SUB-SECTION: RC

Solutions for questions 1 to 4:

Number of words and Explanatory notes for RC:

Number of words: 527

1. The Second American Party System refers to the Jacksonians becoming Democratic. The passage talks about the reason for this breakaway in the third paragraph of the passage.

Option A: The passage mentions that "Andrew Jackson's presidential victory over Adams in 1828 led to a renewal of overt party competition". However, the option mentions that this did not "sit well with the Democrats". This is not correct as the supporters of Jackson became Democrats.

Option B: The passage does not talk about Andrew Jackson's chances of winning the elections. Hence, this option is incorrect.

Option C: The third paragraph of the passage mentions that "The Jacksonian breakaway was a revolt from outside and down, directed against what, perhaps not Jackson himself, but certainly masses of his partisans, perceived as an oligarchic trend in the Republican succession". The supporters of Jackson perceived an oligarchic trend in the Republican succession and this resulted in the formation of Second American Party System. However, this option states that Andrew Jackson himself perceived this trend which is incorrect.

Option D: This option correctly mentions that the supporters perceived that power was concentrated only in the hands of a few in the Republican party. Therefore, this is the correct answer.

Choice (D)

2. The reasons for the supporters of John Quincy Adams to call themselves Whigs are mentioned in the second and the third paragraphs.

Option A: The third paragraph of the passage mentions that "Whig made its entry as an effort to evade the class impact of the Democratic attack on the National Republican establishment". Hence, this option is mentioned as a reason in the passage.

Option B: The second paragraph mentions that their naming was a "positive reference to the English champions of parliamentary liberties and the heroes of American independence". Hence, this option is also mentioned in the passage.

Option C: The passage mentions that "As the opening battles of the second party system made clear, control over federal executive conveyed massive advantages in securing and maintaining legislative majorities". However, it does not mention that this was a reason for naming themselves Whigs. Hence, this is not one of the reasons and is the correct answer.

Option D: According to the passage, "the stressed issue (fear of executive encroachment on the legislative branch), however real it may have been, was merely contingent to Whig principle". We can understand from this that they named themselves Whigs to highlight this issue of executive encroachment. Hence, this is also mentioned in the passage.

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

3. The passage mentions that the Republicans became dominant and this "interval of one-party government" is referred to as the Era of Good Feeling.

Option A: The passage mentions that the government was formed by one party ("interval of one-party government"). But we cannot say that no other party existed. Further, the passage mentions that Federalism "receded into political impotence" but does not mention whether it ceased to exist. Hence, this option cannot be inferred.

Option B: The passage talks about how Federalism lost its influence after the War of 1812. Because of this, "the Republicans swept on to a decade of unchallenged dominance". Hence, this option is correct.

Option C: The passage does not mention the number of minor parties. Hence, this cannot be the correct answer.

Option D: The last President of the Era of Good Feeling can be said to be John Quincy Adams ("...the last Republican administration, that of John Quincy Adams"). However, we cannot say that he was the president for the entire era.

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

4. The last sentence of the second paragraph reads "Had Adams defeated Jackson in 1828 and pushed to fulfilment the national programs set forth in the messages of his first term, his Jacksonian opponents might with equal logic have styled themselves Whigs while berating 'King John' for executive usurpation."

Option A: The preceding sentence states that "Whiggish slogans directed against 'King Andrew' were tactical weapons of a minority party". Hence, the Whigs were the minority and they called their president 'King Andrew'. The statement mentioned in the question implies that if John Quincy Adams won the elections, their opposition, i.e., the minority party would have accused Adams of encroaching on the legislature. Hence, the majority party would not have accused. Therefore, this is not the correct answer.

Option B: Irrespective of who became the president, the minority party might have accused him. Hence, this is the correct answer.

Option C: Any person elected as President might have been accused by the minority party and not by all the members of the legislature. Hence, this cannot be the correct answer.

Option D: While Andrew Jackson was accused of executive usurpation, the passage does not mention that John Quincy Adams was accused. The sentence mentioned in the passage only provides a hypothetical case. Therefore, this is not the correct answer.

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

Solutions for questions 5 to 8:

Number of words and Explanatory notes for RC:

Number of words: 800

5. Refer to para 5. Irreversible processes are at the heart of the arrow of time. Events happen in some sequences, and not in others. Furthermore, this ordering is perfectly consistent throughout the observable universe For certain kinds of processes, there seems to be an allowed order that is somehow built into the very fabric of the world. This makes choice C the correct answer.

Someday we might find a planet in a distant solar system that contains intelligent life, but nobody suspects that we will find a planet on which the aliens regularly separate (the indigenous equivalents of) milk and coffee with a few casual swirls of a spoon. Why isn't that surprising? It's a big universe out there; things might very well happen in all sorts of sequences. But they don't. From these few sentences, one cannot infer choices A, B and D. Choices A, B and D are out of scope.

Choice (C)

6. Someday we might find a planet in a distant solar system that contains intelligent life, but nobody suspects that we will find a planet on which the aliens regularly separate (the indigenous equivalents of) milk and coffee with a few casual swirls of a spoon. Why isn't that surprising? It's a big universe out there; things might very well happen in all sorts of sequences.

Option A: Why isn't that surprising? It's a big universe out there; things might very well happen in all sorts of sequences. So one might expect different laws to exist in different parts of the universe or on distant planets. Hence choice A is true and is the answer.

Option B: Choice B is contradicted by "Why isn't that surprising?" in para 5. Hence it is not the answer.

Options C and D: Choices C and D can be understood from the last two sentences of para 5: But they don't. For certain kinds of processes, there seems to be an allowed order that is somehow built into the very fabric of the world. The last few sentences of the penultimate para also stress on this point: Why is it like that? Why do we live in a universe where X is often followed by Y, but Y is never followed by X? However, they are not the logical implications of the sentence given in boldfaced in the passage.

Choice (A)

7. Certain events in the real world always happen in the same order. It's dive, splash, waves; never waves, splash, spit out a diver. Take milk and mix it into a cup of black coffee; never take coffee with milk and separate the two liquids. Sequences of this sort are called *irreversible processes*.

All of the irreversible processes that reflect time's arrow – we can turn eggs into omelets but not omelets into eggs, perfume disperses through a room but never collects back into the bottle, ice cubes in water melt but glasses of warm water don't spontaneously form ice cubes – share a common feature.

Choice A: Once toothpaste is removed from the tube, it would be extremely difficult to put it back into the tube. So choice A is an example of a virtually irreversible process and is not the answer.

Choice B: If a bar of chocolate is removed from a jar, it can be put back into the jar. So choice B is a reversible process and will not be mentioned as an example of an irreversible process. Hence Choice B is the answer.

Choice C: Making buttermilk from curds is an irreversible process similar to the example of turning eggs into omelets but not viceversa. So choice C is not the answer.

Choice D: Incidentally, F. Scott Fitzgerald's short story "The Curious Case of Benjamin Button" features a protagonist who is born as an old man and gradually grows younger as time passes. This may be an example of a movie being played in reverse. But, Birth and Death are irreversible. Hence choice D is not an answer to the question.

Choice (B)

8. Option A: None of us has met a character like the White Queen, who remembers what we think of as "the future" rather than (or in addition to) "the past." Choice A partly hints at the psychological arrow of time. But the omelet and egg example is not provided to illustrate the psychological arrow of time. Rather the example is used to illustrate the (thermodynamic) arrow of time, the direction of time in which the disorder or entropy increases. Hence choice A is out of scope of the given text and is not the answer.

Option B: Choice B is contradicted by the last two sentences of the last paragraph of the passage: And if everything in the universe evolves toward increasing disorder, it must have started out in an exquisitely ordered arrangement. This whole chain of logic, purporting to explain why you can't turn an omelet into an egg, apparently rests on a deep assumption about the very beginning of the universe: It was in a state of very low entropy, very high order. So choice B (disordered state of the universe at its beginning, highly ordered system later) is not true.

Option C: All of the irreversible processes that reflect time's arrow – we can turn eggs into omelets but not omelets into eggs – share a common feature: Entropy increases throughout, as the system progresses from order to disorder. Whenever we disturb the universe, we tend to increase its entropy. The reason why entropy wants to increase is deceptively simple: There are more ways to be disorderly than to be orderly, so (all else being equal) an orderly arrangement will naturally tend toward increasing disorder. So "Entropy decreases or stays constant" in choice C is not true.

Option D: The author gives the example of omelet and egg to illustrate that irreversible processes are at the heart of the arrow of time. A disorderly state cannot go back to an orderly state. Entropy increases in a system. Time cannot be reversed. So choice D is correct. Choice (D)

Solutions for questions 9 to 12:

Number of words and Explanatory notes for RC:

Number of words: 602

9. Refer to para 2.

Statement 1: Mr. Kenniff was not part of the Vespertine production team but he had a fondness for Bjork's songs. This makes statement 1 correct.

Statement 2: It has been mentioned in para 2 that Mr. Kenniff had the computer skills to tinker with Bjork's songs. In para 6, we are told that Mr. Kenniff is a skilled craftsman. The phrase "and the computer skills to tinker with them" draws attention. From this we cannot say that Mr. Kenniff was a skilled computer programmer. A computer programmer is a person who writes computer software. The term *computer programmer* can refer to a specialist in one area of computer programming or to a generalist who writes codes for many kinds of software.

Statement 3: The comparison in statement 3 cannot be inferred from para 2. Hence statement 3 is not correct.

Statement 4: Keith Kenniff remixed 'Hidden Place' a song from the album Vespertine. To enliven the moody number he added an introduction, modified the chorus and dropped in some tricky beats. 'I like taking someone else's ideas, bringing them into your own head and trying to make sense of them through your own interpretation,' Mr. Kenniff said. From this statement 4 is true.

Statement 5: Statement 5 is out of scope.

Statement 6: Statement 6 is not correct. There are remixes made by Mr. Kenniff for songs other than 'Vespertine'..... His 'Glow' mix of the song 'Headphones', taken from Bjork's 1995 album Post, benefits from a gorgeous keyboard counter melody and a strengthened rhythmic pulse. It is arguably as good as any of Bjork's commissions.

Ans: (14)

10. Option A: Refer to para 1. Fans with Internet access are **already listening to the tunes** of the long-awaited album by the pop singer Bjork. As part of an online marketing campaign for the album, remixed versions of three songs

are available at Bjork.com as free downloads. That was the official edition. So choice A is correct and is not the answer. Also refer to the penultimate para. Nor is it easy to name musicians who would be thrilled to have **fans fiddle with their precious tunes**. This might explain why, except for the occasional label-sponsored contest, **sites similar to Bjork Remix Web remain scarce**.

Option B: Mr. Keith Kenniff is a 19-year-old drummer in State College, Pa., with a fondness for Bjork's songs and the computer skills to tinker with them. Hence choice B is true and is not the answer.

Option C: Judging from Bjork Remix Web, a remarkable site at www.arktikos.com, Mr. Keith Kenniff has plenty of company. Mr. Kenniff's remake of 'Hidden Place' is one of 10 Vespertine tracks on the site. From this, we cannot infer the number of other remixes of "Hidden Place" on the internet. So choice C is not true and is the answer.

Option D: Overall Bjork Remix Web, a remarkable site at www.arktikos.com, contains nearly 800 remixes, submitted by about 160 different Internet contributors, of songs taken from Bjork's five solo albums, which could fill about 50 compact discs. Hence choice D is correct and is not the answer.

Choice (C)

11. The music industry is not wild about an Internet where music files are shared freely. **Nor is it easy** to name **musicians** who would be **thrilled to have fans fiddle** with their precious tunes. This might explain why, except for the occasional label-sponsored contest, **sites similar to Bjork Remix Web remain scarce**. This makes the first half of choice B correct. The second half of choice B is a correct implication from the lines: It is arguably as good as any of Bjork's commissions. Yet there are few places for Mr. Kenniff to ply this aspect of his trade. As the Napster controversy has shown, the music industry is not wild about an Internet where music files are shared freely.

Option A: Choice A cannot be inferred from the passage. There is a distinction between 'sharing free' and 'sharing freely'. 'sharing free' means one doesn't pay for it. 'sharing freely' means there is no problem with whom you share it with – i.e. you share without any limitation or sharing that happens with your approval and sharing that happens any number of times. "reluctant to share music files freely" does not imply that one is not open to sharing at all.

If choice A was changed to read: The music industry is reluctant to share music files freely, then it would have worked.

Option C: Choice C does not relate to the question. It is not about the number of fans. The context pertains to the fact that remixers of music and sites which promote remixing of music are scarce.

Option D: Choice D is a generalization. The comparison in choice D is out of scope.

Choice (B)

12. Statement 1: Statement 1 is not correct. Bjork was among the first pop stars to take the plunge into remix culture. Over the course of her solo career, this Icelandic singer has invited dozens of professional remixers to reimagine her songs. But we cannot infer the first part of Statement 1 (her songs are not interesting enough to attract the audiences). Therefore the cause-effect sequence in Statement 1 cannot be inferred to be true.

Statement 2: Statement 2 can be summarized from para 5 of the passage. Statement 2 is the correct answer.

Statement 3: Refer to the last paragraph. Even Bjork Remix Web has never been fully authorized by the singer's camp. In an e-mail message, Bjork's manager, Scott Rodger, said he was aware of the site. The singer's camp is aware of the site but has done nothing to put a stop to it. The passage does not clarify support or approval. So the first half of Statement 3 is incorrect. The second part of Statement 3 is incorrect. Tanaka said he was not worried about legal challenges over copyright violations.

Statement 4: Statement 4 is not the primary concern of the author. Statement 4 mentions a negative view towards remixing. The passage mentions remixing in a positive way and discusses how digital technology is being used to modify and distribute the existing music of singers.

Statement 5: Refer to para 5. In postmodern culture, in which **existing elements are routinely cut, pasted and blended into new works**, computers are providing handy tools for these transformations, and the Internet is supplying an eager audience for the results. Music is just one of the realms where this is happening. The author is talking in a broader context. This implies that transformation is happening in several other fields too. (*It can be "Editing of films", "The vision of 3D in cinematography", "EFX" etc.*) "this" in the statement does not refer to "remixes" or "music related software which helps in remixing". The author is pointing to digital technology when he mentions: The site's growth demonstrates how digital technology, abetted by the Internet, is turning fans from passive acolytes to active participants in the artistic process. But "this" does not refer to digital technology persay. Digital technology is just a tool. "This" refers to transformation of works of art (in any realm of postmodern culture) and a transformation in the role of fans: from passive acolytes to active participants in the artistic process. So statement 5 is incorrect.

Ans: (2)

Solutions for questions 13 to 16:

Number of words and Explanatory notes for RC:

Number of words: 733

13. The paragraph explains the importance of non-zero-sum bargains which lead to prosperity. The theme 'both sides should benefit' keeps on recurring in the para. The author also states that zero-sum (win-lose) thinking tends to dominate the popular discourse. The reason for this thinking as against the more important non-zero-sum bargain thinking is explained in choice D which aptly concludes the paragraph.

Option A: Choice A while highlighting the importance of "benefiting both" (more wealth after the transaction than he or she had before, it blesseth him that gives and him that takes) cannot continue with the penultimate sentence of the paragraph.

Option B: Choice B with the contrast conjunction "but" does not exactly fit in with the penultimate sentence of para 1 and cannot link with the first sentence of the second para. It needs more elaboration.

Option C: Choice C is more of an example and needs both a precedent and more substantiation. Choice (D)

14. The history of human prosperity, as Robert Wright has argued, lies in the repeated discovery of non-zero-sum bargains that benefit both sides. That's the trick by which the world gets rich. Yet it takes only a few sidelong glances at your fellow human beings to realize that remarkably few people think this way. Zero-sum (win-lose) thinking dominates the popular discourse, whether in debates about trade or in complaints about service providers.

Option A: You just **don't hear** people coming out of shops saying, "I got a great bargain, but don't worry, I paid enough to be sure that the shopkeeper feeds his family too." Zero-sum thinking dominates the popular discourse. People think that one person's gain is another person's loss and that's what the context implies. This makes choice A correct.

Option B: Choice B is incorrect. People don't actually say that..... That is not the way people actually think.

Most people saw capitalism (and therefore the market) as a necessary evil, *rather than* an inherent good. It is almost an axiom of *modern debate* that free exchange encourages and demands selfishness, (people take it for granted that free exchange is bad; but the author's view regarding it is the opposite, and that is what he implies in this sentence) whereas people were kinder and gentler **before their lives were commercialized**, that putting a price on everything has fragmented society and cheapened souls. Perhaps this lies behind the extraordinarily widespread view that commerce is immoral, lucre filthy and that modern people are good despite being enmeshed in markets rather than because of it – a view that can be heard from any Anglican pulpit at any time.

Hence, when the author says "people were kinder and gentler before" (para 3), he implies that people have started to think more from a commercial angle than before. People's commercial outlook has diminished society. Choices C and D do not apply.

Choice (A)

15. The zero-sum mistake was what made so many -isms of the past centuries so wrong. Mercantilism said that exports made you rich and imports made you poor, a fallacy mocked by Adam Smith when he pointed out that Britain selling durable hardware to France in exchange for perishable wine was a missed opportunity to achieve the 'incredible augmentation of the pots and pans of the country'.

When you look beyond Smith's sarcasm, you understand his view: Import is a part of an overall trade obligation. A country has to export what it is good at manufacturing. Imports establish connections with new parties who would then be enthused enough to buy things from the exporting country. So Adam Smith points to a conscious trade agreement – if a country does not import then would it be able to interest others in its own exports?

Option A: Choice A is a misdirection. In sarcasm, Britain missed the "opportunity" to achieve the 'incredible augmentation of the pots and pans of the country'. Actually, it did sell its durables to France, so it did not miss an opportunity.

Option B: The word "augmentation" means to strengthen, reinforce, to augment, to increase. Hence choice B is correct. Britain selling durable hardware to France in exchange for perishable wine was a missed opportunity to achieve the 'incredible augmentation of the pots and pans of the country'. Adam Smith was being sarcastic. To critics of Britain's imports of wines in exchange for exports of durables, he was pointing out (when you minus the sarcasm) that, had Britain not made that trade, their own items of manufacture would have simply accumulated in excessive, unsold, quantities, amounting to economic loss.

Option C: The comparison in choice C is not the implication from the quote of Adam Smith. So choice C is not the answer.

Option D: The author's disapproval cannot be ascertained through the said quote. Hence choice D is incorrect.

Choice (B)

16. Statement 1: Statement 1 is true. In para 1, the author pinpoints the thinking of people right now. In para 2, he discusses how that thinking has originated and how the zero-sum thinking was a mistake affecting various -isms of the past centuries. In para 3 he discusses the kind of impression that people have of the market (market is not a virtuous place.....,necessary evil,people were kinder before their lives were commercialized). He also elaborates on the working of commercialization or the evolution of the market, comparing the market with a biological system in para 4. He finally concludes that the market is not a necessary evil. Hence statement 1 can be gathered from an overall reading of the passage.

Statement 2: The last two sentences of the third paragraph and the quote as given in statement 2 describe people's misunderstanding of the free market and capitalism in general. The quoted sentence literally means that people take it for granted that free exchange is bad; but the author's view regarding it is the opposite, and that is what he implies in this sentence. Hence statement 2 is true.

Statement 3: The author points out (in para 2) that the idea that imports make you poor is a fallacy, so he is unlikely to disapprove of importing goods. From para 1, we know that the author does not disapprove of buying at bargain sales, but rather he dislikes the mentality of buyers who do not think in terms of the benefit to the sellers. Throughout the passage, the author demonstrates that he disapproves of zero-sum (i.e. win-lose) economic transactions. In para 2, he claims "some speculative markets in capital and in assets may be a zero-sum game." So it is likely he would disapprove of speculative markets. Hence statement 3 is not true.

Statement 4: Statement 4 can be inferred from para 2: Some speculative markets in capital and in assets may be a zero-sum game, but not markets in goods and services. (In the film Wall Street, Gordon Gekko adds that it's a zero sum game where somebody wins and somebody loses. He is not necessarily wrong about some speculative markets in capital and in assets but he is about markets in *goods and services*.)

Statement 5: From the third sentence of para 3, we can understand that statement 5 is not true. **Long before the credit crunch of 2008**, most people saw capitalism (and therefore the market) as a necessary evil, rather than an inherent good.

Hence statements 3 and 5 cannot be understood from the passage.

Ans: (35)

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

SUB-SECTION: VA

Solutions for questions 1 to 3:

- On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the paragraph. "we can think about these things" in sentence 6 links with the points mentioned in sentence 4 (We are not our feelings/ moods/ thoughts). So sentence 6 follows sentence 4. "we can think about these things separates us" in sentence 6 links with " Self-awareness enables us to stand apart – we are different from animals" in sentence 3. So sentence 3 follows sentence 6. we "see" ourselves – our self-paradigm" in sentence 3 links with "affects not only our attitudes we see other people" in sentence 2. So sentence 2 follows sentence 3. Sentence 5 (In short, it becomes our map.....) concludes the paragraph. Hence, 46325. Sentence 1 has a negative tone and does not fit with the remaining sentences. The sequence cannot be 32546 – there wouldn't be a link between 5 and 4.

Ans: (46325)

- On a careful reading of the sentences, it can be observed that sentence 2 introduces the background of the para: News writing (is closer to everyday speech and fancy words are best avoided). Sentence 2 is followed by sentence 4. "one- or two-syllable words" in sentence 4 reflects "everyday speech" in sentence 2. "use' instead of 'utilize', 'spit' instead of 'expectorate', and 'ringing' instead of 'tintinnabulation" in sentence 4 links with "fancy words are best avoided" in sentence 2. Sentence 6 takes us on another related train of thought (about how to start the news story) with "Also" and follows sentence 4. So, 246. Sentence 1 with the contrast conjunction 'but' follows sentence 6. "But when you're done with the writing, go back" in sentence 1 follows "go ahead as a way of getting started on the story" in sentence 6. Also " **re-think the lead**" in sentence 1 links with "**can't think** of any other way to start your story than with a question, quote or cliché **lead**" in sentence 6. "re-think the lead" in sentence 1 is followed by the courses of action mentioned in sentence 3. "Change a question into a declarative statement, add an opening sentence to set up a **quote** and ditch **the cliché**" in sentence 3 points to "start your story than with a question, **quote** or **cliché** lead" mentioned earlier in sentence 6. Sentence 3 follows sentence 1 and concludes the para. Hence 24613.

Sentence 5 just defines a 'cliché' and is not related to the other sentences in the paragraph. It is the odd man out.

Ans: (24613)

- On a careful reading of the sentences, it can be understood that sentence 6 is a general sentence that begins the

paragraph. It has a lot of proper nouns: Sculptural Ensemble, Constantin Brâncusi, Târgu Jiu, National League of Gorj Women, First World War and Central Powers. It also has the proper adjective: Romanian soldiers. Sentence 6 is followed by sentence 3. Sentence 3 tells us the three sculptures of the Sculptural Ensemble of Constantin Brâncusi. Sentence 5 (The first sculpture, the Table of Silence,.....) follows sentence 3. Sentence 4 talks about The Gate of the Kiss and follows sentence 5. Sentence 1 (Lastly, The Infinity Column) throws light on the last part of the Sculptural Ensemble and concludes the paragraph. Hence 63541.

Sentence 2 is the odd sentence out. It runs tangent to the text and talks about Brâncusi being "rediscovered" in Romania as a national genius. "restored, after a long period of degradation" in sentence 2 needs a precedent and more substantiation.

Ans: (63541)

Solutions for questions 4 to 6:

- On a careful reading of the sentences in the paragraph, we can understand that the first blank needs a synonym of 'panorama'. All the words except 'cavalcade' given in the options for the first blank (vista, diaorama, tableau) are near synonyms of 'panorama'. 'Tableau' means a vivid or graphic description. 'Diaorama' means a three-dimensional miniature or life-size scene in which figures, stuffed wildlife, or other objects are arranged in a naturalistic setting against a painted background. 'Cavalcade' means a ceremonial procession or display and will not exactly fill the first blank.

The second blank needs a synonym of 'disputed'. The National Highway called Narciso Ramos Highway was an area under dispute between the Armed Forces of the Philippines (AFP) and the Moro Islamic Liberation Front who were locked in a battle order there. So 'contested' and 'debated' will work for the second blank. 'Mootable' will also work as it refers to 'bone of contention' or 'disputable'. 'impugned' means to attack as false or questionable; challenge in argument. 'impugned' will not work for the second blank and hence choice A can be eliminated.

For the third blank, let us closely examine the text. The use of the contrast conjunction 'but' in the sentence "They fought bitterly in 1997 but signed a _____ of hostilities" accord" tells us that the blank can be filled with a word that is the opposite of 'fought'. So 'cessation' would be the correct word.

'cessation' means a bringing or coming to an end; a ceasing (of hostilities). 'secession' also means 'withdrawal' or 'break' and can work for the third blank. 'recrudescence' means to break out anew or come into renewed activity, as after a period of quiescence. 'catharsis' means a purifying or figurative cleansing of the emotions, a technique used to relieve tension and anxiety by bringing repressed feelings and fears to consciousness. Both 'recrudescence' and 'catharsis' will not work for the third blank and so choices B and D will be eliminated.

The fourth blank can take the words 'assuaging' and 'reconciling' (which mean to resolve or to make compatible, harmonious, or consistent). 'discomfiting' means to make uneasy or perplexed; disconcert. 'Tendentious' means marked by or favoring a particular point of view; partisan. We eliminate choices A and B as both 'discomfiting' and 'tendentious' will not fit the context.

For the last sentence or blank, one needs to read carefully the last few sentences of the paragraph. The fifth sentence mentions: It was far from the first time the Armed Forces of the Philippines (AFP) and the Moro Islamic Liberation Front have traded fire. They fought bitterly in 1997 but signed a cessation of hostilities in 1997 and since then peace talks have been punctuated (interrupted) with periodic skirmishing. So choice C which highlights a shift between 'hostilities' and 'negotiation' and helps explain a pattern in the recent past will best complete the paragraph. The last sentence given in choice D will need a precedent and more substantiation and can be a part of another paragraph. The last sentence in choice A (the fighting had spread) changes the tense and does not take the thoughtflow further. The

time reference in the last sentences of choice A and choice B (The tensions ebbed.....) are incomplete and the events mentioned therein run tangent to the text.

All the parts are mentioned correctly in choice C.

Choice (C)

5. The first blank can take the words 'has in store' or 'holds'. For the second blank, all the words given in the choices are likely.

For the third blank, we need a positive word. A birth of a healthy child has taken place. So a negative word like 'shattered' can be eliminated. One can eliminate choice B. One can say 'hopes are actualized or fulfilled'.

For the fourth blank, the best word would be 'deals' as the other words do not collocate with 'with these feelings'.

The fifth blank will take the word 'difficult'. One can say 'difficult to express'. One cannot say 'confusing to express', 'misleading to express' and 'inexplicit to express'.

The penultimate sentence of the paragraph says that parents begin to **suspect** that something is wrong. So their suspicions are confirmed after a few months. Hence the last sentence given in choice D will best complete the paragraph. The last sentence in choice B is out of scope. It needs a precedent and more substantiation. It can be a part of another paragraph. The last sentence in choice C is too general. We are talking about blindness and not any disability. Also, "the moment a child is born..." in choice C makes it incorrect. The parent has taken the baby home and begins to suspect that something is wrong some months later. The last sentence in choice A needs a precedent, like the one provided in choice D.

All the parts are mentioned correctly in choice D.

Choice (D)

6. From the clues mentioned in the second sentence of the paragraph (written by a seventh grader: clarity and concision are lacking; the connective tissue is either anemic or absent; and citation is hit or miss), we can infer that the first blank needs a negative word. The para also mentions that Wikipedia editing is a problem. All the words for the first blank given in the choices are equally likely to complete the blank. **Lumpy** means thickset or cumbersome. **Cumbersome** means difficult to handle, use or deal with. **Chunky** means thick and short and containing small lumps.

The facts may be _____, but the connective tissue is either anemic or absent. This tells us that the second blank in the paragraph needs a positive word meaning 'strong'. All words for the second blank except 'strapping' will fit the context. In case of language, style, etc **sinewy** means vigorous; forceful. **Sturdy** means marked by resoluteness or determination or firm or vigorous. **Robust** means strong, vigorous etc. **Strapping** is used to describe a person (and not 'facts'). Strapping means having a sturdy muscular physique; robust.

The third blank in the para needs an antonym of 'entirety' – the vast majority of Wikipedia edits consist of deletions and additions rather than of attempts to reorder paragraphs or to shape an entry as a whole. All words for the third blank except 'stochastically' will fit the context. **Piecemeal** means in pieces; by a small amount; in stages; apart. **Gradationally** would indicate a series of gradual, successive stages or degrees. **Stochastically** means "of, relating to, or characterized by conjecture, conjectural". It does not fit the context. Choice C can be eliminated. 'Fragmented' also does not collocate with the words 'reading it'.

With reference to the last blank, the analogy in the last sentence in choice A is wrong – according to the passage, Wikipedia is not 'well-crafted'. The last sentence in choice C is too negative, as it states that Wikipedia will never improve, whereas the passage takes a more optimistic tone ('work in progress'). The last sentence in choice D can be eliminated, as the paragraph does not mention any 'conflicting' edits. The last sentence in choice B describes the unevenness of Wikipedia succinctly.

All the parts are mentioned correctly in choice B.

Choice (B)

Solutions for questions 7 to 9:

7. In sentence 1, there is a tense error. "has been paralysing" is incorrect. It should read "has paralysed".

In part 2, the adverb 'rapidly' is misplaced. The adverb 'rapidly' modifies the verb 'immunizes' and should be placed before it. The part should read: The overriding priority now is to rapidly immunise all children around the affected area

Part 3 should read: **As** recently as 2012

Part 4 is error-free.

The adverbs 'still' and 'only' in sentence 5 are misplaced. Sentence 5 should read: Until the Nigeria announcement, Pakistan and Afghanistan were the **only** remaining countries **still** reporting cases of the infection this year.

Ans: (4)

8. Sentence 1 needs the sentence construction 'as as'. Commas are also needed on both sides of "all grown from your own body cells". The part should read: "..... or a new set of kidneys, all grown from your own body cells, was **as** commonplace as

In sentence 2, 'running down' is incorrect. The part should read: by running a marathon with your school friends. Sentence 3 has errors of punctuation. The sentence should read: Imagine, in other words, a world in which ageing had been abolished.

Sentence 4 needs the contrast conjunction 'but' in place of 'and'. The part should read: That world is not yet on offer **but** a semblance of it might be one day.

Sentence 5 is error-free.

Ans: (5)

9. In sentence 1, 'among' needs to be replaced with 'between'. In sentence 2, 'comprise of' is incorrect. The part should read: Ceres is estimated to comprise approximately one third of the mass

Sentence 3 is error-free.

Sentence 4 has an error of subject-verb agreement. The plural noun 'emissions' will take a plural verb 'were'. The part should read: emissions of water vapor **were** detected from several regions of Ceres.

In sentence 5, the word 'hallmark' has to be preceded by the indefinite article 'a'. The part should read: large bodies in the asteroid belt do not typically emit vapor, **a** hallmark of comets.

Ans: (3)

Solutions for questions 10 to 12:

10. In sentence 1, the phrasal verb 'set something back' means hinder or obstruct. Sentence 1 is correct.

Sentence 2 has an incorrect usage of the word 'set'. In sentence 2, the correct phrasal verb usage should be "set me off" which means to make suddenly or demonstrably angry.

Sentence 3 also has an incorrect usage of the word 'set'. In sentence 3, the usage 'set great store for' is incorrect in the given context. The correct idiom is 'set great store by'. This means to regard as valuable or worthwhile.

Sentence 4 has a correct usage of the word 'set'. The phrasal verb "set up" here means to put (oneself) forward as; claim to be.

Sentence 5 has a correct usage of the word 'set'. In sentence 5, the phrasal verb 'set off' means 'counteract, counterbalance or compensate for'.

Ans: (23)

11. The usage of the word 'face' is incorrect in sentences 1 and 4. Sentence 1 has an incorrect usage of the word 'face'. In sentence 1, the required idiom is "insult me to my face". This means "in the view or hearing of".

The phrasal verb 'face down' in sentence 2 means to attain mastery over or overcome by confronting in a resolute, determined manner: face down an opponent in a debate.

In sentence 3, "face up" is a phrasal verb which means to confront an unpleasant situation with resolution.

Sentence 4 has an incorrect usage of the word 'face'. In sentence 4, the correct idiom is "flew in the face" and not "flew off the face". The idiom "flew in the face" means "disregard, defy or go against".

In statement 5, "to do an about face" means to reverse one's opinion or course of action.

Ans: (14)

12. The usage of the word 'turn' is incorrect in sentences 2 and 5.

In sentence 1, the phrasal verb 'turn to' means 'to begin work'.

In sentence 2, the correction would be 'turn his phone in' which means to 'hand in'.

In sentence 3, the idiom 'turn a hair' means to become afraid or upset'. 'not turn a hair' means 'to not show any emotion when one is told something bad or when something bad happens.'

In sentence 4, the idiom 'turn the scales' means 'to offset the balance of the situation'. The idiom 'turn of phrase' in sentence 4, refers to a distinctive style of expression, idiom, term, choice of words, style etc.

In sentence 5, it should read "The turkey was cooked to a turn." The idiom 'cooked to a turn' is a term used for solid stuff (not for liquids and gravies) and it means "cooked to the right degree, perfectly". "cooked by a turn" is incorrect usage.

Ans: (25)

Solutions for questions 5 to 8:

Let the total revenues of the five companies in 2014 be x and the total revenues in 2015 be y .

$$\begin{aligned} 5. \quad \text{Revenues of A in 2014} &= 0.1667x \\ \text{Revenues of A in 2015} &= 0.1667x \times 1.15 = 0.1917x \text{ (since the \% growth is 15\%)} \\ \text{However, Revenues of A (from the second pie chart)} \\ &= 0.1662y \\ \text{Therefore, } 0.1662y &= 0.1917x \\ \text{Required ratio} &= \frac{x}{y} = \frac{0.1662}{0.1917} = 0.867 \quad \text{Choice (B)} \end{aligned}$$

6. Revenue of A (in ₹ mn) in 2015 = 150

$$\text{Revenue of A in 2014} = \frac{150}{1.15} = 130.43$$

Revenue of the five companies in 2014

$$= \frac{130.43}{0.1667} = 782.45 \quad \text{Choice (C)}$$

7. Given $0.1833x + 0.2775y = 180$

$$\text{Also, } \frac{x}{y} = 0.867 \Rightarrow x = 0.867 \times y$$

$$\text{Therefore, } 0.1833 \times 0.867y + 0.2775y = 180$$

$$\Rightarrow y = 412.47 \text{ and } x = 357.55$$

$$\text{Revenue of E in 2014} = 0.15 \times 357.55 = ₹ 53.63 \text{ mn.} \quad \text{Choice (A)}$$

8. The increase in revenue of A

$$= 0.15 \times 0.1667x = 0.025x$$

The increase in revenue of B

$$= 0.2775 \times \frac{x}{0.867} - 0.2667x = 0.0534x$$

The increase in revenue of C

$$= 0.2124 \times \frac{x}{0.867} - 0.2333x = 0.0117x$$

The increase in revenue of D

$$= 0.1749 \times \frac{x}{0.867} - 0.1833x = 0.018x$$

The increase in revenue of E

$$= 0.1691 \times \frac{x}{0.867} - 0.15x = 0.045x$$

Hence, the increase in revenue for B is the highest.

Choice (B)

Solutions for questions 9 to 12:

The players from Germany scored 8 goals in IHL. Player 7 and Player 2 could have scored 8 goals but their number of goals in the other leagues will not add up. Player 6 and one among Player 4, Player 8 and Player 9 also will have 8 goals in IHL. Among these players, Player 6 and Player 9 will satisfy the number of goals scored by players from Germany. For no other combination of players, this is possible. Hence, Player 6 and Player 9 are from Germany.

The players from Australia scored 8 goals in AHL. If either of Player 4 or Player 8 is from Australia, then Player 7 must also be from Australia (for the total number of goals in AHL to become 8). However, for any of these cases, the number of goals in the other leagues will not satisfy. Another possibility is Player 5 with Player 1 or Player 9. Player 5 and Player 1 can be from Australia. But Player 5 and Player 9 cannot be from Australia. The other possibilities are also not possible. Hence, Player 5 and Player 1 are from Australia.

Player 7 cannot be from South Korea (since he scored 8 goals and no combination of players with this player will give the required number of goals). Hence, Player 7 has to be from India. The number of goals remaining for India (removing Player 7) will

Difficulty level wise summary - Section I	
Sub Section: VA	
Level of Difficulty	Questions
Very Easy	-
Easy	-
Medium	4, 5
Difficult	9, 10, 11, 12
Very Difficult	1, 2, 3, 6, 7, 8

SECTION – II

SUB-SECTION: DI

Solutions for questions 1 to 4:

We can tabulate the availability of each person for different shifts from the graph:

Shift I	Shift II	Shift III	Shift IV	Shift V	Shift VI
Siva	Siva	Rishi	Sravan	Tarun	Tarak
Jiva	Sashi	Jiva	Roshan	Roshan	Satish
Gautam	Jiva	Balu	Rishi	Rishi	Roshan
Gaurav	Balu	Amar	Harish	Harish	Ankit

We can see that for Shift VI, only three persons are available. Hence, they have to be assigned Shift VI. Since a person cannot work in consecutive shifts, Tarak, Satish and Roshan cannot work in Shift V. Hence, Tarun, Rishi and Harish will be in Shift V. Similarly, Rishi and Harish cannot be in Shift IV and Sravan, Roshan and Ankit will be in Shift IV.

If Siva, Gautam and Gaurab are in Shift I, Shashi, Jiva and Balu will be in Shift II. In this case Jiva and Balu cannot be in Shift III and hence, this case is not possible (since there will only be two people available for Shift III).

If Jiva, Gautam, Gaurav are in Shift I, Siva, Shashi and Balu can be in Shift II. In Shift III, Rishi, Jiva and Amar can be in Shift III. This is the only possible case.

Hence, Ranjith can select in only one way which is given below:

Shift I	Shift II	Shift III	Shift IV	Shift V	Shift VI
Jiva	Siva	Rishi	Sravan	Tarun	Tarak
Gautam	Sashi	Jiva	Roshan	Rishi	Satish
Gaurav	Balu	Amar	Ankit	Harish	Roshan

1. Sravan, Roshan and Ankit will work in Shift IV.
Choice (C)
2. Three workers, Jiva, Rishi and Roshan, will work in more than one shift.
Ans: (3)
3. Rishi will be assigned Shift III and Shift V.
Choice (D)
4. The workers in Shift II will not work in any other shift.
Choice (B)

9, 11 and 2 in the three leagues. To have 2 goals in IHL, Player 2 and Player 3 will satisfy. The other possibility is Player 4 and Player 8 which will not satisfy for goals in other leagues. Hence, Player 2 and Player 3 are from India and the rest are from South Korea.

The following table gives the country that each player is from (with each country represented by its initial letter):

Country	Player									
	1	2	3	4	5	6	7	8	9	10
Country	A	I	I	SK	A	G	I	SK	G	SK

9. Three players are from India. Ans: (3)
10. Player 5 scored the highest number of goals across the three leagues. He belongs to Australia. Choice (A)
11. Player 6 and Player 9 belong to the same country. Choice (A)
12. Player 4 scored 14 goals, Player 8 scored 11 goals and Player 10 scored 18 goals. Hence, the highest number of goals will be 18. Ans: (18)

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

SUB-SECTION: LR

Solutions for questions 1 to 4:

Given that Priya uses Airtel and Manoj uses Idea. Rekha and Latha use the same network and it has to be Vodafone (since Priya is using Airtel). Since Priya and Latha are using different networks, the duration of Priya's call to Latha must be 4 min and she must have been charged ₹3 per minute.

Since Neha's call was charged ₹12, Neha should also be using Idea. Her call must be of a duration of 6 minutes. Therefore, Priya and Usha should be using Airtel.

1. Usha uses Airtel. Choice (C)
2. Option B is definitely true. Choice (B)
3. Neha and Manoj talked for the longest time. Choice (A)
4. The total cost incurred by all of them together will be $3 + 12 + 12 = 27$. Ans: (27)

Solutions for questions 5 to 8:

Given that Raju is standing in front of Nani. From (iv), the person in the middle of the queue is standing behind both Raju and Nani. Hence, Raju and Nani must be in two of the first three positions. From (i), Raju was not able to see Mr. Nepal. Hence, Raju cannot be in the first position (since the person in the first position will be able to see Mr. Nepal irrespective of his height). Therefore, Raju is not in the first position. Hence, Raju must be in the second position and Nani must be in the third position.

From (iii), Uday is immediately behind Sravan. Sravan cannot be in the first position (since Raju is in the second position). Sravan cannot be in the 4th position as well (since the person in the middle was not able to see Mr. Nepal but Sravan was able to see Mr. Nepal). Sravan cannot be in the 6th position since Uday is not in the last position. Hence, Sravan must be in the 5th position and Uday must be in the 6th position.

Since Sravan is in the 5th position and is able to see Mr. Nepal, he must be at most the third tallest. If he is the third tallest, all

the people shorter than him must be in front of him (since four people are in front of him and four people are shorter than him). However, from (vi), one person shorter than him is behind Sravan. Hence, Sravan cannot be the third tallest. He must be either the second tallest or the tallest.

From (v), at least four people are able to see Mr. Nepal. The person who is first will be able to see Mr. Nepal. Sravan was able to see. Raju in the second position was not able to see Mr. Nepal and the person in the middle (4th) was not able to see Mr. Nepal. Even if Nani is able to see Mr. Nepal, at least one person behind Sravan must be able to see Mr. Nepal. Hence, Sravan cannot be the tallest (if he is the tallest, no one behind him will be able to see Mr. Nepal). Therefore, Sravan is the second tallest.

From (vi), the tallest person is not standing in the end. Hence, Uday must be the tallest person and he will be able to see Mr. Nepal. Anyone behind Uday will not be able to see Mr. Nepal. Therefore, Nani must be able to see Mr. Nepal.

From (ii), Mani cannot be in the last position (if he is last, even if he is not in the queue, no additional person will be able to see Mr. Nepal). Mani also cannot be 4th (this will also violate condition (ii)). Hence, Mani will be the first person in the queue. Hari can be in the fourth position or the seventh position. If Hari is in the seventh position, he will be standing next to the tallest person (Uday). This will violate condition (iii). Hence, Hari must be in the 4th position and Guru must be in the last position.

From (iii), Nani must be the fourth tallest person. Raju and Mani, who are in front of Nani, must be shorter than him. Further, Raju must be shorter than Mani. Raju can be the seventh tallest (i.e., shortest) or the sixth tallest. If Raju is the sixth tallest, Mani must be the fifth tallest. In this case, Hari has to be the shortest person. This will violate (iii). Hence, Raju must be the shortest and Mani can be either the fifth tallest or the sixth tallest. Hari also can be either the fifth tallest or the sixth tallest. Guru must be the third tallest.

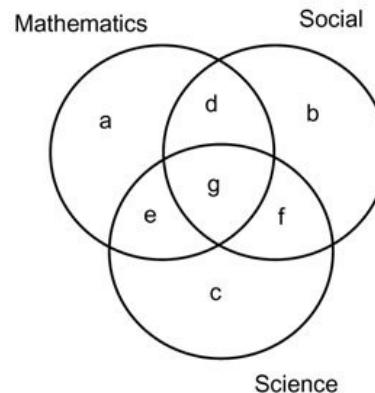
The following table provides the arrangement and the heights (with 1 representing the tallest person and 7 representing the shortest person):

Position	7	6	5	4	3	2	1	Mr. Nepal
Person	Guru	Uday	Sravan	Hari	Nani	Raju	Mani	
Height	3	1	2	5/6	4	7	6/5	

5. Uday is the tallest person. Choice (A)
6. Mani is the first person in the queue. Choice (C)
7. Hari must be the fifth tallest person and Mani, the sixth tallest. Hence, five people are taller than Mani. Ans: (5)
8. Nani is definitely taller than Hari but we cannot say determine whether Mani is taller than him. Hence, the answer cannot be determined. Choice (D)

Solutions for questions 9 to 12:

The Venn diagram shows the distribution of the subjects for different classes. Let a_8 represent the number of students who like only Mathematics in 8th class, a_9 in 9th class and a_{10} in 10th class.



- From (i), $d_8 = e_8 = f_8$
 $d_9 = e_9 = f_9$
 $d_{10} = e_{10} = f_{10}$ ----(1)
- From (ii), $a_8 = f_9 + g_9$ ----(2)
- From (iii), $g_8 + g_9 + g_{10} = 40$ ----(3)
- From (v), $a_{10} > a_9 > a_8$ ----(4)

From (iv) and (i), we know that the total strength is 100 and every value from a to g for all classes must at least be 10. Therefore, the maximum value that a_8 can have is 40 (only then will b_8 to g_8 be at least 10) and the minimum value that a_8 can have is 20 (since $a_9 = f_9 + g_9$). However, from (v), a_8 must be 20, a_9 must be 30 and a_{10} will be 40. In all three classes, $d = e = f = 10$. From (2), g_9 will be 10. Since g_9 is 10, and g_{10} has to be 10, g_8 will be 20 (from (3)).

The following table gives the values of a, b, c, d, e, f and g for the three classes:

Class	a	b	c	d	e	f	g
8	20	10/20	20/10	10	10	10	20
9	30	10/20	20/10	10	10	10	10
10	40	10	10	10	10	10	10

9. The highest will be for Mathematics in Class 10. Number of students who like mathematics in class 10 = $40 + 10 + 10 + 10 = 70$
 Ans: (70)
10. If the number of students in class who like only Social is 20, then the number of people who like science will be $10 + 10 + 10 + 20 = 50$.
 Choice (C)
11. The number of students that like both Science and Social in Class 8 is 30. Therefore, only option D is correct.
 Choice (D)
12. The number of students who like all three subjects is the highest in Class 8.
 Choice (A)

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

SECTION – III: QA

Solutions for questions 1 to 28:

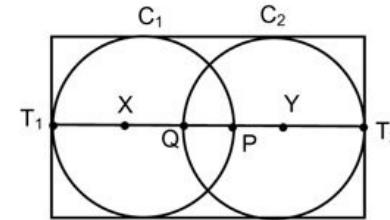
1. $(3m + 4w) \times 4 = (4m + 2w) \times 6$
 $\Rightarrow 12m + 16w = 24m + 12w$
 $\Rightarrow 4w : 12m$
 $\Rightarrow w = 3m$
 Thus one woman-day is equal to three man-days
 $3m + 4w = 15m$
 Thus, the work requires $15 \times 4 = 60$ man-days
 $9m + 2w = 15m$
 $\text{Required days} = \frac{60}{15} = 4$ Choice (C)
2. If each side of a triangle is increased by 20%, its inradius and circumradius will also increase by 20% each. So, the required product becomes $(1.2)(1.2)$, i.e., 1.44 times the original product.
 \therefore The product of the circumradius and the inradius increases by 44%. Choice (C)
3. We have to evaluate A_i for successive values of i , for which we need to evaluate $f(A_{i-1})$. The first value of n (i.e., 0), the corresponding value of A (i.e., A_0) the subsequent values of i and the corresponding values of A_i are tabulated below.

i	$f(A_{i-1})$	A_i
0	-	13
1	26	52
2	49	98
3	95	190
4	187	374
5	371	742
6	739	1478

$$\therefore A_6 = 1478$$

Choice (B)

4. The area of the rectangle (enclosing the given assembly of circles) will be least when all four sides of the rectangle touch the circles, as shown in the figure below.



$$XP = YQ = 3 \text{ cm}$$

$$PQ = 2 \text{ cm}$$

$$XY = XP + QY - PQ = 4 \text{ cm}.$$

Let T_1 and T_2 be the points of contact of circle C_1 and the breadth of the rectangle, and circle C_2 and the other breadth of the rectangle respectively,

$$\therefore T_1 T_2 = T_1 X + XY + T_2 Y \\ = 3 + 4 + 3 = 10 \text{ cm.}$$

$$\text{Breadth of the rectangle} = 3 + 3 = 6 \text{ cm.}$$

$$\therefore \text{perimeter of the rectangle} \\ = 2(10 + 6) = 32 \text{ cm.}$$

Choice (B)

5. $\text{Rem}\left(\frac{81^{82}}{17}\right) = \text{Rem}\left(\frac{-4^{82}}{17}\right)$, since $\text{Rem}\left(\frac{81}{17}\right) = -4$
 $= \text{Rem}\left(\frac{(-4^2)^{41}}{17}\right) = \text{Rem}\left(\frac{16^{41}}{17}\right) = -1$

Hence, required remainder = 16

Alternative Solution:

$$\begin{aligned} \text{Rem}\left(\frac{81^{82}}{17}\right) &= \text{Rem}\left(\frac{81^2 \cdot 81^{80}}{17}\right) \\ &= \text{Rem}\left(\frac{81^2}{17}\right) \times \text{Rem}\left(\frac{81^{80}}{17}\right) = 16 \times 1 \\ \therefore \text{Rem}\left(\frac{81^{80}}{17}\right) &= \text{Rem}\left[\frac{81^{(17-1)5}}{17}\right] = 1 \end{aligned}$$

By Fermat's theorem $\text{Rem}\left(\frac{a^{(p-1)k}}{p}\right) = 1$, where p is a prime number and a is not a multiple of p .

So, the required remainder is 16.

Ans : (16)

6. Given relations are:

$$R = \{(1, 1), (1, 3), (2, 2), (3, 1), (3, 3)\}$$

$$S = \{(1, 1), (1, 2), (2, 2), (2, 1), (2, 3), (3, 2), (3, 3)\}$$

$$R \cap S = \{(1, 1), (2, 2), (3, 3)\}$$

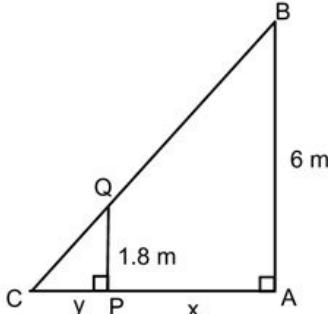
$$R \cup S = \{(1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3)\}$$

Clearly S is not an equivalence relation as $(1, 2), (2, 3) \in S$ but $(1, 3) \notin S$.

\therefore Both $R \cap S$ and $R \cup S$ are equivalence relations.

Choice (D)

7. Let AB be the lamp post and PQ be the man. Let CP be the shadow.



Let x be the distance between man and the lamppost. and y be the length of the shadow PC.

$\triangle ABC$ and $\triangle PQC$ are similar. AB is $\frac{6}{1.8}$ or $\frac{10}{3}$ times PQ.

$\therefore x + y$ is $\frac{10}{3}$ times y or x is $\frac{7}{3}$ times y , irrespective

matter what x is (i.e. even if x continuously changes)

\Rightarrow rate at which CP changes = $\frac{3}{7} \times$ rate at which x increases.

\Rightarrow The rate at which the length of the shadow increases

$$= \frac{3}{7} \times \text{speed of man} = \frac{3}{7} \times 14 = 6 \text{ m/min}$$

Alternative Solution:

Since the man's initial position is not specified, we can take him to initially be at the bottom of the lamp post, in which case, the length of his shadow would be zero. Now, let the man walk for one minute, i.e., 14 m away from the lamp post. Now, the length of his shadow can be shown to be 6 m (using the similar triangles approach, as given above). Hence, in one minute the length of the shadow increased by 6 m. That is, the rate of increase is 6 m/min.

Ans: (6)

8. Required Probability = probability of (2 green balls + 3 green balls + 4 green balls)

$$= \frac{{}^6C_2 {}^8C_2 + {}^6C_3 {}^8C_1 + {}^6C_4 {}^8C_0}{14C_4}$$

$$= \frac{15(28) + 20(8) + 15(1)}{1001} = \frac{595}{1001} = \frac{85}{143}$$

Alternative Solution:

The required probability = 1 – probability of (0 green balls + 1 green ball)

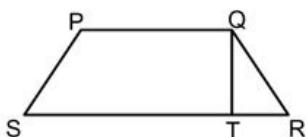
$$= 1 - \frac{({}^6C_0 \cdot {}^8C_4 + {}^6C_1 \cdot {}^8C_3)}{14C_4} = 1 - \frac{(1 \times 70 + 6 \times 56)}{1001}$$

$$= 1 - \frac{406}{1001} = \frac{595}{1001} = \frac{85}{143}$$

9. The smallest cube that can be constructed with the blocks of dimension $4 \text{ cm} \times 3 \text{ cm} \times 2 \text{ cm}$ will have an edge equal to LCM (4, 3, 2) i.e., 12 cm. Hence its volume is 12^3 i.e., 1728 cu.cm.

Ans: (1728)

- 10.



As QT is perpendicular to RS.

$\angle PQT = 90^\circ$ and $\angle QTR = 90^\circ$

$\angle TQR = \angle PQR - \angle PQT = 45^\circ$ and hence $\angle TRQ = 45^\circ$.

Therefore,

$\therefore TR = QT = 4$

$ST = RS - TR = 16 - 4 = 12$

Ans : (12)

11. As A and B travel with equal speed, the time taken by the train to overtake A or B is the same. Also as it takes 10

seconds to overtake A, the same time it will take to overtake B. So, the extra 15 seconds taken by it is to cover the distance between A and B.

But as A and B are also moving along with the train, relative speed = $30 - 5 = 25 \text{ m/s.}$ ($108 \text{ kmph} = 30 \text{ m/sec}$)

Hence, it travels, $25 \times 15 = 375 \text{ m,}$ which is the distance between A and B.

Ans : (375)

12. If the father attends the party each child can either attend the party or not attend the party i.e., each child has 2 options. Therefore for 6 children we get

$$\Rightarrow (2)(2)(2)(2)(2)(2) = 2^6 = 64 \text{ ways}$$

If the mother attends the party, the total numbers of ways = $2 \times 2 \times 2 \times 2 = 2^4$ (as B or C won't attend the party with their mother)

F doesn't go when none of A or D attend

$\Rightarrow F$ does not go with B, C, E

(with Father) $\Rightarrow 2 \times 2 \times 2 \Rightarrow 8$ ways should be removed from 1st case

(with Mother) $\Rightarrow 2$ ways should be removed from 2nd case as F will not go with E.

$$\Rightarrow \text{Required number of ways} = 64 + 16 - 8 - 2 = 70$$

Alternative Solution:

Considering only A, D, F, and using the condition (b), we have the following cases

(None of A, D, F); (F, A); (F, D); (F, A, D); (A); (D); (A, D); i.e., 7 ways.

Now considering B, C and E

(i) with father: each of B, C and E can either go or not go i.e., $2 \times 2 \times 2 = 8$ ways

(ii) with mother: E can either go or not go, i.e., in 2 ways.

Hence, B, C, E have $8 + 2 = 10$ ways of going and A, D, F have 7 ways

$$\therefore \text{Total ways} = 10 \times 7 = 70 \text{ ways.}$$

Ans: (70)

13. The volume of water that fills up the pipe in 3 minutes is $= \pi r^2 (400) \text{ cm}^3$

$$= \frac{22}{7}(7)(7)(400) \text{ cm}^3 = (22)(7)(400) \text{ cm}^3$$

The time taken is 3 minutes

Let the speed of the water in the inlet pipe be S (cm/sec)

$$\therefore (100)(3)(60)S = (22)(7)(400)$$

$$\Rightarrow S = \frac{22(7)(4)}{3(60)} = \frac{154}{45} \text{ cm/sec}$$

$$\approx 3.42 \text{ cm/sec}$$

Choice (A)

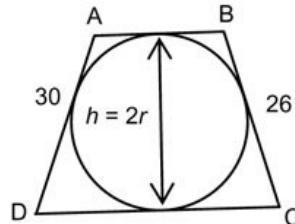
14. $16200 = 2^3 \times 3^4 \times 5^2$

The number of prime factors is 3 (i.e. 2, 3, 5)

Then, the number of ways in which it can be expressed as a product of 2 co-primes = $2^{3-1} = 2^2 = 4$ ways.

Ans : (4)

15. The size of the plot will be the minimum when all the four sides of the plot (i.e. trapezium) touch the pool.



Let the oblique sides be AD and BC. Since the circle is inscribed in ABCD, the sum of the lengths of opposite sides will be equal.

$$\text{Hence, } AB + DC = AD + BC = 30 + 26 = 56 \text{ cm}$$

Also, height of the trapezium = $h = 2r =$ diameter of circle = $12 \times 2 = 24 \text{ m}$

$$\text{Hence area of trapezium} = \frac{1}{2} (AB + DC) \times h = \frac{1}{2} \times 56 \times 24 = 672 \text{ sq.m}$$

Choice (B)

16. Let the two digit number be $10x + y$

$$\therefore 10x + y = x + y^2$$

$$\Rightarrow 9x = y^2 - y$$

$$\Rightarrow 9x = y(y-1)$$

As x and y are single digit and $x \neq 0$, and both y and $(y-1)$ cannot be simultaneously multiples of 3, either y or $y-1$ must be equal to 9.

But y is a single digit, therefore $y-1 \neq 9$

$$\therefore y = 9, \text{ and } x = y-1 = 9-1 = 8$$

\therefore The number is 89

$$\therefore \text{The required sum} = 89 + 8 + 9 = 106$$

Ans : (106)

17. Evaluating the first three choices does not result in an integer. Hence choice (D) follows. Choice (D)

18. The number of children with 1 or more pencils is 2^{n-1} . This number can be considered to represent all the first pencils that the children have, (i.e., those children who have one or more pencils)

The number of children with 2 or more pencils is 2^{n-2} . Similarly, this number can be considered to represent all the second pencils that the children have, (i.e., those children who have 2 or more pencils), and so on.

Finally the number of children with n (nobody has more) pencils is 2^{n-n} . Thus the total of all the pencils that the children have is $2^{n-1} + 2^{n-2} + \dots + 2^{n-n} = 2^n - 1$

$$\Rightarrow 511 = 2^n - 1 \Rightarrow n = 9$$

i.e., the maximum number of pencils with any child (n) is 9

Alternative Solution:

Let $n = 1$, then the number of students having one or more pencils is $2^{1-1} = 1$. Hence, Total number of pencils = 1

If $n = 2$, then number of students having

$$\text{one or more pencils} = 2^{2-1} = 2$$

$$\text{two or more pencils} = 2^{2-2} = 1.$$

Hence, there is exactly one student with two pencils and there are $(2-1)$ students having one pencil each.

Hence, total number of pencils = $2 + 1 = 3$

Similarly, if $n = 3$, then there is one student with 3 pencils and $(2^{3-2} - 1) = 1$ student with two pencils and $(2^{3-1} - (1+1)) = 2$ students with one pencil each.

That is a total of $3 + 2 + 2 = 7$ pencils.

It can be observed (from the pattern) that total number of pencils = $2^n - 1$

Hence, given total no. of pencils = 511, i.e., $2^9 - 1$, we get $n = 9$. Ans: (9)

19. Let the age of the father be $10a + b \Rightarrow$ Age of the son = b
After 10 years, ages of son and father will be $b + 10$ and $10a + b + 10$ respectively.

$$3(b + 10) = 10a + b + 10 \Rightarrow 2b + 20 = 10a$$

The units digit of $10a$ will be '0'.

\Rightarrow The units digit of $2b + 20$ will also be '0'

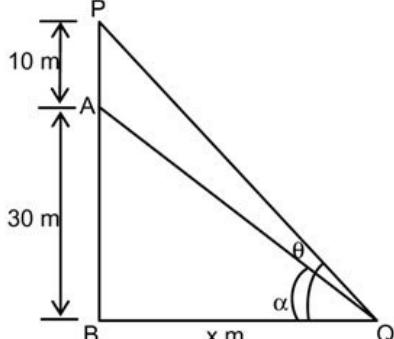
$\Rightarrow b$ is 0 or 5.

As the son's age is more than 2 years $b = 5$

Age of father = $10a + b = 2b + 20 + b = 35$ years

Required sum = $5 + 35 = 40$ years Choice (C)

20.



Let AB be the building and AP be the tower.

Let Q be a point on the ground at a distance of x m.

The angles of elevation of points P and A are θ and α respectively.

\Rightarrow Angle subtended by tower = $\theta - \alpha$

$$\tan\theta = \frac{10+30}{x} = \frac{40}{x}$$

$$\text{and } \tan\alpha = \frac{30}{x}$$

Now $(\theta - \alpha)$ is maximum when $\tan(\theta - \alpha)$ is maximum.

For $\tan(\theta - \alpha)$ to be maximum, $\frac{\tan\theta - \tan\alpha}{1 + \tan\theta \tan\alpha}$ must be maximum.

That is $\frac{\left(\frac{40}{x} - \frac{30}{x}\right)}{\left(1 + \frac{40}{x} \cdot \frac{30}{x}\right)}$ is maximum.

$\Rightarrow \frac{10}{x} \times \frac{x^2}{x^2 + 1200}$ is maximum.

$\Rightarrow \frac{10x}{x^2 + 1200}$ is maximum

$\Rightarrow \frac{x^2 + 1200}{10x}$ is minimum

$\Rightarrow \frac{x}{10} + \frac{1200}{10x}$ is a minimum.

Now, since, product of $\left(\frac{x}{10}\right)$ and $\left(\frac{1200}{10x}\right)$ is constant, the

minimum is achieved when $\frac{x}{10} = \frac{1200}{10x} \Rightarrow x^2 = 1200$ or $x =$

$$\sqrt{1200} = 20\sqrt{3}$$

Alternative Solution:

This question can also be solved using the scientific calculator provided online during the test, using the \tan^{-1} function of the calculator.

Considering option (A): $\theta = \tan^{-1}\left(\frac{40}{30}\right) \approx 53.13^\circ$

$$\alpha = \tan^{-1}\left(\frac{30}{30}\right) = 45^\circ$$

$$\Rightarrow (\theta - \alpha) \approx 8.13^\circ$$

Considering option (B): $\theta = \tan^{-1}\left(\frac{40}{20}\right) \approx 63.43^\circ$

$$\alpha = \tan^{-1}\left(\frac{30}{20}\right) \approx 56.31^\circ$$

$$\Rightarrow (\theta - \alpha) \approx 7.12^\circ$$

Considering option (C): $\theta = \tan^{-1}\left(\frac{40}{20\sqrt{3}}\right) \approx 49.12^\circ$

$$\alpha = \tan^{-1}\left(\frac{30}{20\sqrt{3}}\right) \approx 40.89^\circ$$

$$\Rightarrow (\theta - \alpha) \approx 8.23^\circ$$

Considering option (D): $\theta = \tan^{-1}\left(\frac{40}{15\sqrt{3}}\right) \approx 56.99^\circ$

$$\alpha = \tan^{-1}\left(\frac{30}{15\sqrt{3}}\right) \approx 49.12^\circ$$

$$\Rightarrow (\theta - \alpha) \equiv 7.87^\circ$$

Hence, $(\theta - \alpha)$ is maximum for option (C).

Choice (C)

21. Each person would pair with $(x - 3)$ other persons.

$$\therefore \text{Number of possible pairs} = \frac{x(x-3)}{2}$$

$$\frac{x(x-3)}{2} = \frac{60}{3} = 20$$

$$x(x-3) = (8)(5).$$

Comparing both sides, we get $x = 8$.

Ans : (8)

Note: This question is an application of the concept of the number of diagonals in a polygon of ' n ' sides.

22. It can be observed that $-3 < x$ and $\frac{1}{2} < y$. That is, there is no " \leq " sign for the lower limits of x and y .

Choice (A):

$$\max [(x+y)(x-y)] = \max [x^2 - y^2] < [(-3)^2 - (1/2)^2] < 8 \frac{3}{4}$$

$$\min [(x+y)(x-y)] = \min [x^2 - y^2] = \left(\frac{-1}{2}\right)^2 - (7)^2 = -48 \frac{3}{4}$$

$$\therefore \max [(x+y)(x-y)] - \min [(x+y)(x-y)]$$

$$< 8 \frac{3}{4} - \left(-48 \frac{3}{4}\right), \text{ i.e., } < 57 \frac{1}{2}. \text{ Hence (A) is not true.}$$

\therefore Choice (D) also is eliminated.

$$\text{Choice (B): } \max [(x+y)^2] = [7 + (-1/2)]^2 = \left(\frac{13}{2}\right)^2 = \frac{169}{4},$$

which is true.

\therefore We need not check for choice (C)

Choice (B)

23. Four-digit numbers in base 6 : are 6^3 to $6^4 - 1$ i.e., 216 to 1295.
 Five-digit numbers in base 5 : are 5^4 to $5^5 - 1$ i.e., 625 to 3124.
 Six-digit numbers in base 4 : are 4^5 to $4^6 - 1$ i.e., 1024 to 4095.
 So, the numbers that satisfy all the three conditions are 1024 to 1295 i.e., $1295 - 1024 + 1 = 272$ numbers.

Ans : (272)

24. Given that $\frac{L}{1} = \frac{p+q}{p-q}$, $\frac{M}{1} = \frac{q+r}{q-r}$, $\frac{N}{1} = \frac{r+p}{r-p}$,

Apply componendo and dividendo for the above equation,

$$\frac{p}{q} = \frac{L+1}{L-1}, \frac{q}{r} = \frac{M+1}{M-1}, \frac{r}{p} = \frac{N+1}{N-1}$$

$$\frac{p}{q} \times \frac{q}{r} \times \frac{r}{p} = \frac{(L+1)(M+1)(N+1)}{(L-1)(M-1)(N-1)} = 1$$

$$\Rightarrow LM + MN + NL + 1 = -LM - MN - NL - 1$$

$$\Rightarrow LM + MN + NL = -1$$

Alternative solution:

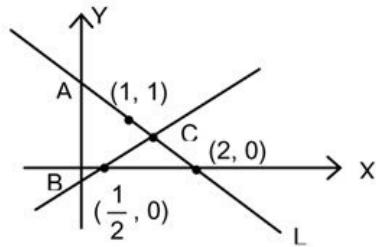
The question can be solved by directly assuming values for p , q and r as say -1 , 0 and 1 (OR 1 , 2 and 3) respectively.
 The values of L , M and N will automatically follow, and $LM + MN + NL$ can easily be verified to be -1 .

Choice (A)

25. Equation of the line L is

$$y - 1 = \frac{0-1}{2-1}(x-1)$$

$$\therefore x + y = 2 \dots \dots \dots (1)$$



equation of line through $(\frac{1}{2}, 0)$ and perpendicular to (1) is

$$y = -\frac{2-1}{0-1}\left(x - \frac{1}{2}\right)$$

$$\text{i.e. } x - y = \frac{1}{2} \quad (2)$$

(2) intersects y axis at B $\left(0, -\frac{1}{2}\right)$ and at C $\left(\frac{5}{4}, \frac{3}{4}\right)$

$$\therefore \text{Area of triangle ABC} = \frac{1}{2} \left[\frac{5}{4} \right] \left[2 + \frac{1}{2} \right] = \frac{25}{16}$$

Choice (A)

26. Speed of A in m/s = $54 \times \frac{5}{18}$ m/s = 15 m/s

$$\therefore \text{Time taken by A to complete the race} = \frac{6000}{15} = 400 \text{ sec}$$

Time taken by B to complete the race
 $= (400 + 20) \text{ sec} = 420 \text{ sec}$

Time taken by D to complete the race
 $= (420 + 70) \text{ sec} = 490 \text{ sec}$

Time taken by C to complete the race
 $= (490 - 40) \text{ sec} = 450 \text{ sec}$

Now, Ratio of the speeds of B and C

$$= \text{Ratio of the times of C and B} = \frac{450}{420} = \frac{15}{14}$$

Therefore, when B completes the race, C in that time
 $\frac{14}{15}$ covers $\frac{14}{15} (6000) \text{ m} = 5600 \text{ m}$

Therefore B beats C by $6000 - 5600 = 400 \text{ m}$.

Choice (C)

27. It can be observed that the two terms appearing within the modulus signs are two consecutive integers. It is very easy to answer this question using enumeration approach.

x	x - 1	x - 2	$ x-1 x-2 \leq 10$
-1	-2	-3	6
0	-1	-2	2
1	0	-1	0
2	1	0	0
3	1	2	2
4	3	2	6

Hence, there are six such values.

Ans : (6)

28. Given that the vessel contains a mixture of 70 kg of A and 30 kg of B.

Let the densities of A and B be $2d$ and d (kg/litre) respectively.

$$\therefore \text{Volumes of X and Y in the vessel are } \frac{70}{2d} \text{ l and } \frac{30}{d} \text{ l}$$

respectively.

\therefore The (initial) density of the mixture

$$= \frac{\text{total weight}}{\text{total volume}} = \frac{100}{\frac{35}{d} + \frac{30}{d}} = \frac{100d}{65}$$

After the mixture is evaporated for n hours,

	X	Y
Weight	$(70 - n)$	$(30 - 2n)$
Volume	$\left(\frac{70-n}{2d}\right)$	$\left(\frac{30-2n}{d}\right)$

∴ The (new) density of the mixture

$$= \frac{100 - 3n}{\frac{35-n}{2} + 30 - 2n} \dots\dots (1)$$

$$\text{But it is given that the new density} = 1.04 \left(\frac{100d}{65} \right) \dots (2)$$

Equating (1) and (2)

$$\frac{100-3n}{65-\frac{5n}{2}} = \frac{8}{5} \Rightarrow 5(100 - 3n) = 8 \left(65 - \frac{5n}{2} \right)$$

$$\Rightarrow n = 4$$

Alternative Solution:

This question can also be solved using the options given.

Let the densities be 2 kg/litre and 1 kg/litre.

Original mass = 70 + 30 = 100 kg

$$\text{Original volume} = \frac{70}{2} + \frac{30}{1} = 65 \text{ litres}$$

Original density = $\frac{100}{65}$ and

$$\text{Final density} = \frac{100}{65} \times 1.04 = 1.6$$

Option (A): After 2.5 hours

$$\text{Mass} = 70 - (2.5)(1) + 30 - (2.5)(2) = 92.5$$

$$\text{Volume} = \frac{67.5}{2} + \frac{25}{1} = 58.75$$

$$\Rightarrow \text{Density} = \frac{92.5}{58.75} \approx 1.57, \text{ i.e., not 1.6.}$$

Hence, option (A) is not the answer.

In this manner each of the other choices can be evaluated for the density and checked if the value is equal to 1.6. Only for choice (D) we get density = 1.6.

Choice (D)

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