

(Key and Solutions for AIMCAT1702)

Key

SECTION – I
SUB-SECTION: RC

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

SUB-SECTION: VA

1. 12211	5. 00010	9. 2	13. 1532
2. 12112	6. 00001	10. 3	14. 2
3. 21122	7. 00100	11. 3521	15. 1
4. 21221	8. 2	12. 4152	16. 2

SECTION – II
SUB-SECTION: DI

1. A	4. 2	7. B	10. 9
2. D	5. D	8. C	11. 19
3. C	6. 28	9. 5	12. D

SUB-SECTION: LR

1. C	4. C	7. 26	10. 3
2. B	5. 15	8. 38	11. A
3. D	6. 30	9. 320000	12. 360

SECTION – III: QA

1. B	5. D	9. B	13. C	17. -3	21. A	25. 11
2. 33	6. 44	10. C	14. 80	18. 1	22. -27	26. D
3. 6	7. A	11. A	15. 6	19. 144	23. A	
4. B	8. A	12. 99	16. D	20. 1	24. D	

Solutions

SECTION – I
SUB-SECTION: RC

Solutions for questions 1 to 6:

Number of words and Explanatory notes for RC:

Number of words: 718

1. The passage mentions various differences between the crime fiction written by men and those written by women.

Option A: According to the passage, the crime fiction written by women are "light on gunplay, heavy on emotional violence". Therefore, this is one of the differences, according to the passage.

Option B: The passage does not mention that crime fiction written by women feature female protagonists and those written by males feature male protagonists. Hence, this difference is not mentioned in the passage and is the correct answer.

Option C: The last paragraph of the passage mentions that "Women's murder tales have always been at least a little more psychologically acute than the guys". Hence, this is also mentioned in the passage.

Option D: The first paragraph of the passage mentions that "On the streets his people walked, motives were more basic – money, sex – and means were more direct." We can infer from this that in crime fiction written by men, the means of murder were usually more direct. Hence, this is also not the correct answer.

Therefore, the correct answer is option B.

Choice (B)

2. The first paragraph talks about the novel *Gone Girl* and how it is different from the crime fiction written by men.

Option A: The last line of the first paragraph states that "When today's crime writers are in doubt, they have a woman come through the door with a passive-aggressive zinger on her lips." In the next paragraph, the author states that this is a welcome development for the readers "who choose to entertain ourselves, from time to time, with made-up stories of murder, mayhem, and deceit". We can

infer from this that the welcome development signifies the change in the nature of crime fiction. Hence, this is the correct answer.

Option B: While the first paragraph talks about the novel *Gone Girl*, the welcome development does not refer to this novel. It refers to women walking through doors with a "zinger on their lips" which signifies the change in the nature of crime fiction. Hence, this is not the answer.

Option C: While the welcome development might refer to the women walking in through doors, the author used this phrase to highlight the change in crime fiction. Hence, this is not the correct answer.

Option D: The welcome development does not refer to men with guns. Hence, this is also not the correct answer.

Therefore, the correct answer is option A.

Choice (A)

and female authors when talking about this emphasis. Hence, this is not the correct answer.

Option B: The author states that after the golden age, female authors "were burrowing into the enigmas of identity and the killing stresses of everyday life". Therefore, this does not pertain to the golden age and is not the correct answer.

Option C: As explained in the above option, the author does not differentiate between male authors and female authors when talking about this emphasis. Hence, this is not the correct answer.

Option D: The author states that "the motivations of the culprits in Christie and Dorothy L. Sayers were usually more plausible". Hence, we can say that the plots of these murder tales were more credible.

Therefore, the correct answer is option D.

Choice (D)

3. The passage mentions that men with guns will be prevalent for a long time. He mentions the examples of Elmore Leonard and George Pelecanos.

Option A: We can infer from the passage that Elmore Leonard and George Pelecanos are both crime fiction writers. The passage mentions that "the lowlives and criminal idiots who peopled his stories haven't altogether vanished; George Pelecanos keeps an eye on them for us". We can infer from this that the lowlives and criminal idiots feature in the works of both the authors. But we cannot infer that they feature the same protagonist. Hence, this option is incorrect.

Option B: The author mentions that Ian Rankin, Peter Robinson, and Michael Connelly use aging police detectives. Hence, this option need not be correct.

Option C: The author mentions that Elmore Leonard "has now left the building" and George Pelecanos keeps an eye on the criminal lowlives for us. We can infer from this that Elmore Leonard is no longer writing crime fiction and George Pelecanos uses the same type of characters that Elmore Leonard uses. Hence, this is the correct answer.

Option D: The author states that "George Pelecanos keeps an eye on them for us" to imply that Pelecanos writes novels featuring similar sort of characters that Elmore Leonard used. Hence, this is not the correct answer.

Therefore, the correct answer is option C.

Choice (C)

4. The author talks about the disappearance of private eyes from crime fiction in the second and third paragraphs of the passage.

Option A: The passage states that "Cops and lawyers and the odd freelance avenger (Lee Child's Jack Reacher) are about all that's left". But we cannot infer from the passage that the readers prefer cops and lawyers to private eyes. Hence, this is not the correct answer.

Option B: The relocation of mythic figures "to places farther and farther away from the real-world settings of the old West and the modern city" is one of the consequences of individualism becoming a "less sustainable concept". Another consequence of the same is the disappearance of private eyes. But the relocation of heroes is not a reason for the disappearance of private eyes. Hence, this option is incorrect.

Option C: The passage mentions that "the private eye once embodied male fantasies of rugged individualism". However, individualism "became a less sustainable concept" because of which the private eyes disappeared. Therefore, this is the correct answer.

Option D: The passage does not talk about readers' interest in stories of private eyes. Hence, this is not the correct answer.

Therefore, the correct answer is option C.

Choice (C)

5. The author mentions the golden age of detective stories in the last paragraph of the passage.

Option A: According to the passage, in the golden age of detective stories, "the emphasis was on elaborate puzzles". The author does not differentiate between male authors

Solutions for questions 7 to 12:

Number of words and Explanatory notes for RC:

Number of words: 736

7. Refer to para 4.

Option A: Choice A has not been mentioned in the passage. Option B: Para 4 begins by saying "Long-terminism can be an excuse for failing to grasp the nettle". It gives an example of Nokia's loss. The United States thinks short-term (and allows "creative destruction" to work its magic) when it shifts its capital to new opportunities. So choice B is logically incorrect. It has also not been cited in the passage as a reason for the question.

Option C: The United States has been better than other countries at producing world-beating startups because it is better at shifting capital quickly to new opportunities. This makes option C correct.

Option D: While choice D has been explained in the fifth and sixth paras, it is not specific to the question. It could be a factor for why long-term investors should be rewarded. There are also limitations mentioned in para 6. Their timing is often poor. A doubling of repurchases leads to an 8% fall in spending on R & D.

Choice (C)

8. Refer to para 1.

Option A: Choice A is incorrect. Long terminism has become fashionable. Short-term traders are nothing but trouble. So choice A is a contradiction.

Option B: Germany's relatively strong performance over the past decade seems to be an affirmation of its stolid corporate virtues. Hence choice B is correct.

Option C: Choice C, in a way, criticizes short-terminism and favours long-terminism. But it is insufficient in answering the question. The latter half of choice C is true of Japan and not of Germany.

Option D: Choice D may be true but it is not according to the passage. It doesn't tackle the short-terminism/ long terminism debate in the passage.

Choice (B)

9. Option A: Short-term demands such as quarterly reporting schedules can force problems out in the open. Choice A is correct but it is incomplete.

Option B: It has been mentioned in the passage that Long-termism is no guarantee of success and Long-termism can be an excuse for failing to grasp the nettle. But "helps prove" as given in choice B is not the objective of the quarterly reporting schedules in companies. Hence choice B is extreme in tone and not related to the question.

Option C: Choice C is not true. A company's reputation is not affected beyond repair. A company reviews its performance through quarterly reporting schedules.

Option D: Short-term demands such as quarterly reporting schedules can force problems out in the open, the quicker to get them fixed. We might still be in the dark about Tesco's accounting fiasco if the British grocer did not have to update investors on its performance every few months. More important, short-termism can allow "creative destruction" to work its magic. Hence choice D is correct.

Choice (D)

10. In 1994 Jim Collins and Jerry Porras, two management pundits, published a hymn to long-termism in "Built to Last". The book describes 18 companies whose shares had consistently outperformed stockmarket indices over decades, in large part because they invested heavily in such things as research and training, and set goals that were also measured in decades, not quarters.

Option A: If choice A is true, then it will strengthen the argument that long-terminism is good. Hence choice A is not the answer.

Option B: Choice B will also support the view that long terminism is good. It does not weaken the view of Jim Collins and Jerry Porras.

Option C: If choice C is true, then it will weaken the view of Jim Collins and Jerry Porras. Towards the end of the passage we are told: Long-termism works well in stable industries that reward incremental innovation. But it is a recipe for failure in such businesses as social media, where firms are constantly forced to abandon their plans and "pivot" to a new strategy, in markets that can change in the blink of an eye. Hence choice C is the answer.

Option D: Choice D does not weaken the argument of Jim Collins and Jerry Porras.

Choice (C)

11. Option A: Perhaps the strongest argument for rewarding long-term investors is that they think more about sustained growth, whereas short-term ones will sacrifice this for a quick buck. This is true if companies do not trade in their own shares, says Jesse Fried of Harvard Law School. However, he argues that this argument breaks down when firms become enthusiastic repurchasers of their own shares. So choice A is not the answer.

Option B: What is more important is that the cash companies spend on repurchases of their own shares could often have been used on expanding into new markets, or on research and development, to generate long-term growth. One study found that a doubling of repurchases leads to an 8% fall in spending on R&D. Hence choice B is negated

Option C: Choice B has not been discussed in paras 5 and 6.

Option D: Choice D is correct. Companies repurchase their shares when they think they are cheap, as a way of benefiting their long-term holders at the expense of those who sell. As it happens, their timing is often poor.

Choice (D)

12. Statement 1 – The author would disagree with statement 1. He gives examples of firms like IBM, Motorola, Procter and Gamble, Nokia and of Japan's economy to say that long-terminism is no guarantee of success. Hence statement (1) is the answer.

Statement 2 – Short-term demands such as quarterly reporting schedules can force problems out in the open, the quicker to get them fixed. More important, short-termism can allow "creative destruction" to work its magic. Hence statement (2) is true and is not the answer.

Statement 3 – Long-termism works well in stable industries that reward incremental innovation. But it is a recipe for failure in such businesses as social media, where firms are constantly forced to abandon their plans and "pivot" to a new strategy, in markets that can change in the blink of an eye. Hence statement (3) is true and is not the answer.

Statement 4 – Nor are long-termism and short-termism mutually exclusive. General Electric, often praised for its long-term perspective, is trying to run itself more like a startup, to combat bureaucratic bloat. The author would agree with statement 4. Hence statement (4) is not the answer.

Statement 5 – The author would not agree with statement 5. All this is not to say that we should start chanting: "Short-term good, long-term bad". Rather, it is an argument for nuance. Long-termism and short-termism both have their virtues and vices – and these depend on context. Also refer to the last para of the passage. Hence statement (5) is the answer.

Ans: (15)

Solutions for questions 13 to 15:

Number of words and Explanatory notes for RC:

Number of words: 590

13. Refer to the last paragraph of the passage.

Option A: Today, graduate economists undergo "maths camp" before being bombarded with lectures. But too little focus is on getting real-world experience. So choice A is incorrect.

Option B: The author talks about getting real-world experience: visiting job centres, meeting entrepreneurs, spending time at a central bank or the national statistical agencies. But not at the cost of "honing their algebraic skills". "as much as algebraic prowess" has been mentioned in the last sentence of the passage. Also the author does not specifically say that economists should be trained to reach out to historians and sociologists. He only says that economists should get out more and mingle with historians and sociologists because influential research has come about when economists are willing to mix with others. Hence choice B is not the answer.

Option C: Choice C is correct. The economists should get real-world experience: visiting job centres, meeting entrepreneurs, spending time at a central bank or the national statistical agencies. Such work experience would increase the chances of theory being tied to practice. Exams would test critical reflection (for example, awareness of where the results a student is "proving" might not hold true) as much as algebraic prowess.

Option D: Choice D is also incorrect. The author is not against using mathematical skills. He is also not advocating that we abandon or throw away the mathematical models. He is only saying that we should not be overdependent on mathematical models. (Related to mathiness is model-mania). This is clear from his statement "My model is a model, not the model" which implies that mathematical models should be used with discretion.

Choice (C)

14. Refer to paras 2 and 3.

Option A: Choice A is absurd and cannot be ascertained from the passage. It does not help explain the quoted sentence as given in the question.

Option B: Economists are accused of being blinkered by mathematical models, of overestimating their predictive powers. Used responsibly, maths lends useful structure to economists' thinking, and weeds out sloppiness. Economists are good at reducing a complicated world to a few assumptions, then adding bells and whistles to make their models more realistic. But problems arise when they mistake the map for the territory. So choice B is correct.

Option C: The mountain of algebra in economic research is supposedly **meant for clarification** and rigour, but is too often deployed for obfuscation. While it has been mentioned in the fourth para that "related to mathiness is model-mania", choice C is incorrect.
Option D: While the first part of choice D is correct, the second part is not. But there needs to be a purge of maths-for-maths'-sake.

Choice (B)

15. Option A: "My model is a model, not the model." With a better sense of what is influencing behaviour in the economy, economists might become less blinkered by their own theory, and better able to foresee the next crisis. Meanwhile, they would be wise to repeat (daily) the quoted sentence given in the question. Hence choice A is correct.
Option B: Choice B cannot be decisively or conclusively ascertained from the passage. Choice A is more specific than choice B.
Option C: Choice C is incorrect. The author does not say that the mathematical theories on which economics is based are faulty.
Option D: Choice D is incorrect. The author gives importance to theory being tied with practice and to critical reflection. In the penultimate para, the author says that economists should mingle with historians and sociologists.

Choice (A)

Solutions for questions 16 to 18:

Number of words and Explanatory notes for RC:

Number of words: 376

16. The passage explains the termite hypothesis in the third paragraph of the passage.
Option A: This statement explains the self-organization hypothesis. This statement does not necessarily weaken the termite hypothesis. It only provides an alternative hypothesis for the formation of fairy circles. Hence, this is not the correct answer.
Option B: According to Juergens, "the fierce competition between neighbouring termite colonies causes the regular spacing of the circles". So the regular spacing between fairy circles is explained in the termite hypothesis and this statement does not weaken this hypothesis.
Option C: This statement made by Stephan Getzin weakens the termite hypothesis. If termites are not known to cause such patterns, then it will weaken the termite hypothesis because the basis of the hypothesis is contested. Hence, this is the correct answer.
Option D: The termite hypothesis does not explain fairy circles only in Australia or only in Namibia. Hence, this statement does not weaken the termite hypothesis.
Therefore, the correct answer is option C. Choice (C)

17. The passage mentions two places where fairy circles are found – Australia and Namibia.
Option A: Both in Australia and Namibia, fairy circles occur in deserts. But we cannot conclude from this that they occur only in deserts. Hence, this is not the correct answer.
Option B: According to Michael Cramer and Nichole Barger, "the fairy circles are restricted to places with low rainfall". Hence, they will be found only in places with low precipitation.
Option C: We cannot infer from the passage that the termite hypothesis is accurate in describing the formation of fairy circles. Hence, we cannot say that fairy circles will be found only in places with termite colonies.
Option D: While the passage mentions Australia and Namibia, we cannot conclude from the passage that they are not found in other places. Hence, this is not the correct answer.
Therefore, the correct answer is option B. Choice (B)
18. The passage explains the self-organization hypothesis in the last two paragraphs of the passage.

Option A: The penultimate paragraph of the passage explains why fairy circles form according to the self-organization hypothesis.

- Option B: Michael Cramer and Nichole Barger explain why the fairy circles "grow after dry years and shrink after wet ones" (because of the water in the central reservoir).
Option C: The low rainfall and scarce resources form a part in the formation of fairy circles, according to the self-organization hypothesis.

Option D: The passage mentions that fairy circles have "a lifespan of 30 to 60 years". However, the self-organization hypothesis fails to explain why they have a lifespan of 30 to 60 years. Hence, this is not explained by the self-organization hypothesis.

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

Solutions for questions 19 to 24:

Number of words and Explanatory notes for RC:

Number of words: 587

19. The meaning of the idiom "to throw a wild cat among the (pigeons)" is to do or say something that causes trouble and makes a lot of people angry or worried.
Option A: As long as the leadership of the physics community refuses to accept that string theory is a 'failed project', Woit writes, 'there is **little likelihood** of new ideas finding fertile ground in which to grow'. But "new discoveries can **never** be made" cannot be inferred from para 5. It would be incorrect to say that Woit arouses anger even though we know that the ruffled string-theory advocates will be preparing a rebuttal. So choice A is not the answer.
Option B: Woit's most compelling accusation, however, is that the domination of string theory in universities has stifled progress in alternative research programmes within theoretical physics. There is little likelihood of new ideas finding fertile ground in which to grow. And since an accusation would cause the accused to defend themselves, this is the equivalent of the cat among the pigeons. This makes choice B the correct answer.
Option C: We can be sure that the ruffled string-theory advocates will be preparing a rebuttal. But choice C is general and out of scope and it does not address the question.
Option D: The initial half of choice D is the literal meaning of the idiom "to throw a cat among the theoreticians". Choice D has been mentioned in the last para of the passage but it is out of context. "While his book tends to be negative, it **may** well shake up a community of **scientists (general)** that has evidently become complacent if not entirely ossified in its thinking" is the opinion of the author but it is not related to the use of the idiom "throw a wild cat among the **theoreticians (specific)**". Choice (B)

20. Woit, a humble math instructor, has nothing to lose in terms of academic standing, but physics might have much to gain from his boldness. If Woit can encourage string theorists to acknowledge the true difficulties of their discipline, and encourage young researchers to try neglected but promising alternatives, he will have succeeded in an important task.
Option A: Woit's boldness should encourage string theorists to acknowledge the true difficulties of their discipline. But choice A is extreme in tone and is not the implication. Choice A is not a gain of Physics mentioned in the last para of the passage.
Option B: Choice B though a possibility is not according to the passage. Hence choice B is not the answer. (The choice implies that someone is actually forcing the Physics scientists not to express their thoughts or the Physics scientists currently have a lot of fear in expressing their viewpoints.)
Option C: Choice C is too positive in tone and cannot be inferred from the passage.
Option D: From the last few sentences of the passage, we can say that choice D is true. The book may well shake up

a community of scientists that has evidently become complacent if not entirely ossified in its thinking. If he can encourage string theorists to acknowledge the true difficulties of their discipline, and encourage young researchers to try neglected but promising alternatives, he will have succeeded in an important task. Choice (D)

21. Option A: 'Not Even Wrong' was an epithet created by Wolfgang Pauli, an irascible early 20th-century German physicist. Pauli had three escalating levels of insult for colleagues he deemed to be talking nonsense: 'Wrong!', 'Completely wrong!' and finally 'Not even wrong!' But choice A is out of scope. There is no mention of Woit's opinion of Pauli in the passage.

Option B: Many of the exponents of string theory do not understand the complex mathematics it employs. The title of Peter Woit's book: "Not even wrong" might mirror "proved right by scientists" in choice B. But choice B is not a factual reason for the question. Hence choice B is wrong.

Option C: 'Wrong!', 'Completely wrong!' and finally 'Not even wrong!' By which Pauli meant that a proposal was so completely outside the scientific ballpark as not to merit the least consideration. In a similar manner, Peter Woit felt that string theory should not be given the slightest merit or consideration. Woit has challenged the entire string-theory discipline by proclaiming that its topic is not a genuine theory at all. String theory, he avers, has become a form of science fiction. Hence choice C is the correct answer.

Option D: While choice D is true from paras 4 and 5, it does not have anything to do with the title of Woit's book. Hence choice D is not the answer as it is not related to the question.

Choice (C)

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

Option B: In Peter Woit's view, string theory offers no foreseeable prospect of making predictions, a crucial criterion for any theory worthy of the name, due to a large number of available choices. So choice B is also a reason and is not the answer.

Option C: Woit's most compelling accusation, however, is that the domination of string theory in universities has stifled progress in alternative research programmes within theoretical physics. String theory, nowadays dominates the research programmes in many Western universities. So choice C is also a reason and is not the answer.

Option D: String theory can be understood only in terms of extremely sophisticated mathematics impenetrable to all but an elite of specialists. Peter Woit, a mathematician at Columbia University, has challenged the entire string-theory discipline by proclaiming that its topic is not a genuine theory at all and that many of its **exponents do not understand the complex mathematics** it employs. Hence choice D is a reason and is not the answer. If you are *out of your depth*, you are unable to understand a subject or deal with a situation because it is too difficult for you.

Choice (A)

23. Statement 1 can be inferred from the passage. Ultimately, he seeks not only to **rattle but to dismantle the cage** (intellectually imperial pretensions) of the string theorists. He grants that an explanation for gravity is usefully embedded in string theory, but he **challenges its authenticity** as proper science. Woit's most compelling accusation, however, is that the domination of string theory in universities has stifled progress in alternative research programmes within theoretical physics. Woit, a humble **math instructor**, has nothing to lose in terms of academic standing, but physics might have much to gain from his boldness.

Statement 2 cannot be understood from the passage. There are no lines to indicate that the author finds the book controversial. He feels that a furore is required among scientists. Refer to the last paragraph. Also "some areas of science (too general) are in danger of becoming "ironic science" is out of scope.

The author has not expressed the view mentioned in statement 3. So statement 3 is not correct.

Statement 4 is out of scope. While the author remains fairly objective about Woit's book through most of the passage, he expresses a highly favourable opinion of it in the last paragraph.

Statement 5 is correct from the last sentence of the passage. If he can encourage string theorists to acknowledge the true difficulties of their discipline, and encourage young researchers to try neglected but promising alternatives, he will have succeeded in an important task.

Statement 6 is incorrect. It would be wrong to say that the author feels that the book is a well researched but a biased piece of fiction. We only know that Peter Woit considered string theory to be a form of science fiction. So statement 6 expresses a negative view of Peter Woit and is incorrect.

Ans: (15)

24. Refer to paragraph 2. String theory, which nowadays dominates the research programmes and main funding of theoretical physics in many Western universities, was not so much discovered as invented in order to solve a vexing explanatory deficit.

Option A: Choice A may be true but this, in itself, is not what leads the author to call string theory an 'invented' theory. So choice A is not the answer.

Option B: Choice B is incorrect. The standard model and not the String theory sought agreement between the contrasting realms of super-huge objects, such as stars and planets, (known as relativity) and the super-small realms of the subatomic (known as quantum).

Option C: String theory was advanced simply to solve the 'vexing explanatory deficit' in existing theories instead of being propounded on its own merit. The standard model, however, failed to explain gravity. Enter string theory to rectify the problem. This makes choice C the answer.

Option D: Choice D is not relevant to the argument and is hence incorrect.

Choice (C)

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

SUB-SECTION: VA

Solutions for questions 1 to 4:

1. In the first sentence, a fort i.e. a structure is mentioned. 'Substantial' means large, solid and strongly built whereas 'substantive' means dealing with real, important or serious matters. Hence 1.

In the second sentence, 'Unapologetic', which means unwilling to apologize is the correct usage and not non-apologetic. Hence 2.

The correct word in the third sentence is 'authoritarian' which means believing that people should obey authority and rules, even when these are unfair, and even if it means that they lose their personal freedom. Authoritative means showing that you expect people to obey and respect you. Hence 2.

To clamour' means 'to raise an outcry' whereas 'to clamber' means 'to climb with effort or difficulty'. The stress on the awkward positioning of the pile of shoes makes 'clamber' more appropriate in the fourth sentence. Hence 1.

It can be said that a petition has been rendered 'infructuous' (cannot have a positive result) and not inoperative (not valid or able to be used). Hence 1.

Ans: (12211)

2. Reverse means a loss or defeat or a change from success to failure. Obverse means the opposite of something. Hence 1.

In the second sentence, the correct word is identical which means similar in every detail. From the sentence we can infer that Williams wanted to make a portrait that is exactly like Da Vinci's portrait but he could not. Similar means close but not exactly the same. Hence the appropriate word is 'identical'. Hence 2.

Credible means believable, reliable and creditable means deserving credit or praise; credible fits into the sentence since it is used as believable or reliable. Hence 1.

'Morbid' suggests an unhealthy mental state or attitude. 'Moribund' suggests that something is near death or is stagnant. As there is nothing unhealthy about a vehicle market, 'moribund' is more appropriate in this sentence. Hence 1.

In the last sentence, the correct word is 'raillery' which means friendly bantering about a person whereas 'railing' means a fence made of vertical metal bars. Hence 2.

Ans: (12112)

3. The correct word in the first sentence is 'replacement', meaning a person who replaces another person, especially in their job. 'Substitute' means to take the place of something else. Hence 2.

In the second sentence, the correct word is 'invoked' which means to mention a person, theory, example to support your opinion, idea, reason for something. Evoke means to bring a feeling, memory or image into your mind. Hence 1. To 'trot' means to 'go at a gait between a walk and a run' whereas a 'gallop' is a fast gait. The reference to "short panicky dashes" and 'terrified' makes 'galloped' more appropriate in the third sentence. Hence 1.

'Loath' is an adjective meaning unwilling or reluctant and 'loathe' is a verb (used with an object) which means to dislike greatly. In the context of the fourth sentence the latter fits better. Hence 2.

In the last sentence, characters and novels clearly indicate that it should be fictional which means not real or true, existing only in stories. 'Fictitious' means invented by somebody (as in an untruth). But since 'novel' is mentioned in the fifth sentence, the appropriate word is fictional. Hence 2.

Ans: (21122)

4. The correct word in the first sentence is 'envoy' which means a person who represents a government or organization and is sent as a representative to talk to other governments or organizations. An 'envoi' is a line or a group of lines which form the conclusion of a noun. This cannot fit in the context. Hence 2.

'Mulch' is a covering of straw, compost, or plastic sheeting, spread on the ground around plants to prevent excessive evaporation or erosion, enrich the soil, inhibit weed growth, etc. 'Mult' means 'to swindle' or 'to punish by fine'. Hence 1.

Complacent means self-satisfied and hence unconcerned; *complaisant* means inclined to please or oblige. *Complaisant* best fits in the third sentence. Hence 2.

In the fourth sentence, the correct word is 'intermediary' which means a person or an organization that helps other people or organizations to make an agreement by being a means of communication. Intermediate means located between two places, things, states etc. Hence 2.

Demure' means shy or modest, whereas 'demur' means to make objection. In the context of the sentence the former fits best. Hence 1.

Ans: (21221)

Solutions for questions 5 to 7:

5. Part (a): If the team is operating at 2 locations, both in Israel, and if we're referring to the members of this team, then the plural verb 'have' works. Part (a) is incorrect as there is a punctuation error. There is a comma required before 'both'. The part should read: and at Bar Ilan University in Ramat Gan, both in Israel, have developed a system that allows

In part (b), the preposition 'of' needs to be replaced with 'over'. The part should read: precise control over when a drug is active in the body.

Part (c) should read: that drugs can be tethered to.

Part (d) is error-free.

Part (e) needs an indefinite article 'a' before "body's exposure". The part should read: a body's exposure to the drug.....

So parts (a), (b), (c) and (e) will be represented by the number 0 and part (d) will be represented by the number 1. The correct answer is 00010. Ans: (00010)

6. In part (a), "defined by" does not make any sense. Religion is a system. It's not the system that defines religion. This should read "defined as".

In part (b), the correct usage should be 'practices' and not 'practises'.

In part (c), the expression 'is constituted of' is grammatically incorrect (unless you say 'a religion is constituted of'). The part should read: what actually constitutes a religion is subject to.....

Part (d) is also wrong because of the plural 'fields'. The singular form 'field' (of theology) needs to be used.

Part (e) is error-free.

So parts (a), (b), (c) and (d) will be represented by the number 0 and part (e) will be represented by the number 1. The correct answer is 00001. Ans: (00001)

7. Part (a) should read: billowing out of

Part (b) has an error of sentence construction. It should read: is both a source of concern and cheap energy. It can also read: is a source of concern as well as cheap energy.

Part (c) is error-free.

Part (d) has an error of punctuation. There should be a comma placed after "profits".

Part (e) needs the preposition "from" and not "for".

So parts (a), (b), (d) and (e) will be represented by the number 0 and part (c) will be represented by the number 1. The correct answer is 00100. Ans: (00100)

Solutions for questions 8 to 10:

8. The word 'copy' can fit the blank of sentence (v).

The word 'subject' can fit the blanks in sentences (ii) and (iv).

The word 'shine' can fit the blank of sentence (i).

The word 'account' can fit the blank of sentence (iii).

The word 'topic' can fit the blank of sentence (iv) in context of a particular discussion.

Since the word 'subject' can fit the blanks in two sentences, the correct answer is 2. Ans: (2)

9. The word 'accomplish' does not fit the blank in any sentence.

The word 'know' fits the blank of sentence (iii).

The word 'look' fits the blank in sentence (iv).

The word 'profile' fits the blank in sentence (i).

The word 'see' fits the blanks in sentences (ii) and (v).

Since the word 'see' can fit the blanks in two sentences, the correct answer is 2. Ans: (2)

10. The word 'close' can fit the blanks in sentences (ii), (iv) and (v).

The word 'sound' can fit the blank in sentence (iii).

The word 'open' can fit the blanks in sentence (ii) and (iv).

The word 'safe' can fit the blank in sentence (iv).

The word 'binge' can fit the blank in sentence (i).

Since the word 'close' can fit the blanks in three sentences, the correct answer is 3. Ans: (3)

Solutions for questions 11 to 13:

11. On a careful reading of the sentences, it can be observed that sentence (3) is a general sentence that begins the paragraph. {A proverbial statement or a statement (quote) made by others is best at the start or the end of a

paragraph. If placed in the middle of the para, it will disrupt the thoughtflow. Sentence 3 is followed by sentence 5. "last part of the expression" in statement 5 refers to "soon it cannot be broken" in statement 3. Sentence 5 is followed by sentence 2. "I know they can be broken" in sentence 2 links with "I personally do not agree" in sentence 5 and contrasts "soon it cannot be broken" given earlier in statement 3. Sentence 1 concludes the para. "Restoration is sometimes possible" in sentence 2 is linked with "this isn't a quick fix; it involves a process and a tremendous commitment" in sentence 1. So, 3521. Sentence 4 is the odd man out as it will need further elaboration and substantiation. It can serve as an introductory sentence of another para.

Ans: (3521)

12. On a careful reading of the sentences, it can be observed that sentence (4) is a general sentence that begins the paragraph. It tells us why connectors are important. Sentences 4 and 1 form a mandatory pair. "Connectors are important" in sentence 4 links with "Their importance is also a function" in sentence 1. Also "simply the number of people they know" in sentence 4 links with "also a function of the kinds of people they know" in sentence 1. Sentence 1 is followed by sentence 5. "understand this point" in sentence 5 refers to the opinion given in sentence 1. The name of the parlour game is also mentioned in sentence 5. Sentence 5 is followed by sentence 2 which explains the objective behind the game. "link any actor or actress, through the movies they have been in, to the actor Kevin Bacon in less than six steps" in sentence 2 explains the name of the game "Six degrees of Kevin Bacon" in sentence 5. So, 4152. Sentence 3 (But in the case of Connectors) is the odd man out as it does not provide an accurate contrast to any of the remaining sentences.

Ans: (4152)

13. On a careful reading of the sentences, it can be observed that sentence 1 is a general sentence that can begin the paragraph. It introduces "pharmacies in continental Europe" to us. Sentence 1 is followed by sentence 5. "Many are gleaming white, high-priced temples" in sentence 1 refers to "pharmacies" mentioned in sentence 5. "peddling cures for maladies not found in other lands" in sentence 5 hints at "liable to send blood pressure soaring" in sentence 1. Sentence 3 further explains a feature of the Pharmacy situation in Europe. Euro-pharmacists often offer, unasked, remedies based on homeopathy So sentence 3 follows sentence 5. Sentences 3 and 2 form a mandatory pair. "because many clients are not very ill and "homeopathic" sugar pills are cheap to make, quack cures offer low risks and high profits" in sentence 2 provides a reason for "Euro-pharmacists often offer, unasked, remedies based on homeopathy (magical powers)" in sentence 3. So, 1532. Sentence 4 needs a precedent and further substantiation. It can come later in the flow. Hence 1532.

Ans: (1532)

Solutions for questions 14 to 16:

14. On a careful reading of the paragraph, it can be inferred that the highlighted sentence does not belong to blank (1). The sentence is completely out of place in blank (1), as it interrupts the flow of thought. The highlighted sentence is negative in tone and cannot follow with the positive thought : calm such worries in America. Also the sentences prior to blank (1) talk about how Chinese policy makers were influenced by the Greek historian Thucydides. The pronoun "their" in the sentence after blank (1) refers to "Chinese policy works".

The highlighted sentence can be best placed in blank (2). The sentence prior to blank (2) (..... intended to calm such worries) is positive and the sentence succeeding blank (2) is negative (China's relations with America have deteriorated). The highlighted sentence is justified by the sentence(s) after blank (2).

The highlighted sentence is a misfit in blank (3). The sentence preceding blank (3) has some reference to America (American security umbrella) which finds a

continuation in the following sentence: Barack Obama's response has been a "pivot" towards Asia.

The highlighted sentence cannot conclude the given paragraph. There is no reference to "The ploy" in the penultimate sentence. "The ploy is not working" would need further elaboration and substantiation. It needs to be placed earlier in the text.

So the highlighted sentence best belongs to blank (2).

Ans: (2)

15. On a cursory reading of the paragraph, one can understand that the paragraph talks about the importance of "inner space".

The highlighted sentence best belongs to blank (1). Men and women have explored outer space, but personally I have always been much more fascinated with exploring inner space. The connection between inner space and outer space is explained in the sentence succeeding blank (1): Astronauts have often reported transformational experiences when they have looked back at Earth

The highlighted sentence does not belong to blank (2). The paragraph takes a new direction with the sentence preceding blank (2). The sentence states a comment of Thomas Merton: What can we gain by sailing to the Moon The highlighted sentence would interfere with the thoughtflow if placed in blank (2). "cross the abyss that separates us from ourselves" prior to blank (2) links with "This is the most important of all voyages of discovery" succeeding blank (2).

There is no indication or justification of 'a connection between the two' around the blank statement (3). Hence the highlighted sentence does not belong to blank (3).

The highlighted sentence is a poor example of a conclusion statement of the paragraph. It would need a precedent and more substantiation. The penultimate sentence of the para does not justify the use of "of course" as given in the highlighted sentence. So the highlighted sentence cannot belong to blank (4).

Ans: (1)

16. Blank (1) can be dismissed on the grounds that the comparison "harder to exert influence" as given in the highlighted sentence needs a precedent. The preceding sentence (throwing a dart blindfolded across an ocean and hitting the bullseye) provides an apt analogy to the European Space Agency depositing Philae on the surface of a comet 300 miles (480 m km) from the earth. This bit of information finds a continuation in the sentence succeeding blank (1): Philae fell silent soon afterwards, but not before dispatching reams of data and a shot of optimism to a continent that has had little to cheer.

The highlighted sentence best fits in blank (2). It provides an apt transition in the para at the correct point. The para first discusses the example of the European Space Agency being able to exert influence by depositing Philae on the surface of a comet 300 miles (480 m km) from the earth. After blank (2), the para goes on to explain that things are not so rosy for the European Union back on earth. The remaining sentences of the para justify or exemplify how the European Union finds it harder to exert influence – even over its neighbourhood.

The highlighted sentence again does not fit in blank (3) as it would need a precedent there and further elaboration which is not provided by the sentence succeeding blank (3).

The highlighted sentence is fairly superfluous in blank (4). It cannot complete the para as it would leave the thoughtflow incomplete.

Ans: (2)

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

SECTION – II
SUB-SECTION: DI

Solutions for questions 1 to 4:

It is given that no company incurred a loss during the given period.

For Company 1, the gap between the Revenues and Costs would be the least after three years. This is because in the first year, the percentage increase in revenues and cost is the same. However, in the second and third years, the percentage growth in cost was more than percentage growth in revenue. In the fourth year, the percentage growth is again the same. Hence, the gap between the revenues and costs will be the least for Company 1 after three years.

If R and C are the revenue and cost of Company 1 in 2011, the ratio of the cost to the revenue of Company 1 in 2014 would be

$$\frac{1.1 \times 1.15 \times 1.15 \times R}{1.1 \times 1.2 \times 1.25 \times C} = 0.88167 \times \frac{R}{C}$$

For Company 1 to definitely make a profit, the above ratio must be greater than 1, i.e., $\frac{C}{R}$ must be less than 0.88167.

Calculating the ratios of $\frac{C}{R}$ for the four companies in 2011 (from the table given), we see that the ratios for Sketch, Outline, Image and Picture are 0.8636, 0.84, 0.6875 and 0.92857 respectively.

Hence, Company 1 can only be one among Sketch, Outline or Image.

Using the same logic, the gap between Revenues and Cost will be the least at the end of 2014 for Company 2.

The ratio of the cost to the revenue of Company 2 in 2014 would be

$$\frac{1.1 \times 1.15 \times 1.15 \times R}{1.1 \times 1.25 \times 1.15 \times C} = 0.84174 \times \frac{R}{C}$$

For Company 2 to definitely make a profit, the above ratio must be greater than 1, i.e., $\frac{C}{R}$ must be less than 0.84174.

Hence, Company 2 can only be one among Outline or Image.

For Company 3, the gap between Revenues and Cost will be the least in 2013.

The ratio of the cost to the revenue of Company 3 in 2013 would be

$$\frac{1.05 \times 1.05 \times R}{1.2 \times 1.15 \times C} = 0.7989 \times \frac{R}{C}$$

For Company 3 to definitely make a profit, the above ratio must be greater than 1, i.e., $\frac{C}{R}$ must be less than 0.7989.

Hence, Company 3 can only be Image.

Hence, Company 2 will be Outline and Company 1 will be Sketch.

Therefore, Company 4 must be Picture.

(It is not necessary to calculate this ratio for Company 4.)

However, calculations show that for Company 4, $\frac{C}{R}$ must be less than 0.9583. Hence, Company 4 can be any one of the four companies.)

- Sketch is represented as Company 1 in the bar graph.
Choice (A)

- Revenue of Outline in 2014 = 347.875
Cost of Outline in 2014 = 347.15625
Profit = ₹0.71875 mn
Choice (D)

- The revenues, cost and profits of the four companies are given below:

	Revenues	Cost	Profit
Sketch	336.0	329.2	6.8
Outline	365.3	364.5	0.8
Image	242.6	200.4	42.2
Picture	244.4	226.9	17.5

Hence, the highest profit is for Image. Choice (C)

- The profit of Picture in 2012 = $140 \times 1.15 - 130 \times 1.2 = 5$

Similarly calculating for the other years, we find that the profits (in ₹mn) are 5.8, 15.9 and 17.5. Hence, the profit of Picture is greater than ₹10 mn in two years, 2014 and 2015.
Ans: (2)

Solutions for questions 5 to 8:

For each vegetable, let the price per kg be x, and the weight for which he paid be PW. Let the actual weight of the vegetables be AW.

Total Amount paid (TA) = $x \times PW$

Effective Price (EP) = $\frac{x \times PW}{AW}$

Monetary Loss (ML) = $x \times PW - x \times AW$

Now, $AW = \frac{TA}{EP}$, and $x = \frac{TA - ML}{AW}$, and $PW = \frac{TA}{x}$

The following table populates the values of Actual Weight, the weight he paid for (PW) and the price at which he purchased (x) for each of the vegetables:

Vegetable	Actual Weight	Weight Paid for	Price per kg
Onion	4.5	5	20
Tomato	3.2	4	16
Capsicum	1.25	2	28
Beans	2	2.5	35
Bitter gourd	4	5	21
Bottle gourd	2.5	4	5
Carrot	2.4	3	48
Potato	6.3	7	36

- The difference is the highest for Bottle Gourd (1.5 kg).
Choice (D)
- Price of Capsicum is ₹28 per kg.
Ans: (28)
- Sum of the actual weights = 26.15 kg
Choice (B)
- Sum of Forgone Weight = $0.5 + 0.8 + 0.75 + 0.5 + 1 + 1.5 + 0.6 + 0.7 = 6.35$ kg.
Choice (C)

Solutions for questions 9 to 12:

Let the following Venn diagram represent the number of persons who speak a language and play a sport:

The number of people who speak French = 37

Number of people who speak only English = $60 - 37 = 23$

From the diagram, $a + d + g = 23$

Number of people who speak English = 33

Number of people who speak only French = $60 - 33 = 27$

From the diagram, $c + f + i = 27$

Number of people who speak both the languages = $60 - 27 - 23$
 $= 10$

Number of people who speak French and play Hockey
 $= b + c + e + f = 24$

Number of people who play Hockey = $a + d + (b + c + e + f)$

$= 41$ ----- (1)

Therefore, $a + d = 41 - 24 = 17$

Since $a + d + g = 23$, $g = 6$.

Number of people who play Basketball and speak French
 $= e + f + h + i = 25$

Number of people who play Basketball = $d + g + (e + f + h + i)$
 $= 38$ ----- (2)

Combining the two equations, we get, $d + g = 38 - 25 = 13$

Since $g = 6$, $d = 7$ and $a = 10$.

Number of people who speak English and play Hockey
 $= a + b + d + e = 25$

From (1), $c + f = 41 - 25 = 16$

Since $c + f + i = 27$, $i = 11$

Number of people who speak English and play Basketball
 $= d + e + g + h = 20$

From (2), $f + i = 38 - 20 = 18$

Since $i = 11$, $f = 7$ and $c = 9$.

In equation (1), we know the values of all the variables except b and e .

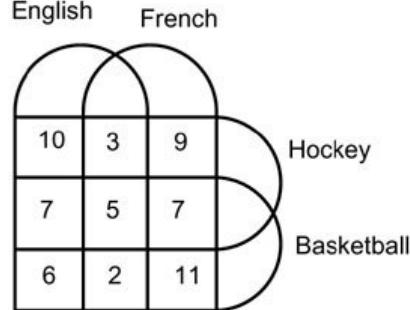
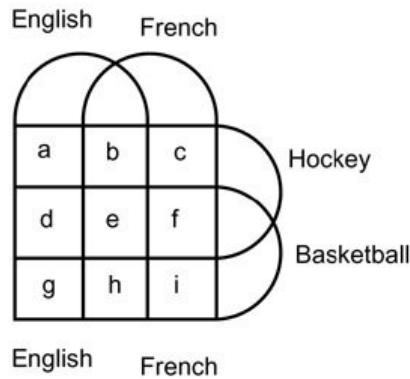
Substituting the values, we get $b + e = 8$.

Similarly, from equation (2), we get $e + h = 7$

Also, $b + e + h = 10$ (number of people who speak both the languages)

Hence, $h = 2$, $e = 5$ and $b = 3$.

The Venn diagram can now be filled with all the numbers:



9. Number of persons who speak both French and English and play both Hockey and Basketball = $e = 5$.

Ans: (5)

10. Number of persons speak French but not English and play Hockey but not Basketball = $c = 9$.

Ans: (9)

11. Number of persons who speak exactly one language and play only Hockey = $a + c = 10 + 9 = 19$.

Ans: (19)

12. The number of persons who play both Hockey and Basketball but speak only French = $f = 7$.

This is the same as the number of persons who play both Hockey and Basketball but speak only English which is $d (= 7)$.

Choice (D)

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

SUB-SECTION: LR

Solutions for questions 1 to 4:

Given that David gave a presentation on Automation in an even numbered room (from (i)). But David could not have given the presentation in room 2 (from (ii)). From (v), David could not have given the presentation in room 4. Hence, David must have given the presentation in room 6.

Since the room numbers in which Kiran and Bob gave their presentations are consecutive, it can be 1, 2 or 2, 3. (they could not have given their presentations in room numbered 4 or 6, since David and Jeeves gave their presentations in those rooms).

From (iv), Kiran did not give a presentation in room numbered 2. Hence, he could have given the presentation in room 1 or room 3. Bob would have given his presentation in room 2. From (ii), Bob would have given the presentation in Electronics.

From (ii), Chintu could not have given the presentation in room 5. He could not have given the presentation in room 3 (from (iv)). Hence, Chintu would have given the presentation in room 1.

Since Kiran could not have given the presentation in room 1, he must have given the presentation in room 3. From (iv), Kiran must have given the presentation on Animatronics.

Akbar would have given the presentation on Animation in room 5.

The following table presents the possibilities:

Person	Subject	Room Number
Akbar	Animation	5
Bob	Electronics	2
Chintu	Mechanics	1
David	Automation	6
Jeeves	Robotics	4
Kiran	Animatronics	3

1. Kiran gave the presentation on Animatronics.

Choice (C)

2. Akber gave his presentation in room 5.

Choice (B)

3. Jeeves and Kiran gave their presentations in consecutively numbered rooms.

Choice (D)

4. The presentation in room numbered 1 was on Mechanics.

Choice (C)

Solutions for questions 5 to 8:

If a cube of side n is laid out as described with i cubes, the number on y^{th} cube that is laid will be the remainder when y is divided by i . For example, if a cube of side 6 units is laid using 3 types of cubes (numbered 1, 2 and 3) as given in the first question, the number on the cube which is in the bottom right corner on the front face will be the 6th cube that is laid. Since 6, when divided by 3, leaves no remainder, this cube will be the cube numbered 3.

Let us consider the 38th cube to be laid in the same larger cube (where $n = 6$). This cube will be numbered 2 (since 38, when divided by 3, leaves a remainder of 2).

We can cross check this by imagining the 38th cube to be laid in this cube. 36 cubes will be laid in the bottom layer (since the side of the cube is 6 units). 37th cube will be the cube

immediately above the first cube in the bottom layer. 38th cube will be to the immediate right of the 37th cube. In the bottom layer, the last cube (36th cube) to be laid will be the cube numbered 3. The next cube (i.e., the 37th cube) will be the cube numbered 1 and the 38th cube will be the cube numbered 2.

5. For this question, we need to figure out the cubes along the body diagonal of the larger cube (of side 8 units).

The cube on the bottom left corner in the front row will be the first cube to be laid. After laying n^2 (64) cubes, the next cube ($n^2 + 1$) will be the cube immediately above the first cube. The second cube along the required diagonal will be $(n + 1)^{th}$ cube laid after this, i.e., the $(n^2 + n + 2)^{nd}$ cube to be laid. In other words, the next cube will be the cube which is laid 73 cubes after the previous cube.

Therefore, the cubes along the required diagonal will be the 1st, $(1 + 73)^{rd}$ cube = 74th cube, $(74 + 73)^{rd}$ cube = 147th cube, 220th, 293rd, 366th, 439th and 512th cubes to be laid. The remainder when these numbers are divided by 3 (i), will be 1, 2, 0, 1, 2, 0, 1 and 2. The sum of the numbers on the cube = $1 + 2 + 3 + 1 + 2 + 3 + 1 + 2 = 15$

Ans: (15)

6. The cube on the bottom right corner on the front of the cube will be the 10th cube to be laid. The cube which is immediately above this cube will be the 110th cube. The cube along the diagonal will be $110 + 10 = 120^{th}$ cube. Similarly, the next cube will be the 230th cube and so on.

Solutions for questions 9 to 12:

Given that Naren received an annual salary of ₹480000. His monthly salary could have been ₹80000 or ₹60000. If his monthly salary is ₹80000, he must have joined in July. This will violate condition (i). Hence, his monthly salary must have been ₹60000 and he must have joined in May.

From (ii), Gautam's salary cannot be ₹20000 (since Raj joined before him and drew a lower annual salary). Gautam' salary cannot be ₹80000 (from (iv), since Kumar's salary is more than that of Gautam).

If Raj's salary is ₹20000 and Gautam's salary is ₹30000, it is not possible for Gautam to have a greater annual salary than Raj (it can at most be equal). Hence, Gautam's annual salary must be ₹40000. Now Raj's salary cannot be ₹30000. If it is ₹30000, Gautam annual salary cannot be greater than that of Raj. Hence, Raj's salary must be ₹20000.

Raj could have joined between January and August. If Raj joined in August, his salary cannot be less than that of Gautam (since Gautam can have an annual salary of at most ₹40000). From (i), Raj could not have joined in July. If Raj joined in June, his salary will be ₹140000 and Gautam's annual salary will be at most ₹80000 (since Gautam can join only in November and not by October (from (i)). Since Naren joined in May, Raj could not have joined in May. If Raj joined in April, his annual salary will be ₹180000. Gautam must have joined in August with an annual salary of ₹200000. This is one possible case.

If Raj joined in March, Gautam could have joined in August (he could not have joined in July from (i)). This is also not possible. Raj could have joined in January and his annual salary will be ₹240000. Gautam could have joined in June (with an annual salary of ₹280000. This is another possible case.

From (iv), Kumar's monthly salary will be ₹80000 and Lalit's monthly salary will be ₹30000.

In the first case, Kumar's annual salary must be greater than Gautam's annual salary, ₹200000.

Lalit's annual salary can be a maximum of ₹360000 (if he joined in January). Kumar's annual salary can be ₹320000, if he joined in September. This satisfies condition (iv). Lalit could not have joined in February (from (i) or in March (since his salary will become ₹300000). Similarly, he could not have joined in any other month.

In the second case, the annual salary of Gautam will be ₹280000. Lalit's salary can be at most ₹300000 (since he could have joined only by March). However, Kumar's salary cannot be between ₹280000 and ₹300000 irrespective of when he joins. Hence, this case is not possible.

Therefore, only the first case is possible which is presented below:

Month	Jan	Apr	May	Aug	Sep
Person	Lalit	Raj	Naren	Gautam	Kumar
Monthly Salary (in ₹)	30000	20000	60000	40000	80000
Annual Salary (in ₹)	360000	180000	480000	200000	320000

The cubes along the diagonal will be the 10th, 120th, 230th, 340th, 450th, 560th, 670th, 780th, 890th and 1000th cube to be laid. The remainder when divided by $i = 4$ will be 2, 0, 2, 0, 2, 0, 2, 0, 2 and 0.

Hence, the sum on the faces of the cubes = $2 + 4 + 2 + 4 + 2 + 4 + 2 + 4 + 2 + 4 = 30$ Ans: (30)

7. The cube on the bottom right corner will be the 11th cube to be laid. The next cube along the diagonal will be the $11 + 121 + 10 = 142^{nd}$ cube. The next cube will be $142 + 121 + 10 = 273^{rd}$ cube.

Calculating the other cubes along the required diagonal we get the cubes as 11th, 142nd, 273rd, 404th, 535th, 666th, 797th, 928th, 1059th, 1190th and 1321st cubes. The numbers on the cubes will be 3, 2, 1, 4, 3, 2, 1, 4, 3, 2 and 1.

Required sum = 26 Ans: (26)

8. The cube which is second from left two rows behind the front row (in the bottom layer) will be the $4 + 4 + 2 = 10^{th}$ cube to be laid.

The cube which is above this will be the $10 + 16 = 26^{th}$ cube. The other cubes along this vertical column will be 42th and 58th cube.

The number on these cubes will be 10, 12, 14, 2. Required sum = 38 Ans: (38)

9. The annual salary received by Kumar in 2015 is ₹320000.
Ans: (320000)
10. Three persons joined the company before the end of June.
Ans: (3)
11. Gautam joined the company in August.
Choice (A)
12. Lalit received an annual salary of ₹360000.
Ans: (360)

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	6, 8
Very Difficult	5, 7

SECTION – III: QA

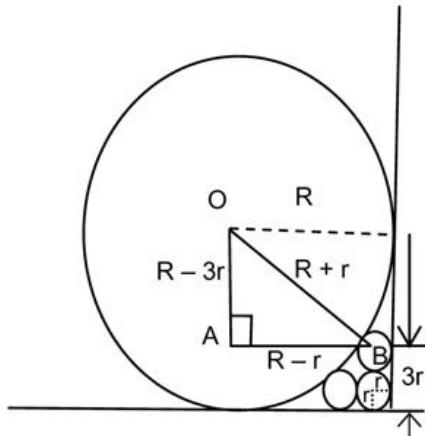
Solutions for questions 1 to 26:

1. It is given that, $81^{(t+1)} = 27^{(t-1)} \times 243^{(t-1)}$
 $\Rightarrow (3^4)^{(t+1)} = (3^3)^{(t-1)} \times (3^5)^{(t-1)}$
 $\Rightarrow 3^{(4t+4)} = 3^{(3t-3)} \times 3^{(5t-5)}$
 $\Rightarrow 3^{(4t+4)} = 3^{(8t-8)}$
Equating the powers (as the bases are same), we get
 $4^{(4t+4)} = 8^{(t-8)}$
 $\Rightarrow 4t = 12$
 $\therefore t = 3$
Choice (B)

2. $t \phi (t \phi t) = t \phi \left(\frac{t \times t}{t+t} \right) = t \phi \frac{t}{2}$
 $= \frac{t \times \frac{t}{2}}{t + \frac{t}{2}}$
 $= \frac{t}{3}$

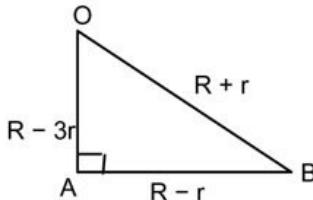
Now $\frac{t}{3}$ will be equal to an integer if t is a multiple of 3.
Therefore the possible values of t are all the multiples of 3 below 100.
Thus, there are 33 such natural numbers in the given range for which the given expression takes an integral value.
Ans: (33)

3. Let us denote the radius of the big circle by R and that of each of the small circles by r .



Let the centre of the top right smaller circle be B , and the centre of the bigger circle be O . Let the perpendicular dropped from O meet the horizontal drawn through B at A , such that $\angle OAB = 90^\circ$.

Using Pythagoras theorem,



$$\text{We get } (R + r)^2 = (R - 3r)^2 + (R - r)^2$$

$$R^2 + 2Rr + r^2 = R^2 - 6Rr + 9r^2 + R^2 - 2Rr + r^2$$

$$\Rightarrow R^2 - 10Rr + 9r^2 = 0$$

$$\Rightarrow (R - r)(R - 9r) = 0$$

$$R = 9r (\because R \neq r)$$

Therefore, the radius of the big circle

$$= 9r = 9 \times \frac{2}{3} = 6 \text{ cm.}$$

Ans: (6)

4. Let us consider the initial number of chocolates to be n . Let the number of chocolates remaining after each child took his share be n_1 , n_2 and n_3 . The number of chocolates claimed by the three grandsons will be $\frac{3}{12}n$, $\frac{4}{12}n_1$ and $\frac{5}{12}n_2$, where $n_1 = \left(1 - \frac{3}{12}\right)n$ and $n_2 = \left(1 - \frac{4}{12}\right)n_1$. Therefore, the number of chocolates that remained unclaimed, i.e., $n_3 = \left(1 - \frac{5}{12}\right)n_2$
- $$= \left(1 - \frac{3}{12}\right)\left(1 - \frac{4}{12}\right)\left(1 - \frac{5}{12}\right)n = \frac{7}{24}n.$$
- Thus, the fraction of the chocolates that remained unclaimed = $\frac{\frac{7}{24}n}{n} = \frac{7}{24}$

5. It is given that, p , $p + 2q$, $3p + q$ and 30 are in Arithmetic Progression.
 $\therefore p + (3p + q) = 2(p + 2q)$

$$2p = 3q$$

Therefore the terms (in terms of q) are $\frac{3q}{2}$, $\frac{7q}{2}$, $\frac{11q}{2}$ and $\frac{15q}{2}$

But $\frac{15q}{2}$, i.e., the fourth term = 30 (given)

$$\Rightarrow q = 4$$

and common difference = $2p = 8$.

$$\text{Thus the } 2016^{\text{th}} \text{ term} = 6 + (2016 - 1)8 = 16126$$

Choice (D)

6. For the average score per test at the end of each test to be an integer, the sum of the scores in the first two tests must be even, the sum of the scores at the end of three tests must be divisible by 3 and the sum of the scores at the end of four tests must be divisible by 4.

We start by considering his score at the end of three tests. We determine the remainders when the scores are divided by 3.

Score	104	125	133	148	175
Remainder	2	2	1	1	1

For the sum of the three scores to be divisible by 3, we need to take the first three scores such that the sum of the remainders is divisible by 3. Thus the scores to be taken are 133, 148 and 175, with the exact order not yet known.

Again, for the sum of the first two scores to be even, we need to take 133 and 175, in any order. Therefore, the third

$$\sin^2 \alpha + \cos^2 \beta + 2 \sin \alpha \cos \beta = \frac{4}{3} \text{ and}$$

$$\cos^2 \alpha + \sin^2 \beta + 2 \cos \alpha \sin \beta = \frac{8}{3}$$

Adding the two equations given above, we get

$$\sin^2 \alpha + \cos^2 \alpha + \sin^2 \beta + \cos^2 \beta + 2(\sin \alpha \cos \beta + \cos \alpha \sin \beta) = \frac{12}{3}$$

$$1 + 1 + 2 \sin(\alpha + \beta) = 4$$

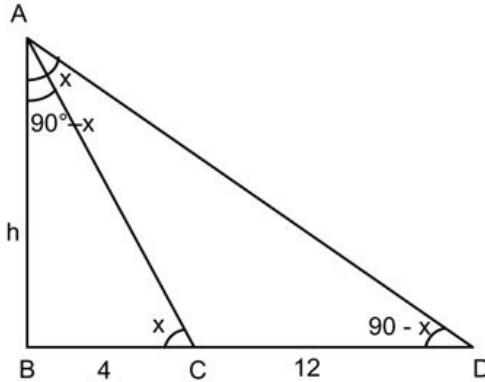
$$\therefore \sin(\alpha + \beta) = 1$$

$$\Rightarrow 6 \sin^2(\alpha + \beta) = 6(1)^2 = 6.$$

Ans: (6)

16. Let $\angle ACB = x$

$$\Rightarrow \angle BAC = (90^\circ - x)$$



Given $\angle ADB = (90^\circ - \angle ACB)$, i.e., they are complementary
 $\Rightarrow \angle ADB = (90^\circ - x)$ and $\angle BAD = x$ ($\because \triangle ABD$ is right angled)

Let $AB = h$

By observation, $\triangle DBA \cong \triangle ABC$

$$\therefore \frac{AB}{BC} = \frac{BD}{AB}$$

$$\Rightarrow AB^2 = BC \times BD$$

$$\Rightarrow h^2 = 4 \times (4 + 12) = 64$$

$$\Rightarrow h = 8$$

$$\text{and area of } \triangle ABD = \frac{1}{2} (AB)(BD) = \frac{1}{2} \times 8 \times 16$$

$$= 64 \text{ sq. cm.}$$

Alternative Solution:

Let angle ACB be α .

$$\therefore \angle ADC = 90 - \alpha.$$

[$\because \angle ACB$ and $\angle ADC$ are complementary]

$$\tan \alpha = \frac{AB}{BC} \text{ and } \tan(90 - \alpha) = \frac{AB}{BD}$$

$$\Rightarrow (\tan \alpha)(\tan(90 - \alpha)) = \left(\frac{AB}{BC}\right) \left(\frac{AB}{BD}\right)$$

$$\Rightarrow (\tan \alpha)(\cot \alpha) = \frac{(AB)^2}{4 \times 16}$$

$$\Rightarrow \frac{AB^2}{64} = 1 [\because \tan \alpha \cot \alpha = 1]$$

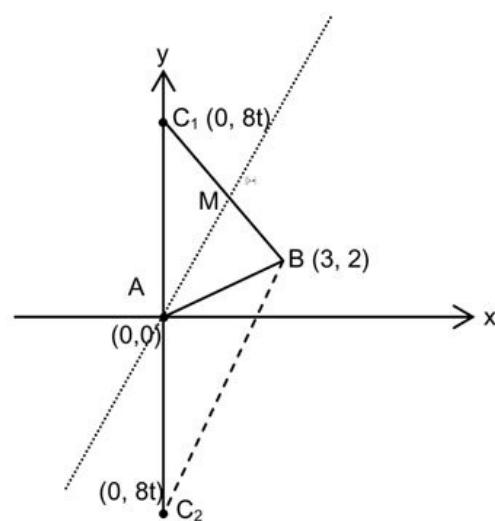
$$\therefore AB = 8$$

$$\text{Thus, the area of } \triangle ABD = \frac{1}{2} (AB)(BD)$$

$$= \frac{1}{2} (8)(16) = 64 \text{ sq. cm}$$

Choice (D)

17. There will be two values of t depending on t being positive or negative. Let us denote the points $A(0, 0)$, $B(3, 2)$ and $C_1(0, 8t)$ [when t is positive] and $C_2(0, -8t)$ [when t is negative].



For the line $x = ty$ to divide the area of the triangle into two triangles of equal area, the line must pass through the midpoint of BC_1 (or BC_2) (since triangles with equal bases and same height will have equal areas).

$$\text{Midpoint (M) of } BC_1 = \left(\frac{3}{2}, \frac{2+8t}{2}\right), \text{i.e., } \left(\frac{3}{2}, 1+4t\right)$$

Now, $x = ty$ passes through this point

$$\therefore \frac{3}{2} = t(1+4t)$$

$$\Rightarrow 3 = 2t + 8t^2$$

$$\Rightarrow 8t^2 + 2t - 3 = 0$$

$$\Rightarrow 8t^2 - 4t + 6t - 3 = 0 \Rightarrow (2t-1)(4t+3) = 0$$

$$t = \frac{1}{2} \text{ or } t = -\frac{3}{4}$$

Therefore, the sum of all the possible values of t =

$$S = \frac{1}{2} - \frac{3}{4} = -\frac{1}{4}$$

$$\Rightarrow 12S = -3.$$

Ans: (-3)

18. It is given that, $f(x) = ax^2 + bx + c$

To find the value of $a + b + c$, we can simply determine the value of $f(1)$.

It is given that, $f(x+5) = 2x^2 + 15x + 29$

Putting $x = -4$ in the above equation, we get

$$f(1) = 2(-4)^2 + 15(-4) + 29 = 1$$

$$\therefore a + b + c = 1.$$

Alternative solution:

$$f(x+5) = a(x+5)^2 + b(x+5) + c$$

$$= a(x^2 + 10x + 25) + bx + 5b + c$$

$$= ax^2 + (10a+b)x + 25a + 5b + c$$

$$\text{Now, } f(x+5) = 2x^2 + 15x + 29.$$

\therefore Comparing the coefficients we get $a = 2$, $10a + b = 15$ and $25a + 5b + c = 29$

$$\Rightarrow b = -5 \text{ and } c = 4.$$

$$\therefore a + b + c = 2 - 5 + 4 = 1$$

Ans: (1)

19. The given conditions of seating will be satisfied if the boys sit in seat 1, seat 3, seat 5 and seat 7.

We arrange the four boys in $4!$ Or 24 ways.

Let us denote one such arrangement as follows:

B _ B _ B _ B

Now, the three girls can be arranged in between the boys in $3!$ Or 6 ways.

Therefore, total number of arrangements = $(4!)(3!)$

$$= 144 \text{ ways}$$

Ans: (144)

20. It can be observed in the figure that $f(-2) = f(2) = 0$.

$$\therefore -8a_0 + 4a - 2a_2 + a_3 = 0 \rightarrow (1)$$

$$8a_0 + 4a_1 + 2a_2 + a_3 = 0 \rightarrow (2)$$

Adding the two equations, we get

$$8a_1 + 2a_3 = 0.$$

$$a_1 = \frac{-a_3}{4}$$

$$\text{Again, } f(0) = a_3 = -4.$$

$$\therefore a_1 = \frac{-(-4)}{4} = 1$$

Ans: (1)

21. N persons can do the job in 15 days.

Thus, the work when considered in man days is (N) 15

Similarly, the same work = (N + 6) (15 - 3)

$$\therefore 15N = 12(N + 6) \Rightarrow 3N = 72$$

$$\therefore N = 24$$

Choice (A)

22. It is given that $|x+y| + |x-y| = 6$

If $x+y \geq 0$, then $|x+y| = x+y$ and if

$x+y < 0$, then $|x+y| = -(x+y)$

Again if $x-y \geq 0$, then $|x-y| = x-y$ and if

$x-y < 0$, then $|x-y| = -(x-y)$

Applying the above conditions, we get four cases

I $x+y \geq 0, x-y \geq 0 \Rightarrow x+y+x-y=6 \Rightarrow x=3$

II $x+y \geq 0, x-y < 0 \Rightarrow x+y-x+y=6 \Rightarrow y=3$

III $x+y < 0, x-y \geq 0 \Rightarrow -x-y+x-y=6 \Rightarrow y=-3$

IV $x+y < 0, x-y < 0 \Rightarrow -x-y-x+y=6 \Rightarrow x=-3$

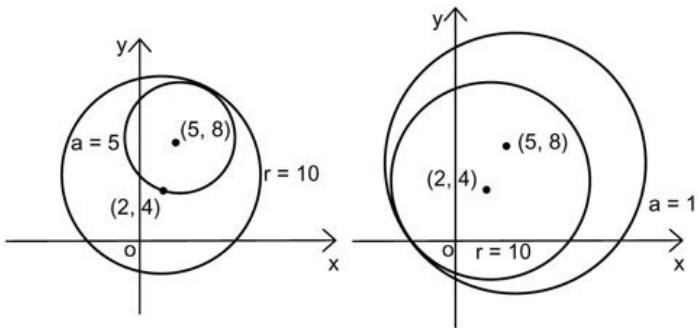
Now, $x^2 + y^2 + 5xy$ will be minimum when xy is negative and when one of x and y is 3 and the other is -3.

$$x^2 + y^2 + 5xy = (\pm 3)^2 + (\pm 3)^2 + 5(-9)$$

$$= 9 + 9 - 45 = -27$$

Therefore, the minimum value of $x^2 + y^2 + 5xy$ is -27.

Ans: (-27)



if $10 - 5 \leq a \leq 10 + 5$

i.e., $5 \leq a \leq 15$.

Therefore a can assume a total of 11 integral values

Ans: (11)

$$26. x^2 = \sqrt{98} - \sqrt{96} = \sqrt{2}[\sqrt{49} - 2\sqrt{12}]$$

$$= \sqrt{2}[7 - 2\sqrt{12}] = [2^{\frac{1}{4}}(2 - \sqrt{3})]$$

$$\therefore x = 2^{\frac{1}{4}}(2 - \sqrt{3})$$

$$y^2 = \sqrt{128} + \sqrt{120} = \sqrt{2}[8 + 2\sqrt{15}] = [2^{\frac{1}{4}}(\sqrt{5} + \sqrt{3})]^2$$

$$\therefore y = 2^{\frac{1}{4}}(\sqrt{5} + \sqrt{3})$$

$$z^2 = \sqrt{338} - \sqrt{320} = \sqrt{2}[13 - 2\sqrt{40}] = [2^{\frac{1}{4}}(\sqrt{8} - \sqrt{5})]^2$$

$$\therefore z = 2^{\frac{1}{4}}(\sqrt{8} - \sqrt{5})$$

$$\therefore x + y + z = 2^{\frac{1}{4}}(2 - \sqrt{3} + \sqrt{5} + \sqrt{3} + \sqrt{8} - \sqrt{5})$$

$$= 2^{\frac{1}{4}}(2 + 2\sqrt{2}) = 2^{\frac{5}{4}}(1 + \sqrt{2})$$

Alternative Solution:

Since all the terms in the question and answer choices involve only square roots and n^{th} roots where n is even

(i.e., $2^{\frac{3}{2}}, 2^{\frac{5}{4}}$ etc.), this equation can be solved by using

the online calculator provided, which has the squareroot function.

$$x = \sqrt{\sqrt{98} - \sqrt{96}} \approx 0.319$$

$$y = \sqrt{\sqrt{128} + \sqrt{120}} \approx 4.719$$

$$z = \sqrt{\sqrt{338} - \sqrt{320}} \approx 0.705$$

$$\therefore x + y + z \approx 5.78$$

Now, considering the approximate values for $\sqrt{2}, \sqrt{3}$ and $\sqrt{5}$ as 1.414, 1.732 and 2.24 (calculator is not necessary

for these approximations) and $2^{\frac{1}{4}} = \sqrt[4]{2} \approx 1.2$ (since $\sqrt{1.44} = 1.2$), we can quickly evaluate each choice and see that choice (A) is less than 4, whereas choices (B) and (C) are both greater than six (no need for exact calculations). Hence, by elimination only choice (D) can be the answer.

Choice (D)

23. We know that, $f(f^{-1}(x)) = x$.

$$\therefore f(nx - 4) = x$$

$$m(nx - 4) + n = x$$

$$mnx - 4m + n = x$$

Equating the coefficient of x , we get $mn = 1$.

Alternative solution:

$$f(x) = y = mx + n$$

$$\Rightarrow x = \frac{y-n}{m}$$

$$\therefore f^{-1}(x) = \frac{x-n}{m} = \frac{x}{m} - \frac{n}{m} = nx - 4$$

$$\therefore \frac{x}{m} = nx$$

$$\Rightarrow mn = 1$$

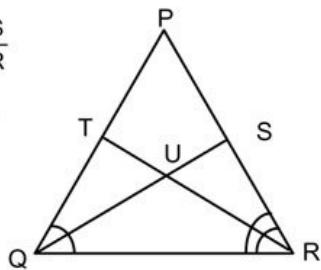
Choice (A)

24. By the angle bisector theorem,

$$\frac{PQ}{QR} = \frac{PS}{SR}$$

$$\Rightarrow \frac{9}{6} = \frac{PS}{SR}$$

$$\therefore \frac{PS}{SR} = \frac{3}{2}$$



It is given that $PR = 5$ cm.

$\Rightarrow SR = 2$ cm and $PS = 3$ cm.

Now, RU is the bisector of angle SRQ .

$$\therefore \frac{QR}{RS} = \frac{QU}{US}$$

$$\Rightarrow \frac{QU}{US} = \frac{6}{2} = \frac{3}{1}, \text{ i.e., } 3 : 1.$$

Choice (D)

25. The equations represent circles of the form $(x - g)^2 + (y - f)^2 = r^2$ where r is the radius of the circle with its centre at (g, f) .

$$\text{Now, } x^2 + y^2 - 4x - 8y - 120 = 0$$

$(x-2)^2 + (y-4)^2 = 10^2$ is the equation of a circle with the centre at $(2, 4)$ and radius 10.

$$\text{Similarly, } x^2 + y^2 - 10x - 16y + 89 = a^2$$

$\Rightarrow (x-5)^2 + (y-8)^2 = a^2$ is the equation of a circle with the centre at $(5, 8)$ and radius a . The distance between the centres of the two circles = $\sqrt{(5-2)^2 + (8-4)^2} = 5$

Now the two circles will intersect each other (as shown in the figure below)

Difficulty level wise summary - Section III: QA

Level of Difficulty	Questions
Very Easy	1, 11, 21
Easy	2, 8, 9, 13, 16, 18, 19, 23
Medium	4, 5, 7, 10, 12, 14, 15, 20, 22, 24, 25, 27
Difficult	3, 6, 17
Very Difficult	