T.I.M.E.
Triumphant Institute of Management Education Pvt. Ltd.

(Key and Solutions for AIMCAT1711)

Key

SECTION – I
SUB-SECTION: RC

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

SUB-SECTION: VA

1. 31542	3. 52314	5. 2	7. 2	9. D
2. 42153	4. 1	6. 4	8. C	10. B

SECTION – II
SUB-SECTION: DI

1. B	4. B	7. B	10. 2	13. D
2. D	5. D	8. 210	11. 1	14. C
3. D	6. A	9. 575	12. B	15. A

SUB-SECTION: LR

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

SECTION – III: QA

1. C	7. 7	13. B	19. C	25. B
2. B	8. 0	14. B	20. 36	26. A
3. 5050	9. A	15. 25	21. C	27. 511
4. C	10. 2600	16. 24	22. A	28. D
5. A	11. 45	17. A	23. A	29. 80
6. B	12. C	18. B	24. A	30. 22

Solutions

SECTION – I
SUB-SECTION: RC

Solutions for questions 1 to 5:

Number of words and Explanatory notes for RC:

Number of words : 575

1. Option A: Choice A cannot be inferred from the passage even though Credle's comment has been mentioned in para 3: "To this day, when I feel the blood boiling in me and I just want to let it all out, I cut it by 90 percent because I'm a woman."
Option B: Refer to para 4. Women now make up almost 50 percent of those working in the advertising industry, including a relatively small number, like Ms. Credle, in top executive positions. This makes choice B correct.
Option C: Choice C is out of scope.
Option D: Choice D (Her husband was more successful) cannot be inferred. It has only been mentioned in para 2 that "At industry parties, people assume they should be talking to her husband, who is an architect."

Choice (B)

2. Option A: Choice A is out of scope. A sunrise industry is one that is new or relatively new, is growing fast and is expected to become important in the future.
Option B: Choice B is a misdirection. The fifth para begins with: Advertising is far from the only industry that has struggled with issues of sexist behavior and gender bias through the years. So it would appear that choice B is true. However, the para continues to point out a contradiction. "**But** many said they found it hard to believe how much their particular business still remained a white man's world." Hence choice B is not the answer to the question.
Option C: Choice C has not been specifically indicated in the passage.
Option D: Advertising is far from the only industry that has struggled with issues of sexist behavior and gender

bias through the years. This means that other industries had also struggled with these issues. But in interviews with more than a dozen **women**, mostly **executives, who work in advertising**, many said they found it hard to believe how much **their particular business still remained a white man's world.** Hence choice D is correct and is the answer. Choice (D)

3. Option A: More than half a century after the "Mad Men" era, gender bias, while often unspoken or acknowledged, continues to affect how women are treated at work, whom they interact with and what positions they hold. Hence choice A is correct.
Option B: Choice B is a distortion. A female employee of the J. Walter Thompson agency filed a lawsuit in March accusing the company's chief executive of racist and sexist behavior.
Option C: Though the phrase "Mad Men era" has been mentioned in para 4, we cannot infer the veracity of choice C. The time period "first half of the century" has not been clearly defined. "many neurological problems and hence behaved in a mad and unbecoming manner" is out of scope.
Option D: Choice D has not been hinted at by the author of the passage. Choice (A)

4. Option A: Choice A runs tangent to the discussion and is incorrect. The author does not approve or disapprove of the inclusion of women in social activities.
Option B: Choice B may appear to be true but conforming to the rules of "happy hours" has not been suggested by the author as an important reason.
Option C: Choice C is quite the contrary of what has been discussed in the passage. The author has not indicated that gender discrimination has been abolished and minimized at the workplace and that too, through social events like golf outings and drinking.
Option D: Sexism revealed itself in the prevalence of social events like golf outings and drinking events being used for business purposes, a sentiment echoed by several other women interviewed. Women, she said, feel pressure to learn to play golf or to generally act more like their male counterparts or risk missing out on establishing important relationships. Choice (D)

5. Option A: Many said they repeatedly felt ignored or dismissed by male colleagues and left out socially. They recalled times when they were the only woman in meetings with both co-workers and clients. The passage also says that there are male leaders in the advertising industry even today who do not acknowledge Susan Credle who is in the top executive position in the advertising industry. The passage mentions social events like golf outings and drinking events where sexism prevails. Choice A would be an example of a situation which amount to a display of gender bias in the advertising world.
Choice B: The passage mentions that men don't realize it's demeaning to refer to a top executive of an advertising firm (who has been working in the business for decades) as "young girl". But choice B runs tangent to the discussion of gender bias or discrimination faced by women in the advertising world. It is not a specific example of gender bias faced by women. It talks about women's conscious effort to avoid the "young girl look" and does not discuss how men display gender bias in the advertising world. Hence option B would be the answer.
Option C: Refer to the last few sentences of the fifth para: Some pointed to the ads themselves as examples of how the industry's sexism manifested itself beyond office walls. "If all the advertising is being created through the dominant male lens and you look at what the result is, there's a bias in that and there's only one perspective," said Jean Batthany, the executive creative director at DDB Chicago. So choice C would contribute to a display of gender bias in the advertising world.
Option D: Choice D is definitely an example of gender bias and discrimination. In the fourth para, it has been cited that a female employee of the J. Walter Thompson agency filed a lawsuit in March accusing the company's chief executive of **racist and sexist behavior.** "Yes, there is the rapey talk and the grabby hands, but it's that subtle **(discreet)** stuff that's chronic and can be more damaging," Choice (B)

Solutions for questions 6 to 10:

Number of words and Explanatory notes for RC:

Number of words : 682

6. "A set of straight and gleaming teeth makes for a beautiful smile. But how many people who have undergone a little dental maintenance know that they may have inside their mouths some of the first products of a new industrial revolution?" The author then goes on to introduce the concept and technology of 3D printing to us.
Option A: The condition "unless they have a beautiful smile" in choice A makes it incorrect.
Option B: The passage does not say that 3D printing is complicated as a concept and people do not and cannot understand it. Hence choice B is incorrect.
Option C: The word "only" in choice C makes it a narrow choice. We can rule it out.
Option D: But how many people who have undergone a little dental maintenance know ..... products of a new industrial revolution? Tens of millions of dental crowns, bridges and orthodontic braces have now been produced with the help of additive manufacturing or 3D printing. Hence choice D is the correct answer. Choice (D)

7. Option A: While it has been mentioned in para 1 that 3D printing technology is used to produce dental crowns, bridges and orthodontic braces, and further in para 3 that things are done differently at an industrial unit in Miskin, near Cardiff, we cannot infer that people at Miskin are more prone to dental problems. Choice A is incorrect.
Option B: The plant is equipped with three of the firm's 3D printers; more will be added soon. Each machine produces a batch of more than 200 dental crowns and bridges from digital scans of patients' teeth. Once complete, the parts are shipped to dental laboratories all over Europe where craftsmen add a layer of porcelain. Some researchers are now working on 3D printing the porcelain, too. From this, we can infer that more 3D printers will be required in future. Hence choice B is the answer.
Option C: We cannot say that employees at the British Engineering Company are not efficient in managing 3D printers. The printers run unattended and make each individual tooth to a design that is unique to every patient. The 3D printing process is successfully carried out here. Hence choice C is incorrect.
Option D: "Existing 3D printers becoming defunct or running out of order" is a pessimistic view that has not been mentioned in the passage Choice (B)

8. Option A: The application of 3D printing in the medical field has been discussed in para 4. "Hundreds of thousands of people have been fitted with 3D-printed orthopaedic implants, from hip-replacement joints to titanium jawbones, as well as various prosthetics. An untold number have benefited from more accurate surgery carried out using 3D-printed surgical guides; around 100,000 knee replacements are now performed this way every year." This does not mean that 3D printing carries out surgeries, but that it provides resources used in the carrying out of surgeries. So option A is out of scope.
Option B: We cannot say that 3D printing was already on par with and has now replaced all conventional methods or processes. Choice B is far-fetched.
Option C: While the passage implies that 3D printing is

cheap (And software is faster and **cheaper** to change **than tools used in a traditional factory**, which is designed to churn out identical products), it does not discuss the 3D printing business from the investors' angle. Hence choice C is incorrect.
Option D: It has been mentioned in para 3 that the 3D printers make each individual tooth to a design that is unique to every patient. Para 5 states that the health-care industry has so swiftly adopted additive manufacturing should be no surprise. People come in all shapes and sizes, so the ability of a 3D printer to offer customised production is a boon. In para 4, we are told that a large number of people have benefited from more accurate surgery carried out using 3D-printed surgical guides. Hence choice D is correct. Choice (D)

9. Each machine produces a batch of more than 200 dental crowns and bridges from digital scans of patients' teeth. The machines use a laser to steadily melt successive layers of a cobalt-chrome alloy powder into the required shapes. The process is a bit like watching paint dry – it can take eight to ten hours – but the printers run unattended and make each individual tooth to a design that is unique to every patient.
Option A: "Watching paint dry" is a standard idiom. It means that you find things boring since you wait for the outcome of a process or development that is so slow that the progressive changes are hardly discernable. Since there's nothing in the context that indicates the levels of interest or boredom that the process generates, clearly the author has used the term to indicate the very slow pace at which the process runs – 8 to 10 hours. Choice A reflects the use of the idiom and of the context of the process being unattended, and is the correct answer.
Option B: The passage does not stress on the "craftsmanship" aspect of the 3D printing process. As of now, once complete, the parts are shipped to dental laboratories all over Europe where craftsmen add a layer of porcelain. This is a separate process. So choice B is not true.
Option C: The author discusses the benefits of the 3D printing process. He does not point to the capability of people in the healthcare industry. Note that "catering to different kinds of people" is a confusing phrase in this case. Choice C is not the answer as it does not discuss the benefits from the 3D printing perspective.
Option D: The author does not praise the benefits of customised production over mass production through his comment "People come in all shapes and sizes". The author compares customised production with traditional methods in other parts of the passage. Choice D is not specific to the question.
The purpose behind the author's comment "People come in all shapes and sizes" (para 5) is to point out that 3D printing can facilitate the specific and unique requirement of every individual. (That the health-care industry has so swiftly adopted additive manufacturing should be no surprise. People come in all shapes and sizes, so the ability of a 3D printer to offer customised production is a boon). Choices C and D are incorrect. Choice (A)

10. (a) In para 4 it has been mentioned that more than 60m custom-shaped hearing-aid shells and earmoulds have been made with 3D printers since 2000. Hence (a) is an example of 3D-printed industrial products already in use. (a) is correct and is not the answer.
(b) Titanium jawbones is an example of the 3D-printed orthopaedic implant mentioned in para 4. Hence (b) is correct and is not the answer.
(c) Hip-replacement joints are mentioned as examples of the 3D-printed orthopaedic implants mentioned in para 4. As for knee-replacement, we are not told about the replacement components, but that 3D-printed surgical guides are used for more accurate surgeries. Refer to the last sentence of para 4: An untold number have benefited from more accurate surgery carried out using 3D-printed surgical guides; around 100,000 knee replacements are now performed this way every year. So, (c) is partially incorrect.
(d) Forget the idea of hobbyists printing off small plastic trinkets at home. Plastic trinkets is not an example of an industrial 3D-printed product. Hence (d) is incorrect.
(e) Alcoa, a leading producer of aluminium, recently said it would supply Airbus with 3D-printed titanium fuselage parts, 3D-printed fuel nozzles for jet engines and 3D-printed pylons used to attach engines to wings. This is an indication of what intends to be done, and is not enough to tell us that they're currently in use. So (e) is incorrect.
(f) In the future, large 3D printers will be used not only to print smartphones and portable consumer electronics. There isn't enough to indicate that smartphones are a current application. So, (f) is also incorrect. Choice (B)

Solutions for questions 11 to 15:

Number of words and Explanatory notes for RC:

Number of words : 558

11. Option A: Suppose Thomas Edison had died of an electric shock before thinking up the light bulb. This statement is a supposition. We cannot infer that Edison had risked his life to invent the electric bulb. The second part of choice A (his invention led to a resurgence of interest .....) is out of scope.
Option B: No fewer than 23 people deserve the credit for inventing some version of the incandescent bulb before Edison. But choice B cannot be deduced. It has not been mentioned in the passage that Edison was faster in filing a patent for the invention of the electric bulb.
Option C: No fewer than 23 people deserve the credit for inventing some version of the incandescent bulb before Edison, according to a history of the invention written by Robert Friedel, Paul Israel and Bernard Finn. History would not have been radically different if Thomas Edison died before his invention. This makes choice C correct.
Option D: Would history have been radically different if Thomas Edison died before his invention? Of course not. This implies that Edison could not have markedly altered the course of history. Also, others had invented some version of the incandescent bulb before Edison, so we cannot conclusively say that Edison was the first to invent the most advanced bulb in his time. Hence choice D is incorrect. Choice (C)

12. Refer to the second and third para.
Option A: There is no information in the passage to conclude that inventions have been endless in the past. Hence choice A is not true.
Option B: "one thing leads to another" in choice B cannot be deduced from "parallel instances" as mentioned in Alfred Kroeber's written statement. So choice B is not the answer.
Option C: Different types of inventions (say, inventions in unrelated fields need not necessarily occur at the same time. Hence choice C is incorrect.
Option D: We know of six different inventors of the thermometer, three of the hypodermic needle, four of vaccination, five of the electric telegraph, four of photography, five of the steamboat, six of the electric railroad. The history of inventions, writes the historian Alfred Kroeber, is "one endless chain of parallel instances." No fewer than 23 people deserve the credit for inventing some version of the incandescent bulb before Edison, according to a history of the invention written by Robert Friedel, Paul Israel and Bernard Finn. Hence we can say that for most of the inventions, there can be multiple inventors working independently and simultaneously Choice (D)

13. The history of inventions, writes the historian Alfred Kroeber, is "one endless chain of parallel instances." It is just as true in science as in technology.
Statement 1: Boyle's law in English-speaking countries is the same thing as Mariotte's Law in French-speaking countries. The author talks of parallel developments in technology and says the same is true of science. Which means that certain scientific developments have been independently parallel too. The author talks about two laws, clearly, to provide examples of principles that had developed parallely. So, statement 1is true.
Statement 2: Charles Darwin was prodded into publishing his theory at last by Alfred Russel Wallace, who had precisely the same idea after reading precisely the same book, Malthus's "Essay on Population." From this, we cannot infer that Charles Darwin and Alfred Russel Wallace read the same list of books. Malthus's "Essay on Population" is just one common book read by both. So statement 2 is not correct.
Statement 3: Isaac Newton vented paroxysms of fury at Gottfried Leibniz for claiming, correctly, to have invented the calculus independently. So we know he was angry. There isn't enough, however, to tell us how Liebniz felt, or even whether he knew of Newton. So, we can't arrive at statement 3.
Statement 4: The passage mentions that "Isaac Newton vented paroxysms of fury at Gottfried Leibniz for **claiming, correctly,** to have **invented the calculus independently**." Hence, Gottfried was correct in claiming to have invented calculus independently. Statement 4, therefore, becomes correct. Ans: (14)

14. The history of inventions, writes the historian Alfred Kroeber, is "one endless chain of parallel instances." Numerous examples of inventions have been given to prove this point.
Option A: From the passage, we can infer that the inventors did not work in collaboration but they worked independently. Hence choice A would not be similar in reasoning to the line of thought expressed in paras 2, 3 and 4.
Option B: Choice B also hints at a possibility of reasearchers collaborating with one another. Choice B is not a correct example.
Option C: From the comment of historian Alfred Kroeber, "The history of inventions is one endless chain of parallel instances", we can infer that choice C would be a situation which parallels the examples of inventions by inventors (given in paras 2, 3 and 4) who worked independently to produce the same result. Hence choice C is correct.
Option D: Choice D again does not truly replicate the scenarios of independent work done by researchers to produce the same result (in another part of the world) around the same time, as the second, third and fourth paras of the passage highlight. So choice D is not the answer. Choice (C)

15. Statement (a): From the penultimate para (By 2010, the Internet had roughly as many hyperlinks as the brain has synapses ..... virtually impossible to turn the Internet off), we can infer that sentence (a) suggests that technology is a living thing. The internet wants what every living thing wants: to perpetuate itself. Hence (a) is not the answer.
Statement (b): Sure, technology could not exist without animals (that is, people) to build and maintain it, but then that is true of a coral reef, too. And who knows when this will no longer be true of technology, and it will build and maintain itself? Hence (b) is contrary to what the author suggests and is the answer to the question.
Statement (c): Technology is developing the kind of autonomy that hitherto characterized biological entities.Technology is self-organizing and can, in effect, reproduce and adapt to its environment. It thus qualifies as a living organism, at least in the sense that a coral reef is a living thing. Technology is a very complex organism that often follows its own urges. It "wants what every living system wants: **to perpetuate itself."** Hence (c) also suggests that technology is a living thing and is not the answer.
Statement (d): The first paragraph clearly depicts the thought expressed in statement (d). Technology is not much the product of science. Most technological breakthroughs come from technologists tinkering, not from researchers chasing hypotheses. Heretical as it may sound, "basic science" isn't nearly as productive of new inventions as we tend to think. But statement (d) does not suggest that technology is a living thing.
Statement (e): Technology is a very complex organism that often follows its own urges. A **juggernaut** is a literal or metaphorical force regarded as unstoppable. Hence we can say that (e) also suggests that technology is a living force.
Statement (f): "People are pawns in a process. We ride rather than drive the innovation wave. Technology will find its inventors, rather than vice versa" implies that technology is controlling people. So statement (f) is not correct and is the answer.
So statements (b), (d) and (f) do not answer the question. Choice (B)

Solutions for questions 16 to 20:

Number of words and Explanatory notes for RC:

Number of words : 641

16. According to the passage, Platonism is a point of view that "the physical world naturally follows the rules of mathematics as its "mother tongue," and that this mathematics has its own existence that is out there waiting to be discovered" whereas according to non-Platonism "mathematics is a product of the human imagination that we tailor to describe reality".
Option A: While the first part of the option regarding Platonism can be argued to be true, the second part of this option which states that non-Platonism states that mathematics is independent of the physical world is incorrect. Platonism implies that "mathematics has its own existence" and hence, this option is incorrect.
Option B: The passage mentions that Platonism implies that "the physical world naturally follows the rules of mathematics" and non-Platonism implies that mathematics is tailored to fit reality. Hence, this is the correct answer.
Option C: Since in Platonism, physical world depends on the rules of mathematics, we can probably say that physical world depends on mathematics. However, we cannot infer that it cannot exist without mathematics. Further, the passage does not talk about the interdependence of mathematics and physical reality when describing Platonism and non-Platonism. Hence, this is not the correct answer.
Option D: Abbott argues in his paper that "mathematical Platonism is an inaccurate view of reality". While this is an argument presented by Abbott, we cannot conclude this to be true. Hence, this is not the correct answer.
Therefore, the correct answer is option B. Choice (B)

17. The passage presents the views of Abbott who is a mathematical non-Platonist.
Option A: In the fifth paragraph, Abbot states that "perfect mathematical forms do not exist in the physical universe". Hence, we can conclude this option to be the correct answer.
Option B: In the final paragraph, Abbott mentions that "our successful examples perhaps only apply to a tiny portion of all the possible questions we could ask about the universe". WE can infer from this that the mathematics will not appear as effective if we ask more number of questions about the universe. However, this does not imply that it will be ineffective if our knowledge about the universe increases. Hence, this option is incorrect.

Option C: Abbott, a non-Platonist, believes that maths is "just a mental construct". Hence, this option is incorrect as it states that maths can exist outside human imagination.
Option D: The statement mentioned in this option is a Platonist view and cannot be true according to Abbott.
Hence, the correct answer is option A. Choice (A)

18. The passage talks about Platonism in mathematicians, engineers and physicists. Abbott mentions that "Physicists tend to be "closeted non-Platonists."" They appear Platonist in public but in private they entertain non-Platonist ideas.
Option A: If non-Platonism is more popular than Platonism, there would be no reason for physicists to be closeted non-Platonists. Further, they would want to appear non-Platonists in public, if they want to conform to the popular opinion. Hence, this does not explain the Platonist inclinations of physicists.
Option B: If this statement is true, then physicists would not want to be seen as believing non-Platonism, which is not held in as high a regard as Platonism. Therefore, this will explain the reason why physicists do not want to appear as non-Platonists in public. Hence, this is the correct answer.
Option C: If Platonism explains most of the problems of physics and non-Platonism does not, then physicists would most probably not be "closeted non-Platonists". This does not provide any reason for physicists to be non-Platonists. Hence, this option is incorrect.
Option D: This statement, if true, will only imply that physicists would want to appear as non-Platonists in public and not as Platonists. Hence, this option is also incorrect.
Therefore, the correct answer is option B. Choice (B)

19. The passage mentions that the viewpoints of both Abbott and Wigner are "based on the non-Platonist idea that math is a human invention". However, the passage describes a difference in how they viewed the effectiveness of mathematics. Wigner was a "mathematical optimist" whereas Abbott can be called a mathematical pessimist.
Option A: The passage mentions that both of them were non-Platonists. Hence, this option is incorrect.
Option B: According to the passage, Wigner and Einstein "noticed all the ways that mathematics closely describes reality" and Abbott studied the mathematical models that "fall short". Since this option states the opposite of this, this is not the correct answer.
Option C: The passage does not state that either Abbott or Wigner were the first to study effectiveness of mathematics. Hence, this option is incorrect.
Option D: This statement correctly rephrases the viewpoints of Wigner and Abbott and is the correct answer. Choice (D)

20. The final paragraph of the passage mentions that "Maths only has the illusion of being effective when we focus on the successful examples". This implies that focusing only on successful examples results in maths appearing to be more effective than it actually is.
Option A: Choice-supportive bias does not explain this illusion as this bias is more at an individual level rather than at a collective level. Hence, this is not the correct answer.
Option B: The passage does not mention that the Platonist viewpoint has been "corrected". Abbott only presents an argument in favour of non-Platonism. Hence, this is not relevant in this context.
Option C: Survival bias implies that people concentrate more on successes. This would explain the illusion of the effectiveness of mathematics because even though it is ineffective in a large number of cases, people tend to concentrate on those cases where it is effective. Hence, this would explain the illusion of the effectiveness of mathematics and is the correct answer.
Option D: This effect is irrelevant in this case because there is no event that is described in the passage. The illusion is probably because of the perceptions of people and not because of any event. Hence, this option is not the correct answer.
Therefore, the correct answer is option C. Choice (C)

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

SUB-SECTION: VA

Solutions for questions 1 to 3:

1. 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 person's name Christian Berthelot and the topic of discussion: Medicine Unboxed Creative Prize 2015. Sentence 3 is followed by sentence 1. "winning entry" in sentence 1 links with "winner of the £10,000 Medicine Unboxed Creative Prize 2015" in sentence 3. Sentence 1 is followed by sentence 5. "CESAR series of photographs ..... reframe perceptions ..... startling portraits" link with "theatrical nature of the lighting, compositions and iconography in the CESAR series" in sentence 5. Sentence 5 expands on the features and quality of the CESAR series of photographs and follows sentence 1. Sentence 5 is followed by sentence 4. "masterpieces of the Italian Baroque" and "CESAR series" in sentence 5 links with "like all great works of art that have been crafted" in sentence 4. Sentence 4 compares the photographs to a great work of art. Sentence 2 concludes the paragraph with a viewpoint (art combining with science to replace religion) that emerges after the evaluation in sentences 5 and 4. Sentence 2 is a conclusion that sums up the explanation for the opening sentence 3 where it says that he gets the award for Medicine unboxed. So, 31542. "art" in sentence 2 refers to "masterpieces of the Italian Baroque" and "theatrical nature of the lighting, compositions and iconography" mentioned earlier in sentence 5. "science" in sentence 2 refers to "caesarian section birth ..... through startling portraits of the first seconds of life" mentioned earlier in sentence 1. Ans: (31542)

2. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the paragraph. It introduces the topic of discussion: Cuneiform (made headlines recently .....). It talks about a new discovery of cuneiform handwriting discovered in tablet fragments in Iraq. Sentences 4 and 2 form a mandatory pair. "the discovery of 22 new lines" in sentence 4 links with "discovery of new bits of millennia-old literature" in sentence 2. Sentence 2 is followed by sentence 1. "story of cuneiform itself" introduced in sentence 1 is expanded in sentence 1: Cuneiform, was invented some 6,000 years ago ..... Sentence 1 and sentence 5 form another mandatory pair. "often written on iPhone-sized clay tablets" in sentence 1 is followed by "Deciding to use clay for a writing surface was ingenious" in sentence 5. "other writing surfaces people have used in the past – deteriorate easily" in sentence 5 is linked with " But not clay, which has proven to be the most durable, and perhaps most sustainable writing surface" in sentence 3. Hence 42153. Ans: (42153)

3. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It introduces the topic: The occurrence of stress and strain is a common phenomenon. Sentence 5 is followed by sentence 2. "Most people are driving themselves at a pace which is too fast" in sentence 5 is followed by "The tempo of life is such that he is

constantly running after things" in sentence 2. The consequences of living a life in the fast lane are then elaborated in sentence 3: ..... destroy our mental balance and also be detrimental to our physical well-being. Sentence 1 follows sentence 3. "Our thoughts torture us" in sentence 1 links with "destroy our mental balance" in sentence 3. Sentence 4 (Gradually we become so maladjusted to life .....) concludes the paragraph. So, 52314. Ans: (52314)

Solutions for questions 4 to 7:

4. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the paragraph. It introduces the comic strip "Peanuts" that the author read as a kid. Sentence 2 is followed by sentence 5. "At that time, "Peanuts" was becoming ....." in sentence 5 links with the time reference "more than a decade old when I started reading it as a kid in the mid-1960s" in sentence 2. Sentence 5 and sentence 4 form a mandatory pair. "overwhelming commercial success of the strip often overshadows its artistic triumph" in sentence 4 links with "pop culture, with best-selling books and a newly burgeoning merchandising empire of plastic dolls, sweatshirts, calendars and television specials" in sentence 5. Sentence 4 also introduces the name of the creator of "Peanuts": Charles Schulz. So, 254. "Charles Schulz wrote and drew every panel himself" in sentence 4 links with "clean, minimalist drawings" in sentence 3. And "in countless ways, Schulz blazed the wide trail that almost every cartoonist since has tried to follow" in sentence 3 follows "Charles Schulz wrote and drew every panel himself, making his comic strip an extremely personal record of his thoughts" in sentence 4. Hence 2543. Sentence 1 is the odd sentence out as it needs a precedent (that may tell us that Mr. David Michaelis is the biographer of Charles Schulz) and more substantiation. Ans: (1)

5. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the paragraph. It tells us about the assurance given by the rural development ministry. "had assured the nation" in sentence 3 is linked with "that is encouraging" in sentence 1. Also "crisis" in sentence 3 points to "problem" in sentence 1. Sentence 1 is followed by sentence 5. "this complacency cannot deflect us from the problem itself" in sentence 1 is linked with "The issue is not just of food" in sentence 5. Sentence 4 completes the paragraph. Hence 3154. Sentence 2 is the odd sentence out as "financial turmoil" and "systemic weaknesses in global financial markets" need precedents and more substantiation.
Ans: (2)

6. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It introduces the background: three qualities of work (autonomy, complexity and a connection between effort and reward). Sentence 3 follows sentence 5 as it brings in the factor of money as says that money does not make us happy, (fulfilling) work does. "our work fulfills us" in sentence 3 links with "work ..... satisfying" in sentence 5. Sentence 1 follows sentence 3. It poses a question that relates money and satisfying work and offers a choice of work: architect for $75000 a year OR working in a tollbooth for $100000 a year. Sentence 2 concludes with the answer (One would accept the former work : i.e. being an architect for $75000 a year, which would be more satisfying). "complexity, autonomy, and a relationship between effort and reward in doing creative work" mentioned in the conclusion sentence 2 also mirrors the viewpoint in the introduction sentence 5. So, 5312. Sentence 4 runs tangent to the paragraph as it talks about the importance of money in the relationship between effort and reward. Sentence 4 is the odd sentence out as it needs a precedent and more substantiation. It can be a part of another paragraph.
Ans: (4)

7. 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 topic of discussion: restitution and memory. The debates on the same indicate that World War II never ended. Sentences 3 and 1 form a mandatory pair. The pronoun 'it' in sentence 1 refers to "World War II". "It is still very much with us" in sentence 1 links with "World War II never ended" in sentence 3. Sentence 5 continues on the same line of thought. "revive pre-war memories" in sentence 5 links with "paradoxically re-invoked by the events ....." in sentence 1. Also "expansion of Europe to the east in the aftermath of the collapse of communism and economic globalization" in sentence 1 is linked to "The growing privatization and reprivatization in Eastern Europe" in sentence 5. Sentence 4 summarizes the para and completes the thoughtflow (far-reaching revolution of existing property relations). " blanket of collectivization and nationalization of property after 1945" in sentence 5 links with "existing property relations" in sentence 4. Hence, 3154. The discussion of 'property' in sentences 5 and 4 expands on 'restitution' mentioned in the introduction sentence 3. Sentence 2 deviates from the topic of discussion: restitution and memory. It is another aspect of World War II and can be a part of another article or paragraph. Ans: (2)

Solutions for questions 8 to 10:

8. Option A: In this case, Choice A is same as the original question and has a number of errors in it.
Option B: The sentence construction "both ..... as well as" is incorrect. It should be "both ..... and". The comparison "more rapid" should be used to make it parallel to "more profound". Also, the ununderlined portion has "..... to cope". In this case "..... bureaucracies are **so** cumbersome and **too** entrenched" in the underlined portion is incorrect. The sentence construction "too ..... to" should be followed. The part should read: highly centralized Weberian-style bureaucracies are **too** cumbersome and **too** entrenched .....
Option C: Choice C is logically and grammatically correct. "both more profound and more rapid" is the correct comparison to be used. Also "highly centralized Weberian-style bureaucracies are too cumbersome and too entrenched" has the correct sentence construction "too ..... to".
Option D: Choice D is wrong because it has "as well as" instead of "and" (both ..... and). "so cumbersome and so entrenched" in choice D is incorrect. "So....." should be followed by "that....." which is not available in this case. Hence "too .... to" should be used as in choice C.
Choice (C)

9. Option A: In this case, Choice A is the same as the original question and has a number of errors in it.
Option B: The adverb 'yet' is misplaced. It should read: ..... and yet if that were ..... The words 'primary reason' should be preceded by the definite article 'the'. The word 'influence' should be preceded by the indefinite article 'an'. "would not have.... worked" is incorrect usage. We will have to say " should not have worked". Also the adverb 'similarly' has to be placed after the verb 'worked'. "hundred other countries" has to be preceded by the indefinite article 'a'. The word 'emerge' has to be in the simple past tense. Lastly "on which the sun had not to set" is logically incorrect.
Option C: The words 'primary reason' should be preceded by the definite article 'the'. "hundred other countries" has to be preceded by the indefinite article 'a'. The generalizing or non-restrictive pronoun 'which' in the part "which also emerged from the same empire" needs to be replaced with the restrictive pronoun 'that' (**that** also emerged from the same empire).
Option D: Choice D is grammatically correct and all the errors mentioned above have been corrected in this choice. Choice (D)

10. This question tests a student on the rules of parallelism. Here 'politician', 'man' and 'leader' are simple noun forms and each of these nouns is attached with an idea or description. So if we want to refer to I. K. Gujral as a politician among politicians, as a man among men and as a leader among other leaders, we can write "With the passing away of Mr. I. K. Gujral, India has lost a politician of nobility and distinction, a man of extraordinary abilities and distinctive (exceptional) humaneness, a leader of admirable vision and radical thinking in his outlook on the relationship between India and Pakistan." The grammatical elements are correctly mentioned in choice B which also follows the rules of parallelism.

Other choices have the following errors:

Option A: "a noble and distinguished politician" is not parallel to the remaining two parts: "a man of extraordinary abilities and humane(ness)" and "a leader of admirable vision and radical thinking". Also the noun form of "humane" i.e. "humaneness" needs to be used. The preposition "among" needs to be replaced with "between". "on his outlook" needs to be replaces with "in his outlook". Also "had lost" in choice A is incorrect. There is no need of using the past perfect tense as the context does not imply something following "lost".

Option C: The parts are parallel to one another as explained above but the wrong preposition is used in the segment "radical thinking **on** his outlook". One should say: "radical thinking **in** his outlook".

Option D: "a noble and distinguished politician" is not parallel to the remaining two parts: "a man of extraordinary abilities and humane(ness)" and "a leader of admirable vision and radical thinking". One should say: "a politician of nobility and distinction". Also "had lost" in choice A is incorrect. There is no need of using the past perfect tense as the context does not imply something following "lost".

Choice B is grammatically correct and is the answer.

Note 1: If we want the last part of the sentence to stand on its own without being parallel to the first two parts of the sentence, we can write "..... a leader **with** admirable vision and ....." (i.e. a leader amongst other leaders with related qualities in their outlook.....).

Note 2: There is a difference between 'distinctive' and 'exceptional' (as used in choice B and choice C) but that does not effect things – both, though slightly different, are equally meaningful in the context. The word 'distinctive' means "different from the other person" (It singles people out as unique). The word 'exceptional' lifts someone above the other. (It does not refer to uniqueness but to the fact that someone is considerable better than the other). Choice (B)

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

SECTION – II
SUB-SECTION: DI

Solutions for questions 1 to 4:

Let I and F be the number of Indians and Foreigners who purchased an entry ticket.

For 12th March, 10I + 50F = 700 and I ~ F = 10

If I – F = 10, then 10I = 100 + 10F ⇒ 60F = 600 ⇒ F = 10 and I = 20. This is possible.

If F – I = 10, then 50F = 500 + 50I ⇒ 60I = 200 ⇒ I = 3.33 and F = 13.33. This is not possible.

For 13th March, 10I + 50F = 1050 and I ~ F = 3

If I – F = 3, then F = 17 and I = 20. Hence, this is possible.

If F – I = 3, then I = 15 and F = 18. This is also possible.

For 14th March, 10I + 50F = 900 and I ~ F = 6

If I – F = 6, then F = 14 and I = 20. Hence, this is possible.

If F – I = 6, then I = 10 and F = 16. This is also possible.

For 15th March, 10I + 50F = 1160 and I ~ F = 10

If I – F = 10, then F = 17.67. Hence, this is not possible.

If F – I = 10, then I = 11 and F = 21. This is possible.

For 16th March, 10I + 50F = 660 and I ~ F = 6

If I – F = 6, then F = 10 and I = 16. Hence, this is possible

If F – I = 6, then I = 6 and F = 12. This is also possible.

For 17th March, 10I + 50F = 820 and I ~ F = 2

If I – F = 2, then F = 13.33. Hence, this is not possible.

If F – I = 2, then I = 12 and F = 14. This is possible.

For 13th March, the possible values are F = 17 and I = 20; I = 15 and F = 18

For 14th March, the possible values are F = 14 and I = 20; I = 10 and F = 16

For 16th March, the possible values are F = 10 and I = 16; I = 6 and F = 12

The total number of foreigners who purchased the tickets on the remaining days = 10 + 21 + 14 = 45

On these three days, 89 – 45 = 44 foreigners must have purchased the ticket. On March 13th, 17 Foreigners could not have purchased the tickets (since this is the only odd value possible). Hence, on 13th, 18 Foreigners would have purchased. On the remaining days, 26 Foreigners must have purchased. Both the values are possible in this case.

The following table gives the number of Indians and Foreigners that purchased the entry tickets:

Date	Indians	Foreigners
12/03	20	10
13/03	15	18
14/03	10/20	16/14
15/03	11	21
16/03	16/6	10/12
17/03	12	14

1. Between 14th and 16th, on one day the given condition is satisfied in either of the two cases. On the remaining days, for one day the condition is satisfied. Hence, on two days, the number of Indians who purchased the tickets was greater than the number of Foreigners who purchased the tickets. Choice (B)

2. On March 14th, the number of Foreigners who purchased the entry tickets can be either 16 or 14. Hence, the answer cannot be determined. Choice (D)

3. In either case, the total number of Indians who purchased the tickets = 84
Required difference = 5. Choice (D)

4. On March 16th, a total of 26 people would have purchased and on March 14th, a total of 26 people would have purchased. The maximum number of people who purchased the ticket on the same day in this case would be 33 (on March 13th). Choice (B)

Solutions for questions 5 to 7:

We need to convert the price of all the bags into the same currency. Since the conversion rate for INR is given, it will be easier to convert the prices into INR.

The following table provides the prices of the bags:

Bag	AED (INR)	GBP (INR)	INR	PLN (INR)	USD (INR)
Rucksack	1250.0	1278.0	1150.0	1189.5	1302.0
Knapsack	1540.0	1584.0	1510.0	1500.0	1638.0
Suitcase	2100.0	2106.0	2150.0	2239.5	2303.0
Duffel Bag	1100.0	1071.0	1140.0	1150.5	1057.0
Gym Bag	1000.0	954.0	840.0	880.5	798.0

5. To buy the Rucksack, he must use INR in order to minimize the money that he spends.

Choice (D)

6. He will buy the Rucksack in INR, Knapsack in PLN, Suitcase in AED, Duffel Bag in USD and Gym Bag in USD. The total money (in INR) that he has to spend will be 1150 + 1500 + 2100 + 1057 + 798 = 6605.

Choice (A)

7. The maximum difference is for Suitcase = 2303 – 2100 = 203. Choice (B)

Solutions for questions 8 to 11:

Given that on Day 1, the average was 23 and the total marks scored = 23 × 25 = 575.
On Day 1 and Day 2 combined, the average was 23.91 for 25 + 21 = 46 students.
Total marks scored by the kids who wrote the test on Day 1 and Day 2 = 46 × 23.91 = 1100
Total marks scored by the kids who wrote the test only on Day 2 = 1100 – 575 = 525
Average marks scored by only those kids who wrote the test on Day 2 = 525/21 = 25
Total marks scored by the kids who wrote the test until Day 3 = 25.02 × 63 = 1576
Average marks scored by only those kids who wrote the test on Day 3 = (1576 – 1100)/17 = 28
Total marks scored by the kids who wrote the test until Day 4 = 24.47 × 73 = 1786
Average marks scored by only those kids who wrote the test on Day 4 = (1786 – 1576)/10 = 21
Total marks scored by the kids who wrote the test until Day 5 = 23.49 × 86 = 2020
Average marks scored by only those kids who wrote the test on Day 5 = (2020 – 1786)/13 = 18
Total marks scored by the kids who wrote the test until Day 6 = 23.89 × 97 = 2317
Average marks scored by only those kids who wrote the test on Day 6 = (2317 – 2020)/11 = 27

8. The total marks scored by only those kids who wrote the test on Day 4 = 210. Ans: (210)

9. The highest total marks were scored by the kids who wrote the exam on Day 1. The highest total marks is 575.

Ans: (575)

10. On two days, Day 3 and Day 6, the average was greater than 25. Ans: (2)

11. Only when the average is less than 20, this is possible. Hence, only on one day no kid could have scored more than 20 marks. Ans: (1)

Solutions for questions 12 to 15:

12. If the Final Rating is to be less than 3, the sum of the ratings on individual parameters has to be less than 12. Five customers (Akshay, Balu, Bhavana, Harini, Karan) satisfy the given condition. Choice (B)

13. The condition is satisfied for Anne, Bhavana and Minny, i.e., a total of three customers. Choice (D)

14. Average rating = $\frac{14+10+10+12+9+13+17}{4\times7} = 3.04$

Choice (C)

15. Required average age

$$= \frac{23+21+24+56+51+20+29+54+52+24+15+26+34+52+21}{15} = 33.47$$

Choice (A)

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

SUB-SECTION: LR

Solutions for questions 1 to 4:

Given that B was born in New York. C and D live in London and Paris respectively. From (i), the person born in Los Angeles lives in Cairo. This cannot be B or C or D. This cannot be A because A was not born in Los Angeles. From (ii), this person cannot be F. Hence, E must have born in Los Angeles and lives in Cairo.

F was not born in Paris. From (v), B, C and D were not born in Paris. Hence, A must have been born in Paris and lives in New York. Also, the person who was born in London and living in Los Angeles must be F.

B must be living in San Francisco. Since C could not have been born in Cairo, B must have been born in Cairo and C must have been born in San Francisco.

The following table presents this information:

Person	Born In	Lives In
A	Paris	New York
B	New York	San Francisco
C	San Francisco	London
D	Cairo	Paris
E	Los Angeles	Cairo
F	London	Los Angeles

1. F was born in London. Choice (D)

2. B lives in San Francisco. Choice (B)

3. E was born in the same city that F stays in (Los Angeles). Choice (C)

4. F lives in Los Angeles. Choice (A)

Solutions for questions 5 to 7:

Given that Priya got back a change of ₹3. This is only possible if she paid two ₹5 coins to purchase a ₹7 ticket. The conductor must have given back one ₹1 coin and one ₹2 coin. From (v), Arvind must have purchased a ₹5 ticket using a ₹5 coin.

From (ii), since Supriya got back an amount of ₹1 from the conductor, she must have paid using three ₹5 coins to purchase a ₹14 ticket. And Gautami also must have purchased a ticket of the same denomination. Also from (vi), the conductor had with him 6 + 26 + 50 = ₹82 at the end of the day. At the start of the day, the conductor had ₹23 with him. Hence, the passengers together must have purchased tickets worth ₹59. Since Priya, Arvind, Supriya and Gautami purchased tickets of worth ₹7, ₹5, ₹14 and ₹14 respectively,

Lakshmi and Laxman must have purchased ₹14 and ₹5 tickets in any order.

From (iv), Gautami did not use ₹5 coins to pay for her ticket. Total number of ₹5 coins at the end of the day is 10. Therefore, the passengers must have given eight ₹5 coins to the conductor. Lakshmi and Laxman combined must have given two ₹5 coins to the conductor. Laxman did not use ₹5 coins to pay for his ticket from (iv). Hence, Lakshmi must have used two ₹5 coins to pay for her ticket. Therefore, Lakshmi must have purchased the ₹14 ticket because she could not have purchased the ₹5 ticket and pay two ₹5 coins.

The following table presents this information split by the number of coins that each person used. A positive value indicates the number of coins given to the conductor and a negative value indicates the number of coins the conductor gave back to the passenger.

Passenger	₹1 coins	₹2 coins	₹5 coins	Ticket Value
Arvind	0	0	1	5
Gautami			0	14
Lakshmi			2	14
Laxman			0	5
Priya	-1	-1	2	7
Supriya	-1	0	3	14

Gautami could have paid for her ticket using six ₹2 coins and two ₹1 coins. If she had paid using lesser number of ₹2 coins she would have paid using more than eight coins. If she had paid using more number of ₹2 coins, no one else could have paid using eight coins (from (iii)).

The conductor must have had an increase of nine ₹2 coins. Hence, Lakshmi and Laxman combined must have given four ₹2 coins to the conductor. The maximum number of ₹2 coins that Laxman could give the conductor is two because he purchased a ₹5 ticket. The minimum number of ₹2 coins that Laxman can give is also two because if he gives only one ₹2 coin Lakshmi has to give three ₹2 coins. This is not possible because then Lakshmi would have paid in excess using ₹2 coins.

Therefore, Lakshmi paid using two ₹2 coins and two ₹5 coins and Laxman paid using one ₹1 coin and two ₹2 coins. The following table presents the final information.

Passenger	₹1 coins	₹ 2 coins	₹5 coins	Ticket Value
Arvind	0	0	1	5
Gautami	2	6	0	14
Lakshmi	0	2	2	14
Laxman	1	2	0	5
Priya	-1	-1	2	7
Supriya	-1	0	3	14

5. Lakshmi purchased a ₹14 ticket. Choice (A)

6. Two passenger paid an amount in excess of the value of their ticket. Ans: (2)

7. Gautami paid for her ticket using the maximum number of ₹1 coins. Choice (A)

Solutions for questions 8 to 11:

Since the career of Mr. D'Souza spanned 35 years, starting from 1980 until 2014 (inclusive), in which he worked in seven places for a distinct integral duration, Mr. D'Souza could have worked in the seven cities for 2, 3, 4, 5, 6, 7, and 8 years respectively.

Given that Mr. D'Souza started working in Panaji in 2007. He could not have worked in Panaji from 2007 to 2014 (for eight years) from (ii) because he worked for a lesser duration in Panaji than in Nasik. Hence, Panaji could not have been the last city that he worked in.

Therefore, in the last 8 years of his career, he must have worked in two cities. He could not have worked 4 years each in the two cities (since it would not be distinct). He could not have worked for 5 years and 3 years (since he worked in Ahmedabad for 5 years). Hence, he must have worked in the final two cities for 6 years and 2 years in any order.

From (i) and (iii), Mr. D'Souza worked in Panaji immediately after Bhopal and he worked in Ahmedabad immediately after Nasik. Since Panaji is the penultimate city that the worked in, he must have worked in Ahmedabad and Nasik before Panaji and Bhopal. Also, from (iv), he worked in Hyderabad before Nasik and this was not the first city that the worked in. Since Panaji is the 6th and Bhopal the 5th city that he worked in, Hyderabad can only be 2nd, and Ahmedabad and Nasik must be 3rd and 4th respectively.

The first city can be Chandigarh or Trivandrum. Given that he was working in his first city in 1985. This means that he worked there for at least 6 years (from 1980 to 1985, inclusive). From (v), this city cannot be Chandigarh because he worked in Chandigarh for less than 5 years.

Hence, Mr. D'Souza worked in Trivandrum first and Chandigarh must have been the last city. Also we have seen that he must have worked in Panaji and the last city, Chandigarh for 2 and 6 years. Since, he could not have worked in Chandigarh for 6 years, he would have worked in Panaji for 6 years and in Chandigarh for 2 years.

In Trivandrum he must have worked for 7 or 8 years and in Nasik he must have worked for 7 or 8 years (from (ii)). Therefore, in Hyderabad and Bhopal he must worked for 3 or 4 years in any order.

The following table give the possible durations and the order of the cities where he worked.

City	Duration (Years)
Trivandrum	7/8
Hyderabad	3/4
Ahmedabad	5
Nasik	8/7
Bhopal	4/3
Panaji	6
Chandigarh	2

8. The fourth city that Mr. D'Souza worked in was Nasik.
Choice (C)

9. Mr. D'Souza worked in Chandigarh for 2 years.
Ans: (2)

10. Mr. D'Souza worked in Hyderabad for 3 or 4 years. He would have started working in Hyderabad in 1987 or 1988. Hence, he must have been working in Hyderabad in 1988 and 1989. Hence, the answer is option B.
Choice (B)

11. Looking at the table, the earliest that he could have started working at Nasik is after 15 years i.e., from 1995 and the latest is from 1997. Given that Mr. D'Souza was working in Nasik in 1996. He could have started working in Nasik in 1995 or 1996. In either case, if he has to start working at Bhopal the earliest, he must have finished working in Nasik in 2002. Hence, the earliest that he could start working at Bhopal is 2003.
Choice (C)

Solutions for questions 12 to 15:

Given that each student is facing either East or West. Let the positions of students be from West to East (i.e. 1st student is at extreme left (West) and 8th student is at extreme right (East)).

Since A announced 5 and B announced 2, they must be standing at 3rd and 6th facing the same direction.

Since C and E both announced 6, they must be standing at 2nd and 7th facing different directions.

Since D and G announced 4 and 3, they must be at 4th and 5th facing the same direction.

F and H must be at the extremes facing the same direction.
The following table gives the position of the eight students:

Position	1	2	3	4	5	6	7	8
Student	F/H	C/E	A/B	D/G	G/D	B/A	E/C	H/F

Let the position number represent the student standing at the position.

Since C and E both announced 6, they must be facing each other, i.e., the student at 2 must be facing East and the student at 7 must be facing West. If H is at 1, he must be facing West (since there is no one in front of him). F will be at 8 facing West. The student at 6 cannot be facing West (since 7 and 8 are already facing West). Hence, the student at 6 must be facing East and it must be B. A must be standing at 3 and he must be facing East. The student at 4 must be facing West and it must be G. The student at 5 must be D and h must also be facing West. However, in this case, five students, H, G, D, E/C and F, are facing West. Hence, this case is not possible.

If H is at 8, he must be facing East. F must be at 1 facing East. The person at 3 cannot be facing East (since 1 and 2 are facing East). Hence, B must be at 3 facing West and A must be at 6 facing West. D must be at 4 facing East and G must be at 5 facing East. In this case, only three students, B, A and E/C are facing West.

Hence, there are only two possible cases:

← West							East →	
Student	F	C/E	B	D	G	A	E/C	H
Case 1	East	East	West	East	East	West	West	East

12. A is facing West.
Choice (A)

13. Five students are facing East.
Ans: (5)

14. If C is standing in front of B, C must be 2nd. In this case, A will be standing four places away from C.
Choice (D)

15. We need to look at the directions in which the students are standing. Student at 2nd position will not be standing behind anybody (both the students standing next to him will be facing him). Similarly, the students at 5th and 6th positions will also not be standing behind anybody. Hence, a total of three students will be not be standing behind anybody. Choice (C)

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

SECTION – III: QA

Solutions for questions 1 to 30:

1. It is given that,

$$\frac{MP-SP}{MP}\times 100 = \frac{SP-CP}{CP}\times 100$$

$CP(MP - SP) = MP(SP - CP)$

$2CP \times MP = SP \times MP + SP \times CP$

$$\therefore SP = \frac{2CP\times MP}{CP+MP} = \frac{2}{\frac{1}{CP}+\frac{1}{MP}}$$

$\therefore$ SP is the harmonic mean of CP and MP

Alternative Solution:

Let the CP, SP and MP be 100, 120 and 150. Clearly choices (A) and (B) are not correct checking for the HM of 100 and 150, we see that option (C) is correct.

Choice (C)

2. Let the present ages of A and B be denoted by a and b respectively.

$3a - 4b = 11$ ____ (1)

Their ages before 5 years were $(a - 5)$ and $(b - 5)$ respectively.

$a - 5 = 2(b - 5)$

$\Rightarrow a = 2b - 5$ ____ (2)

Solving Eq. (1) and Eq.(2), we get the ages of A and B as 21 years and 13 years respectively. Thus the sum of their present ages is (21 + 12) i.e., 34 years.

Choice (B)

3. $S = (100 - 99)(100 + 99) + (98 - 97)(98 + 97) + \ldots. + (2 - 1)(2 + 1) = 199 + 195 + 191 + \ldots. + 3$

This is an AP series where the first term is 3, the last term is 199 and the number of terms = 50

$$S = \frac{50}{2}[199 + 3] = 50(101) = 5050$$

Ans: (5050)

4. Let the breadth of the rectangle be denoted by x.

Therefore the length of the rectangle = $3x$.

Perimeter of the rectangle = $2(x + 3x) = 24$

$\Rightarrow x = 3$

$\therefore$ The area of the rectangle = $(x)(3x) = 3x^2 = 27$ sq. cm

Choice (C)

5. Let the total volume of the mixture be V to 18% $(v - 8)$ = 15% v

$\Rightarrow v = 48$

Let the volume of mixture to be replaced by x lts

$(48 - x)\ 18\% = 12\% .48$

$(48 - x)\ 3 = 96$

$3x = 48$

$\Rightarrow x = 16$ Choice (A)

6. $$\left(\sqrt[3]{\frac{16}{81}}\right)^{2x-5} = \left(\frac{27}{8}\right)^{x-11}$$

$$\left[\left(\frac{2}{3}\right)^{\frac{4}{3}}\right]^{2x-5} = \left[\left(\frac{3}{2}\right)^{3}\right]^{x-11}$$

$$\left[\frac{2}{3}\right]^{\frac{4}{3}(2x-5)} = \left[\frac{2}{3}\right]^{3(11-x)}$$

Comparing the powers, we get,

$$\frac{4}{3}(2x - 5) = 3(11 - x)$$

$\Rightarrow 8x - 20 = 99 - 9x$

$\Rightarrow x = 7$ Choice (B)

7. By Wilson's theorem,

$(p - 1)! + 1$ is divisible by p

Let $(p - 1)! + 1 = pk$

$\Rightarrow (p - 1)(p - 2)(p - 3)(p - 4)! + 1 = pk$

$\Rightarrow (p^3 - 6p^2 + 11p - 6)(p - 4)! + 1 = pk$

$\Rightarrow p(p^2 - 6p + 11)(p - 4)! - (6(p - 4)! - 1) = pk$

Hence, $(6(p - 4)! - 1)$ must be a multiple of p.

Let the remainder when $(p - 4)!$ is divided by p be r.

$\Rightarrow 6r - 1$ must be divisible by p.

Using the above result, for $p = 41$, we conclude that $6(r) - 1$ must be divisible by 41.

Thus we get, $6r - 1 = 41$

$\Rightarrow r = 7$

$\therefore$ 37! (i.e., (41 – 4)!)when divided by 41 leaves a remainder of 7.

Alternative Solution:

We know from Wilson's theorem that $R\left[\frac{40!}{41}\right] = 40.$.

Let $R\left[\frac{39!}{40}\right] = R_{39}$.

$\therefore R\left[\frac{(R_{39})(40)}{41}\right] = 40.$ Since $R\left[\frac{40}{41}\right] = 1$, R_{39} must be 1.

Similarly, $R\left[\frac{(R_{38})(39)}{41}\right] = 1$, i.e., –40.

Since $R\left[\frac{39}{41}\right] = -2$, R_{38} must be 20.

Similarly $R\left[\frac{(R_{37})(38)}{41}\right] = 20$, i.e., –21. Since $R\left[\frac{38}{41}\right] = -3$, R_{37} must be 7.

Hence $R\left[\frac{37!}{41}\right] = 7.$ Ans: (7)

8. $a^4 - b^4 = 9876$

$(a^2 + b^2)(a - b)(a + b) = 9876$

As 9876 is an even number, either both a and b are odd or both are even.

If both a and b are odd, then each of $(a^2 + b^2)$, $(a - b)$ and $(a + b)$ are even and so their product must be divisible by 8.

Similarly, if both a and b are even, then each of $(a - b)$, $(a + b)$ and $(a^2 + b^2)$ must be divisible by 2 and therefore their product must be divisible by 8.

As 9876 is not divisible by 8, there is no solution for the given equation. Ans: (0)

9. As 743a6 is divisible by 44, it must be divisible by 11 as well as by 4.

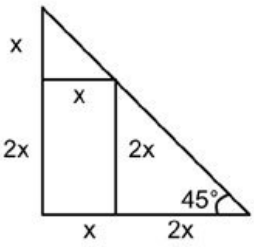
Now for 743*a*6 to be divisible by 11,
$(7 + 3 + 6) - (4 + a)$ must be divisible by 11.
$\Rightarrow 12 - a$ must be divisible by 11
$\therefore a$ must be equal to 1
We can check that 74316 is also divisible by 4.

Choice (A)

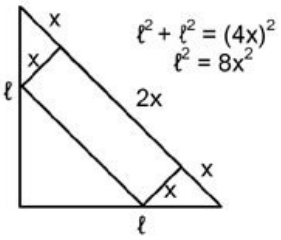
10. Let the number of laddoos with the four friends be denoted by a, b, c and d respectively.
We know that, $a + b + c + d = 50$ ____ (1) where a, b, c and d are all odd numbers greater than or equal to 1.
Now, $a + 1$, $b + 1$, $c + 1$ and $d + 1$ will all be even numbers greater than or equal to 2.
Let us denote them by $2k_1$, $2k_2$, $2k_3$ and $2k_4$, where k_1, k_2, k_3 and $k_4 \geq 1$.
Adding 4 to both sides of equation (1), we get
$a + 1, b + 1, c + 1 + d + 1 = 54$
$\Rightarrow 2k_1, + 2k_2, + 2k_3 + 2k_4 = 2\ (27)$
$\Rightarrow k_1 + k_2 + k_3 + k_4 = 27$ where k_1, k_2, k_3 and $k_4 \geq 1$
Number of solutions to the above equation is given by
${}^{27-1}C_{4-1} = {}^{26}C_3 = 2600$ Ans: (2600)

11. The rectangle when inscribed inside the triangle would be of one of the following forms.

Case I



Case II



$\ell^2 + \ell^2 = (4x)^2$
$\ell^2 = 8x^2$

$$\frac{\text{Area of the rectangle}}{\text{Area of the traingle}} = \frac{x(2x)}{\frac{1}{2}(3x)(3x)} = \frac{4}{9}$$

$$\frac{\text{Area of the rectangle}}{\text{Area of the traingle}} = \frac{x(2x)}{\frac{1}{2}(\ell)(\ell)} = \frac{2x^2}{4x^2} = \frac{1}{2}$$

From Case I, area of the rectangle $= \frac{4}{9}(90) = 40$

From Case II, area of the rectangle $= \frac{1}{2}(90) = 45$

Ans: (45)

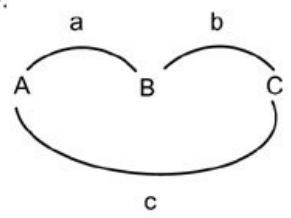
12. Let the length of the track be ℓ.
In the time B covers $(\ell - 20)$, C covers $(\ell - 40)$
Let the speed of C be 4v.
Therefore, speed of B is 25% more than C, i.e., 5v.

Hence, $\frac{\ell - 20}{\ell - 40} = \frac{5}{4}$

$\Rightarrow 4(\ell - 20) = 5(\ell - 40)$
$\therefore \ell = 120.$ Choice (C)

13. Let PA = x
$\therefore$ CD = $2x$
As, (PA) (PB) = (PC) (PD)
$x(x + 14) = 12(12 + 2x)$
$\Rightarrow x^2 - 10x - 144 = 0$
$\Rightarrow (x - 18)(x + 8) = 0$
$\because x \neq -8$, $x = 18$.
$\therefore$ PB = 18 + 14 and PD = 12 + 36
$\therefore$ PB + PD = 32 + 48 = 80 Choice (B)

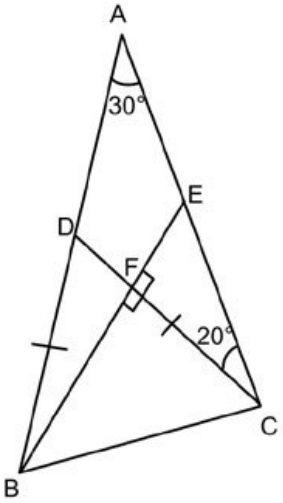
14. Let the number of ways in which one can go from A to B, B to C and A to C directly be denoted by a, b and c respectively.



It is given that, $a = c = 8$ and
$\therefore ab + c = 32$
$\Rightarrow 8b + 8 = 32$
$\Rightarrow b = 3$
Therefore one can go from B to C in 3 ways.

Choice (B)

15.



In the given figure, it is known that $\angle EFC = 90$.
$\therefore \angle AEF = 90 + 20 = 110°$
[since the exterior angle is equal to sum of opposite interior angles]
$\therefore \angle ABE = 180 - 30 - 110 = 40°$
Again, $\angle BDC = 30 + 20 = 50°$ (exterior angle of ΔADC)
As DB = DC, $\angle DBC = \angle DCB = 65°$
$\therefore \angle EBC = \angle DBC - \angle ABE = 65° - 40° = 25°$

Ans: (25)

16. The volume of the frustum of a cone of height h, smaller and larger radii being r and R respectively is given by

$$\frac{1}{3}\pi h\left(R^2 + r^2 + Rr\right)$$

Volume of water that the bucket can hold when it is filled to its brim

$$= \frac{1}{3} \times \frac{22}{7} \times 1\left[\left(\frac{1}{2}\right)^2 + \left(\frac{1}{4}\right)^2 + \frac{1}{2} \times \frac{1}{4}\right]$$

$$= \frac{22}{3 \times 7}\left[\frac{1}{4} + \frac{1}{16} + \frac{1}{8}\right]$$

$$= \frac{22}{3 \times 7}\left[\frac{4 + 1 + 2}{16}\right]$$

$$= \frac{22}{3 \times 7}\frac{[7]}{16}$$

$$= \frac{11}{24} \text{ cu. ft.}$$

Let the number of buckets of water that Bhola needs to fill the tank be n.

$$n\left(\frac{11}{24}\right) = 11$$

$\Rightarrow n = 24$

Alternative Solution:
To find the volume of the bucket imagine a large cone with radius of base as $\frac{1}{2}$ ft and height as 2ft. Now, we need to remove a smaller cone (from the top) with radius of base as $\frac{1}{4}$ ft (i.e., half of the original) and height as 1 feet, to arrive at the frustrum. Now, the volume of the smaller cone will simply be $\left(\frac{1}{2}\right)^3$, *i.e.*, $\frac{1}{8}$ th of the larger cone. That is, volume of frustrum = $1-\frac{1}{8}=\frac{7^{th}}{8}$ of original cone = $\frac{7}{8}\times\left[\frac{1}{3}\times\frac{22}{7}\times\left(\frac{1}{2}\right)^2(2)\right]=\frac{11}{24}$ cu. ft

And number of buckets required
$= \frac{\text{Volume of tank}}{\text{Volume of bucket}} = \frac{11}{\left(\frac{11}{24}\right)} = 24.$

Ans: (24)

17. Let the principal and the rate of interest per annum be denoted by p and r respectively.
It is given that $A_7 = 2A_2$

$$P\left(1+\frac{r}{100}\right)^7 = 2P\left(1+\frac{r}{100}\right)^2$$

$$\Rightarrow\left(1+\frac{r}{100}\right)^5 = 2$$

We need to find $\frac{A_{64}}{A_{49}} = \frac{p\left(1+\frac{r}{100}\right)^{64}}{p\left(1+\frac{r}{100}\right)^{49}} = \left(1+\frac{r}{100}\right)^{15}$

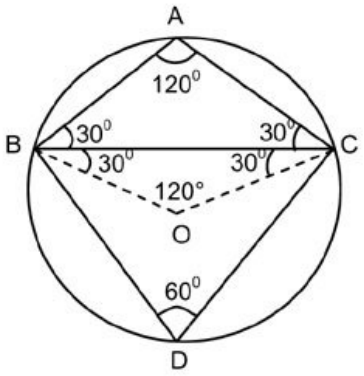
$$= \left(1+\frac{r}{100}\right)^{5\times3} = 2^3 = 8$$

Alternative Solution:
The amount at end of 2nd year doubled by the end of the 7th year. Hence, the amount doubles after every five years.
Now, from 49th to 64th year, involves $3 \times 5 = 15$ years.
Hence, the amount will double itself three times over, i.e., $2 \times 2 \times 2 = 8$ times. Choice (A)

18. As, the quadratic equation has exactly one root between – 1 and 2, the value of the quadratic expression $x^2 - 3x + p$ will have opposite signs at $x = -1$ and $x = 2$
Let $f(x) = x^2 - 3x + p$
$f(-1) = 1 + 3 + p$ and $f(2) = 4 - 6 + p$
$f(-1)\, f(2) < 0$
$(4 + p)(p - 2) < 0$
The critical points are $p = -4$ and $p = 2$
The range of p satisfying the above inequality is
$-4 < p < 2$ Choice (B)

19. Let the number of students who failed be a.
Therefore, the number of students who passed = na.
Total number of students = $a + na = 315$
$a(1 + n) = 315 = 3^2 \times 5 \times 7$
{(1 + (A perfect cube)} can be 2 or 9 or 28 or 65 or 126 or 217 and so on.
Of these, the only possibility is 9.
$\therefore a(1 + 2^3) = 315$
$\Rightarrow a = 35$ and $n = 8$
$\therefore$ Number of students who passed = $na = 8(35) = 280$.
Choice (C)

20.



Let the radius of the circle be denoted by r
We take a point D on the major arc
$\angle BDC = 60^0$ [ABCD is a cyclic quadrilateral]
$\therefore \angle BOC = 120^0$ [Angle subtended at the centre]
Now, OC = OB = Radius of the circle
$\therefore \angle OCB = \angle OBC = 30^0$
$\therefore \frac{BC}{2} = r\cos 30^0$
$\frac{6\sqrt{3}}{2} = r\frac{\sqrt{3}}{2}$
$\Rightarrow r = 6$
$\therefore$ Area of the circle = $\pi(6)^2 = 36\pi$ sq.units
$\Rightarrow k = 36$ Ans: (36)

21. $a + b + c < \frac{ab + bc + ac}{abc}$
$\Rightarrow a + b + c - ab - bc - ac < 0$
$\Rightarrow abc - 1 + a + b + c - ab - bc - ac < 0$
($\because abc = 1$)
$(a - 1)(b - 1)(c - 1) < 0$
$\Rightarrow$ Either all of the factors are negative or exactly one of them is negative.
Now if all of them are negative, then $a < 1$, $b < 1$ and $c < 1$.
$\therefore abc \neq 1$.
Thus exactly one of the factors is negative, which implies exactly one of a, b, c is less than 1 and exactly two of them are greater than 1.

Alternative Solution:
This question can also be solved using the answer choices given.

Choice (A): Let a, b, c be $4, \frac{1}{2}, \frac{1}{2}$ respectively. The given inequality does not hold.

Choice (B): using the same values as in option (A), it can be seen that the given inequality does not hold.

Choice (C): Let a, b, c be 2, 2, $\frac{1}{4}$ respectively. The given inequality holds true.

Choice (D): This is same as choice (A). Since not all of a, b, c can simultaneously be less than 1, at least two of a, b, c means exactly two. Hence, choice (C).
Choice (C)

22. It is given that,
$\log_2 x + \log_x 16 = 4$
$\Rightarrow \log_2 x + \log_x 21 = 4$
$\Rightarrow \log_2 x + \frac{4}{\log_2 x} = 4$ [since $\log_2 x = \frac{1}{\log_x 2}$]
Let $\log_2 x = t$

$t + \frac{4}{t} = 4$

$\Rightarrow t^2 - 4t + 4 = 0$

$\Rightarrow (t-2)^2 = 0$

$\therefore \log_2{}^x = 2 \Rightarrow x = 2^2 = 4$

Alternative Solution:
We can plug powers of 2 (given choices) for x in the L.H.S and check for the result. Choice (A)

23. As profit is proportional to capital and time period, the period of investments of A and B = $\frac{1}{2} : \frac{2}{3} = 3 : 4$.

Choice (A)

24. $a = \sqrt{5} - 2$

$$\frac{1}{a} = \frac{1}{\sqrt{5}-2} = \frac{\sqrt{5}+2}{(\sqrt{5}-2)(\sqrt{5}+2)} = \sqrt{5}+2$$

$$\therefore a + \frac{1}{a} = 2\sqrt{5}$$

$$a^3 + \frac{1}{a^3} = \left(a+\frac{1}{a}\right)^3 - 3\left(a+\frac{1}{a}\right) = \left(2\sqrt{5}\right)^3 - 3\left(2\sqrt{5}\right)$$

$$= 40\sqrt{5} - 6\sqrt{5}$$

$$= 34\sqrt{5}$$

Alternative Solution:
This question can also be answered using the online calculator, by evaluating the given expression and each of the answer choices. Choice (A)

25. The total number of elements in set B = ${}^6C_2 = 15$
Now, each element in A will be considered once with every other elements in A.
$\therefore$ Sum of these 15 elements
= 5 (7 + 17 + 19 + 23 + 31 + 47)
Average of these elements = $\frac{5(144)}{15} = 48$

Choice (B)

26. Let the two digit number be denoted by xy
Value of the two digit number = $10x + y$
Value of the two digit number, when the order of the digits is reversed = $10y + x$
It is given that,
$10y + x = 1.2(10x + y)$
$10y - 1.2y = 12x - x$
$8.8y = 11x$

$$\frac{x}{y} = \frac{8.8}{11} = \frac{4}{5}$$

Thus the two digit number is 45 and the difference between the two digit is 1. Choice (A)

27. Let the total number of elements in set P be n.
Number of subsets containing exactly four elements
$= {}^nC_4 = 126$

$$\frac{n(n-1)(n-2)(n-3)}{4\times3\times2\times1} = 126$$

$\therefore n(n-1)(n-2)(n-3) = 9 \times 8 \times 7 \times 6.$
$\Rightarrow n = 9$
Number of proper subsets of set P = $2^n - 1 = 2^9 - 1$
= 511 Ans: (511)

28. The problem basically involves denoting $3 \times 13 \times 23 \times 33$ as a product of two integers.
Now, number of factors of $3^2 \times 11 \times 13^1 \times 23^1$ is (2 + 1) (1 + 1) (1 + 1) (1 + 1) i.e., 24
it can be expressed as a product of two natural numbers in $\frac{24}{2} = 12$ ways
Now, considering the negative values, we will get another 12 solutions.
For eg.
(1) $\times (3^2 \times 11 \times 13 \times 23)$ can also be expressed as $(-1) \times (-3^2 \times 11 \times 13 \times 23)$
Hence, a total of 12 + 12 = 24 such sets are possible.
Choice (D)

29. Coordinates of $M_1 = \left(\frac{0+16}{2}, \frac{0+64}{2}\right) = (8, 32)$

Coordinates of $M_2 = \left(\frac{0+8}{2}, \frac{0+32}{2}\right) = (4, 16)$

Coordinates of $M_3 = \left(\frac{0+4}{2}, \frac{0+16}{2}\right) = (2, 8)$

Proceeding similarly coordinates of $M_{10} = \left(\frac{1}{64}, \frac{1}{16}\right)$

We can conclude that the coordinates of M_i will be $\left(\frac{16}{2^i}, \frac{64}{2^i}\right)$, i.e., $M_{10} = \left(\frac{1}{2^6}, \frac{1}{2^4}\right)$

Therefore the sum of the reciprocals of the coordinates of M_{10} is 64 +16 = 80 Ans: (80)

30. Let the number of days taken by A alone and B alone be a and b respectively. Since each of A and B worked on exactly half the work and finished it in 25 days

$\frac{a}{2} + \frac{b}{2} = 25 \Rightarrow a + b = 50$ ____ (1)

Also, together they take 12 days.

$\Rightarrow \frac{ab}{a+b} = 12$ _____ (2)

Solving (1) and (2), $a = 30$, $b = 20$ (since A is slower)

Now, if A completes $\frac{1}{5}^{th}$ of the work, and B does the remaining $\frac{4}{5}^{th}$, we get $\frac{1}{5} \times 30 + \frac{4}{5} \times 20 = 6 + 16$

= 22 days. Ans: (22)

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