

**(Key and Solutions for AIMCAT1716)**

**Key**

**SECTION – I**  
**SUB-SECTION: RC**

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

**SUB-SECTION: VA**

1. 24153	3. 51432	5. 3	7. 2	9. B
2. 31542	4. 25143	6. 4	8. D	10. A

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

1. C	4. A	7. D	10. D	13. B
2. D	5. 46	8. B	11. B	14. B
3. C	6. 45	9. 500000	12. D	

**SUB-SECTION: LR**

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

**SECTION – III: QA**

1. B	7. C	13. B	19. 41	25. C
2. C	8. 50	14. A	20. 8191	26. B
3. 480	9. 23	15. A	21. B	27. 1
4. C	10. D	16. C	22. D	28. C
5. C	11. B	17. B	23. 2	
6. 90	12. 210	18. 29	24. -4	

**Solutions**

**SECTION – I**  
**SUB-SECTION: RC**

**Solutions for questions 1 to 6:**

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

Number of words : 699

- Refer to Extract 1. Both parties (Johnny, the young Australian boy and his older friends) had different perceptions of the game. The boy played the game for profit, but the older boys thought they were smarter than him.

Option A: Johnny's friends giggled and reckoned that

Johnny was very stupid because he did not yet know that the smaller coin was worth twice as much as the bigger coin. But Johnny benefited by not taking the two-dollar coin. So choice A can be inferred and is not the answer.

Option B: From Johnny's reply to the bystander, "But how many times would they have offered me the coins if I had taken the two dollar coin the first time", we can infer that choice B is true. So choice B is not the answer.

Option C: Whenever they wanted to demonstrate Johnny's stupidity, Johnny's friends would repeat the exercise. They expected him to pick the bigger coin and he did. So the older Australian kids (Johnny's friends) knew right from wrong and thought that Johnny did not.

However Johnny was slyly collecting one-dollar coins.

Hence choice C can be inferred and is not the answer.

Option D: Choice D is not true. The young Australian boy was making a profit by pretending to be dim-witted and that suited his perception. It's clear that Johnny knew of the actual value of the coin. He did not operate from standard perception or expected norms. So we cannot say that the younger Australian kid was not being crafty. Hence choice D is the answer.

Choice (D)

2. Option A: Choice A is true from an overall reading of Extract 2.

Option B: The first sentence of Extract 3 mentions: The most difficult thing for all of us is to look at anything with a genuinely open mind. The second sentence of para 2 in Extract 3 mentions: We are not able to break away from the cage and think differently. So, our inability to look at things differently stems from our inadequacy in looking at things with a genuinely open mind. Hence we can infer (from the boldfaced part of Extract 2 and the discussion on 'perception' in Extract 3) that choice B is true and is not the answer.

Option C: Choice C is not true. Refer to the first sentence of extract 2 after the quotation of Joseph Campbell. When you apply an old framework to a new idea, chances are you will not see the full potential of what is possible. The idea of the second example is: Park your car while fooling someone. But finding a parking space is not a new problem. It is an old problem which all of us have faced. Because the author says: "What most of us would have done..... We would have looked for a vacant parking space. And driven around till we found one." So choice C is a false statement and is the answer.

Option D: The penultimate sentence of Extract 2 mentions: Our perception is that you can't park your car in a space already occupied. This is a wrong perception. The author's friend was a creative person and he came up with an interesting solution. The author's friend perceived/ visualized his car parked in a space already occupied. Hence choice D is true and is not the answer.

Choice (C)

3. Refer to Extract 3. Our knowledge, experience, education, upbringing, culture, beliefs, assumptions are the bars of our mental cage and they colour our perceptions. We are not able to break away from the cage and think differently. We are not able to look at new ideas differently because our view is obstructed by the bars of our mental cage. This makes choice B correct.

Option A: Choice A is the opposite of what is mentioned in Extract 3. Hence choice A is not the answer.

Option C: Choice C attempts a pictorial explanation but does not provide an implication of the statement. Hence choice C is not the answer.

Option D: The penultimate sentence of Extract 3 recommends that we should let people with different perceptions alter our understanding of the issue. Similarly, solutions to a problem from a group of people with different perceptions could throw up a range of possibilities we could never have thought of. But choice D is secondary and does not primarily address the situation "We are not able to break away from the cage". Choice D is not the implication and is not the answer.

Choice (B)

4. Option A: Both illustrations (examples mentioned in Extract 1 and Extract 2) are used to prove that when innovative thinking strategies are employed, success is possible. The last sentence of each extract (..... **benefited when he did not operate from standard perceptions**), in fact, restates choice A. Hence Choice A is correct and is the answer.

Option B: While "innovative thinking is a way to success" in choice B is correct, the phrase "comparable situations" in choice B makes it incorrect.

Option C: "ought to be innovative in our thinking" is a role played by the example mentioned in the first extract. But "one needs to **actively participate** to find creative solutions to one's problems" is not the role played by the

example mentioned in Extract 2. (The author only mentions in Extract 3 that we need to look at new ideas differently without allowing our perceptions to be coloured by the bars of our mental cage. Throughout Extract 3, the author's refrain is that our thinking is influenced by our set perceptions i.e. the old framework). So choice C is not the answer.

Option D: Choice D is metaphoric by itself but does not adequately address the roles played by Extract 1 and Extract 2. It does not state the relationship between the two extracts.

Choice (A)

5. Refer to the second paragraph of Extract 3. We are not able to break away from the cage and think differently. We are not able to look at new ideas differently because our view is obstructed by the bars of our mental cage. Refer also to the third paragraph of Extract 3. Perceptions affect both the way we tend to define a problem, as well as the way we see solutions. I see this every time I am working with a client who wants to get help.

Option A: The author does not attempt to prove the idea mentioned in the question. This makes choice A wrong.

Options B & C: The author does not refute the idea nor does he consider it a matter of dispute. Hence choices B and C are incorrect.

Option D: The author takes this idea for granted i.e. it is an assumption of the author in this passage. Hence choice D is correct.

Choice (D)

6. People benefited when they did not operate from standard perceptions.

Option A: Choice A is the main lesson or moral of the passage. Throughout Extract 3, the author's refrain is that our thinking is influenced by our set perceptions. The old framework (bars of our mental cage) needs to be broken. We need to think differently. We need to look at new ideas differently. Hence choice A is true and is not the answer.

Option B: In the first example of the passage (given in Extract 1), Johnny's friends expected Johnny to pick the bigger coin. In the second example (given in Extract 2), if we were in the place of the author's friends, we would have looked for a vacant parking space and driven around till we found one. Our perception is that we can't park our car in a space already occupied. So Choice B is the thesis that the author develops in the course of the passage. Hence choice B is true and is not the answer.

Option C: The author mentions in Extract 3 that a client's preconceived notions (about the root cause of problems and the consequences of solutions) could be misleading. Hence he does not advocate that we give importance to our predetermined perceptions. He advocates that we think differently and look at new ideas differently without letting our viewpoint be coloured by the bars of our mental cage. Hence choice C (..... rather than think out of the box) is not true and is the answer.

Option D: Choice D can be gathered from the penultimate para of Extract 3: convert that to an advantage ..... different perceptions could alter our understanding of the whole issue ..... could throw up a range of possibilities we could never have thought of. Hence choice D is the author's recommendation and can be the advice dished out by a mentor, coach or facilitator.

Choice (C)

#### Solutions for questions 7 to 12:

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

Number of words : 609

7. According to Michael Roth, students should "come and work hard because they can leverage their experience at the university and do something after they leave".

Option A: If the four years that student spend in college turn out to be best four years of their lives, it defeats the purpose of college, according to Michael Roth. This is

because, he feels that the students should prepare for their lives after college in college. Hence, this is what Michael Roth implied when quoted his predecessor.

Option B: While he feels that students should work hard, he did not mention that students should not enjoy their time at college. Hence, this option is incorrect.

Option C: Roth states that students should not feel as if they are a part of an exclusive club. As this option states the opposite, this cannot be the correct answer.

Option D: In the passage, Roth does not talk about the extracurricular activities. Hence, this option is also incorrect.

Therefore, the correct answer is option A.

Choice (A)

8. According to the passage, the professionals who conferred at University of Southern California feel that the intense competition of admissions "undermines students' well-being; pressures applicants to fine-tune their test-taking skills and inflate their resumes; and distorts the purpose of higher education".

Option A: While the passage mentions that the students inflate their resumes because of the competition, the passage does not mention that the delegates at the conference were of the opinion that the students should not distort their resumes. Hence, this option is incorrect.

Option B: The passage mentions that there is a need for reform. Also, the passage mentions that the admission process fuels intense competition among the students. Hence, this is the correct answer.

Option C: The passage does not talk about removing tests as one of the admission criteria. Hence, this option is also incorrect.

Option D: The delegates at the conference did not talk about the importance of extracurricular activities. Hence, this option is also incorrect.

Therefore, the correct answer is option B.

Choice (B)

9. The passage mentions that "the USC/Education Conservancy event did little to change the status quo at selective colleges".

Option A: According to the passage, the people who recruit applicants are "relatively low-paid twenty somethings". However, the passage does not mention that they are not educated. Hence, this cannot be the correct answer.

Option B: The passage does not talk about the educators being unaware of the ground reality. Hence, this cannot be a reason.

Option C: The passage states that the people who recruit applicants are rarely "venerable educators". This implies that there is a disconnect between the educators who frame the educational objectives and the people who recruit applicants. Hence, this option is correct.

Option D: We cannot infer from the passage that the applicants do not care about the educational objectives. Hence, this option is also incorrect.

Therefore, the correct answer is option C.

Choice (C)

10. Turning the Tide campaign aims to focus on "the character-building potential of the admissions process".

Option A: Turning the tide campaign wants colleges to "encourage applicants to engage in "meaningful, sustained community service," contribute to their families, and focus on the quality (versus the quantity) of extracurricular activities". Hence, it plans to develop empathy among the students. We can infer that the aim of Turning the Tide campaign is to develop empathy among students through college admissions. Hence, this is the correct answer.

Option B: Changing the perception of students such that they treat college as the beginning of their educational journey is an objective of the USC event. Hence, this is not the correct answer.

Option C: We cannot infer from the passage that Turning the Tide is trying to dissuade colleges from accepting students solely based on their academics. We can only

infer that it wants the character of the students to be developed through admissions. Hence, this option is also incorrect.

Option D: De-emphasizing test scores and admissions selectivity is one of the aims of USC event. Hence, this option is also incorrect.

Therefore, the correct answer is option A.

Choice (A)

11. The passage mentions that some people are sceptical about the approach of Turning the Tide. The last para tells us that there are already some schools where 'empathy' is a criterion, and that there are already some applicants 'padding' their resumes. Further, 'gaming' the system would mean using the provisions to one's advantage. What Michael Roth really fears is that those who currently present themselves as empathetic (but may not really be so) would have a system that they would be able to milk.

Option A: Michael Roth fears that the new system may be gamed by the students. However, he does not mention that it will be unfair to some applicants. Hence, this option is incorrect.

Option B: Michael Roth feels that students who "pad their resumes with all kinds of activities that supposedly show empathy" will now have a larger number of schools to apply to because of the new systems. Hence, this option is the correct answer.

Option C: While students may inflate their resumes, this is not mentioned as one of the reasons for some people being sceptical of the approach that Turning the Tide follows. Hence, this option is also incorrect.

Option D: We cannot infer from the passage whether this will increase the competitive nature of the admission process. Hence, this option is also incorrect.

Therefore, the correct answer is option B.

Choice (B)

12. The passage states that "at the other end of all that work is what many critics describe as a lottery – even the most qualified students are merely gambling to get in".

Option A: The admission process does not usually leave out the deserving candidates. The subjective nature of the process may result in some candidates not being able to get through. Hence, this option is incorrect.

Option B: The passage does not talk about admission process awarding students who are highly competitive. Hence, this option is also incorrect.

Option C: The element of luck involved, the author describing the admission process as a lottery does not imply that the admission process is objective. Hence, this option is also incorrect.

Option D: The author highlighted the element of luck involved in admission process. Therefore, we can say that the admission process is subjective and there is an element of luck involved. Hence, this is the correct answer.

Choice (D)

#### Solutions for questions 13 to 18:

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

Number of words : 758

13. Some geologists, who may feel that their science is dangerously clever, are **snappish** about Iapetus. 'Snappish' means 'ill-natured', 'irritable' and 'curt'; 'likely to snap'.

Option A: One meaning of 'splenetic' is "affected or marked by ill humor or irritability." Hence choice A is not the answer.

Option B: Crusty means easily irritated. Hence choice B is incorrect.

Option C: Testy means easily irritated; impatient and somewhat bad-tempered. So choice C is not the answer.

Option D: Aphorism means a tersely phrased statement of a truth or opinion; an adage. Aphoristic would be the adjective that presents that as a manner. Hence choice D

is farthest from the meaning of the word 'snappish' and is the answer.  
Choice (D)

14. Reading the first and second paras of the passage, one can easily zero in on choice C as the answer. The first para explains how plate tectonics has helped the earth. The second para explains what has helped plate tectonics. The other options are imprecise.

Choice (C)

15. Statement a: From the first paragraph, we know only of the beneficial aspects of plate tectonics. It provides a stable climate and helps to create mineral deposits. The para does not tell us that plate tectonics is responsible for earthquakes and volcanoes. Hence statement (a) cannot be inferred.

Statement b: There is no data in the passage to infer statement (b).

Statement c: Statement (c) is true from the last two sentences of para 6: Milankovitch had proposed that ice ages were caused by variations in the Earth's orbit around the sun. Yet the lack of information about other possible factors affecting climate (such as volcanic particulates or variations in the amount of sunlight received by the earth) does not make them unimportant.

Statement d: According to the first sentence of the seventh paragraph, glaciers come and go in cycles of about a hundred thousand years, not a hundred million years. Statement (d) cannot be true.

Statement e: From the fourth and fifth para, we can say that statement (e) is not true.

Choice (A)

16. When the occurrence of the ice age becomes doubtful on account of some reason, it casts the most serious doubt on the conclusion.

Option A: Choice A only compares the consequences of ice ages with those of global warming. It does not discount the possibility of occurrence of ice age.

Option B: Choice B weakens the claim of some scientists that predictions of global warming are unfounded. Hence choice B is the answer.

Option C: Choice C, if anything, only strengthens the conclusion, as it adds to the possibility.

Option D: Choice D, if anything, only strengthens the conclusion.

Choice (B)

17. Statement a: Statement a can be understood to be true. The focus is on the geological processes that have taken place in one particular part of the world in the past billion years: the opening and closing of Iapetus, the formation of the Atlantic ocean and the Appalachian mountains, the successive ice ages in Canada, New England, New York, New Jersey, Pennsylvania, and the Middle West etc.

Statement b: Statement b is true. It can be inferred from the tale of the raising of the Appalachian Mountains mentioned in para 4 as well as from the story of the Atlantic and proto-Atlantic oceans in the third and fourth paras.

Statement c: Statement c can be inferred from the last two sentences of the passage. The Holocene will last until a glacier two miles thick plucks up Toronto and deposits it in Tennessee. If that seems unlikely, it is only because the most southerly reach of the Pleistocene ice fields to date stopped seventy-five miles shy of Tennessee.

Statement d: Statement d can be inferred from the last two sentences of para 3: Some geologists, who may feel that their science is dangerously clever, are **snappish** about Iapetus. They prefer to say proto-Atlantic.

Statement e: The second para tells us that the planet has to be just the right size. If it is too small, its lithosphere will be too thick. So we can infer that the lithosphere of the earth is not too thick. But the Earth's gravitational field cannot hold the tectonic plates rigidly in their position. So statement e cannot be inferred.

Choice (D)

18. Refer to the penultimate paragraph. The author states that some geologists call the last ten thousand years the 'Holocene epoch' to differentiate them from the Pleistocene, which was the 'Ice Age'. But according to the

author, the current epoch is merely a short deglaciated interval between ice ages, so he is skeptical that the term 'Holocene epoch' has any real meaning. The viewpoint of the author reiterates this: Scientists now know Homo sapiens arose more than 200,000 years ago in the Pleistocene epoch ..... His conclusion is that humans are a Pleistocene species, so the reason for calling the Holocene an epoch is a relic of the past.

Choice (C)

#### Solutions for questions 19 to 21:

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

Number of words : 574

19. Option A: Poison gas was first used in the First World War in April 1915, during the battle for Ypres. However, statement A specifically says "poison gas was first used in the world". The passage does not say tell us that the First World War was the occasion when poison gas was used for the first time. The sixth para says that despite the use of poison gas, "the Canadian forces were able to stabilize their lines and fall back in good order to more defensible positions". From this we cannot infer that the Canadians vanquished the Germans despite the use of poison gas. So choice A is not correct.

Option B: The Canadian Corps suffered the highest number of casualties in the battle of the Somme. So choice B is correct. Casualties are referred to as "heavy losses". (Note: A 'major loss' would be a significant defeat, or a loss of territory/position held).

Option C: Choice C is not true. It has been mentioned in para 3 that non-white people and those born in enemy nations like China, Germany and Japan were not welcomed into the military. Also in the fourth para, it has been mentioned that the soldiers of the Corps were mostly volunteers as conscription (or drafting or the compulsory enlistment of people in a military service) was not implemented until the end of the war.

Option D: All four Canadian divisions fought together as a single Corps for the first time in the battle of Vimy Ridge (April 1917) and not the battle of Somme. In the battle of the Somme, the Canadian divisions fought separately and then rejoined the Canadian Corps at Vimy Ridge.

Choice (B)

20. It has been mentioned in para 2 that Canadians of British descent (or origin) – the **majority** – gave widespread support arguing that Canadians had a duty to fight on behalf of their Motherland. 620,000 men and women **volunteered** in the war by enlisting as nurses, soldiers and chaplains. This makes choice A correct. Choices B and C are out of scope. The first part of choice D is correct. However, it is not the primary reason for the question. The Canadian government had the freedom to determine the country's level of involvement in the war. The second part of choice D is incorrect. People volunteered to serve in the war. They were not compelled to participate in the war.

Choice (A)

21. Option A: Looking at the fourth option closely, we cannot say anything about how crucial the Canadian Corps was to the British Army, as details of the other divisions/ battalions and war units have not been mentioned. Also, we cannot take the victories of the Canadian Corps as evidence that the Battalion was crucial to the British Army.

Option B: Choice B is limited to the fourth para of the passage and not serve as the primary objective of the author. Hence choice B is not the answer.

Option C: Choice C covers the breadth of the passage thoroughly. The first sentence of the passage starts with "The military history of Canada during World War I .....". In the middle of the passage, we have "The highpoints of Canadian military achievement during the Great War came during the Ypres, Somme and Vimy battles." This makes choice C correct.

Option D: Choice D is very general and does not mention any detail about Canada's role in the First World War. So choice D is incorrect.  
Choice (C)

#### Solutions for questions 22 to 24:

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

Number of words : 487

22. The passage talks about a study that will be published in which it is mentioned "Recent gains or losses change how the human brain assesses risk". Further, according to Kaisa Hytönen "The experience of gain or loss appears to reduce your deliberation".

Option A: The passage mentions that basing investment decisions on recent results is inefficient (according to Frank Armstrong). Further, recent gains or losses results in investors taking bigger risks. Understanding the impact of recent gains or losses, hence, can help investors identify the reduced deliberation while taking decisions and can help them make well thought out decisions. Hence, this is the correct answer.

Option B: The passage mentions that recent gains or losses will result in investors taking riskier decisions. However, we cannot infer from the passage whether this will result in a loss or a gain. Hence, this cannot be the correct answer.

Option C: The passage presents a view that taking decision based on impulse and emotions is not an efficient strategy for investing. The study states the impact of recent gains or losses on the brain which results in making decisions which are not deliberate. Hence, understanding the impact of recent gains and losses on the brain will not help investors take emotional decisions.

Option D: We cannot infer from the passage that understanding the impact of recent losses or gains will help the investors take more risks. Hence, this option is incorrect.

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

23. According to Frank Armstrong, some investors adjust "their asset allocation based on recent past results". He calls this a "self-defeating" desire.

Option A: Since Frank Armstrong calls this a self-defeating desire, it strongly implies that he does not feel that it will increase the profits of the investors. Hence, this option cannot be the correct answer.

Option B: Armstrong mentions that the markets are efficient. And he does not mention about the investors' decisions affecting the efficiency of the market. Hence, this option is also not the correct answer.

Option C: Changing asset allocation based on recent results is a "self-defeating" desire. Further, he also refers to such investors as inefficient. Hence, this strategy of investing is inefficient, according to Armstrong. Therefore, this is the correct answer.

Option D: While this is mentioned in the subsequent paragraph, this cannot be inferred from Frank Armstrong's comments. Hence, this option is also incorrect.

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

24. The passage mentions various ways in which investors can refrain from taking emotional decisions.

Option A: The passage mentions that "Learning from other people's remorse now may help you minimize your own later". Hence, learning to manage emotions from other people will help the investors.

Option B: While this could be an inference, it is not mentioned in the passage. Hence, this is the correct answer.

Option C: According to the passage, "making gradual changes to your investing plan" will "likely to keep you from doing anything rash". Hence, this is also helpful for investors.

Option D: The passage mentions the views of Daniel

Kahneman, according to whom, "one of the keys to investing successfully is properly anticipating your regret".

Therefore, the correct answer is option B.

Choice (B)

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

#### SUB-SECTION: VA

##### Solutions for questions 1 to 4:

1. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the paragraph. It provides the background of the story: the author was at a meeting in England ..... Sentence 2 also has a lot of proper nouns (Mars, England, Royal Society of London .....), the season and the year (spring of 1974) and states the objective of the meeting (to explore the question of how to search for extraterrestrial life). Sentence 2 is followed by sentence 4. "at a meeting" in sentence 2 is followed by "a much larger meeting was being held in an adjacent hall" in sentence 4. Sentence 4 ("out of curiosity I entered") is followed by sentence 1 ("On entering the hall"). So, 241. Sentence 1 (On entering the hall, I realized ..... ) is followed by sentence 5 ( In the front row a young man in a wheelchair was .....). "most ancient" in sentence 1 echoes with "earliest" in sentence 5. Sentences 5 and 3 form a mandatory pair. The "young man" in sentence 5 refers to "Stephen Hawking" mentioned in sentence 3. Hence 24153.

Ans: (24153)

2. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence which begins the paragraph. It introduces 'Canadian hockey' and says that it is a meritocracy. (Meritocracy refers to an elite group of people whose progress is based on ability and talent rather than on class privilege or wealth. It is a system in which the talented are chosen and moved ahead on the basis of their achievement.) Sentence 3 is followed by sentence 1. "The sport" in sentence 1 refers to "Canadian hockey". Sentence 1 tells us when Canadian boys begin to play football: at the "novice" level, before they are even in kindergarten. Sentence 1 is followed by sentence 5. "From that point on" in sentence 5 refers to "before they are even in kindergarten" in sentence 1. Sentence 5 tells us that there are leagues for every age class and at each level, players are evaluated. Sentence 5 ("From that point on") is followed by sentence 4 (By the time players reach their midteens.....). "The very best of the best have been channeled into an elite league" (sentence 4) happens after the process mentioned in sentence 5 (At each level, the players are sifted and sorted and evaluated, with the most talented separated out and groomed for the next level.) Sentence 4 also introduces "Major Junior A" which is an elite league and represents the top of the pyramid. Sentences 4 and 2 form another mandatory pair. "Major Junior A, which is the top of the pyramid" in sentence 4 is linked with "And if the Major Junior A plays for the Memorial Cup, that means you are at the very top of the top of the pyramid" in sentence 2. Sentence 2 ends the paragraph on a climax and sums up the viewpoint mentioned in the introduction sentence: Canadian hockey is a meritocracy. Hence 31542.

Ans: (31542)

3. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence which begins the paragraph. It introduces Belle Isle which has a rock

fortress situated forty miles to the east of Marseilles. Sentence 1 follows sentence 5. The fortress houses six hundred prisoners ..... Sentences 1 and 4 form a mandatory pair. The pronoun "them" in sentence 4 refers to "prisoners" mentioned in sentence 1. So, 514. Sentences 3 and 2 in that order expand on why no one can escape from Belle Isle (which has been mentioned in sentence 4). Sentence 3 follows sentence 4. "no one has ever escaped from Belle Isle" in sentence 4 links with "No vessel may approach closer than four miles" and "closely monitored by an excellent approach radar system" in sentence 3. Sentence 2 follows sentence 3. "Belle Isle has another highly efficient protection system provided by nature itself" in sentence 2 follows "closely monitored by an excellent approach radar system" in sentence 3. Hence 51432.

Ans: (51432)

- On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the paragraph. It provides the background: **Our story** stars two twins: Stella and Terence. Sentence 2 is followed by sentence 5. It tells us what the protagonists do in the story. One stays at home and the other flies off to space. Sentence 1 poses a question and follows sentence 5. "Stella returns (from space)" in sentence 5 links with sentence 1 ("When **our heroes** meet again"). Sentences 1 and 4 form another mandatory pair. The question (Did time slow down for Stella, making her years younger than her home-bound brother?) posed in sentence 1 is followed by the question (Or can Stella declare that the Earth did the travelling, so Terence is the younger?) posed in sentence 4. Sentence 3 concludes the para by supporting the first view given in sentence 1. "Stella ages less than Terence" in sentence 3 links with "Did time slow down for Stella, making her years younger than her home-bound brother?" given earlier in sentence 1. So, 25143.

Ans: (25143)

#### Solutions for questions 5 to 7:

- 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 line "Carpe Diem. Seize the day, boys. Make your lives extraordinary". It has the year reference 1989 and the proper nouns: *Dead Poets Society*, John Keating and Robin Williams. Sentence 4 (which introduces "Carpe Diem") is followed by sentence 2 {Related but distinct is (another) expression "memento mori"}. "Memento mori" carries some of the same connotation as "carpe diem". Sentence 5 follows sentence 2 as it tells us how listeners will interpret the two phrases ("carpe diem" and "memento mori") today. ""memento mori" urging us to resist its (life's) allure" in sentence 5 links with "This is not the original sense of the "memento mori" phrase as used by Horace" in sentence 1. Sentence 1 reminds us of the original meaning of the phrase "memento mori" as used by Horace and completes the paragraph. So, 4251. Sentence 3 is the odd sentence out as it runs tangent to the paragraph. It is related more to the movie *Dead Poets Society* than to a discussion about "Carpe Diem". Ans: (3)
- On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the paragraph. It states the background: There is a striking difference between Russian and Chinese peasant proverbs. Statement 5 follows sentence 3 as it provides an example of a typical Russian proverb. The viewpoint mentioned in sentence 2 (That's the kind of fatalism and pessimism .... peasants have no reason to believe in the efficacy of their own work) is related to the proverb mentioned in sentence 5. So sentence 2 follows sentence 5. Sentence 1 concludes the paragraph by saying how Chinese proverbs are different. "hard work, shrewd planning and self-reliance or cooperation with a small group will in time bring recompense" in sentence 1 contrasts "peasants have no reason to believe in the

efficacy of their own work" in sentence 2. Hence 3521. Sentence 4 is the odd sentence out. There is a reference in this sentence to "rice paddies" and "paddy fields" which needs a precedent and more substantiation.

Ans: (4)

- 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: the reaction of people who watched the lunar voyage of Apollo 11. Sentences 5 and 1 form a mandatory pair. "transfixed as we saw the first men walk on the moon and return to earth" in sentence 5 links with "Superlatives such as "fantastic" and "incredible" were inadequate" in sentence 1. Sentence 4 follows with the contrast conjunction 'but'. The tremendous gravity pull of the earth was a big hurdle for the astronauts. Sentences 4 and 3 form a mandatory pair. "break out of the tremendous gravity pull of the earth" in sentence 4 is linked with "Most energy was spent in the first few minutes of lift-off" in sentence 3. Sentence 2 digresses from the topic a bit by focussing on breaking deeply imbedded habitual tendencies or habits. It can be a part of the next paragraph which tells us that habits also have tremendous gravity pull and breaking out of them or "lift-off" would need tremendous effort. Sentence 2 is the odd sentence out as it will need further clarification.

Ans: (2)

#### Solutions for questions 8 to 10:

- The paragraph mentions that coffee can be converted into an alternative fuel: biodiesel. Choice A would support coffee as an alternative fuel. Coffee could be used as a biofuel if it is not a primary food source (and though many of us believe that we stay alive only because of our coffee, remember that the question statement says 'if true!'). Choice B also supports the use of coffee as an alternative fuel. The oil from coffee can be converted into biodiesel. Choice C which highlights the importance of antioxidants in coffee also supports the use of coffee as an alternative fuel. Hence choice D is the answer.  
Choice (D)
- From the phrase "catch them young", we can infer that young minds are impressionable. So choice A is incorrect. It is not the assumption. From the last sentence of the paragraph (carefully isolate them from all contact with books or companions capable of making them think), one can say that choice B is the assumption. Choices C and D are not relevant to the discussion in the paragraph.  
Choice (B)
- When Karan Johar says, "The combination cannot fail ....", he assumes that filmstars alone can influence the success of a film. The success of the film does not depend on any other factor. When the director included India's brightest movie stars Amitabh Bachchan, Shah Rukh Khan, Hritik Roshan, Jaya Bachchan, Kajol and Kareena Kapoor in *Kabhi Khushi Kabhie Ghum*, he had kept in mind the Hollywood release starring Sean Connery, Tom Cruise, Leonardo Di Caprio, Audrey Hepburn, Julia Roberts and Kate Hudson which was a hit. So choice A is the assumption. Choice B is a generalized statement and is besides the point. The paragraph tells us the importance of movie stars and not the relevance of the money spent in making the film. Choices C and D are out of scope.  
Choice (A)

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

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

**Solutions for questions 1 to 4:**

- The price of the ticket will be less than USD 100 for the first six customers for each flight. The number of customers for CA-543, CA-187 and CA-923 are 8, 5 and 7 respectively. Hence, a total of 3 customers would have paid at least USD 100.  
Choice (C)
- The following table segregates the customers based on their flight, arranges the above data in chronological order and presents the price of each ticket:

CA-187			CA-543			CA-923		
Customer	Time	Price	Customer	Time	Price	Customer	Time	Price
Aurora	11:41	70.00	Aria	09:54	70.00	Charlotte	10:15	70.00
Nora	12:32	72.22	Ava	10:24	72.22	Elijah	12:18	72.22
Olivia	13:51	75.00	Aiden	11:23	75.00	Elliott	14:18	75.00
Caleb	16:11	78.57	Declan	13:12	78.57	Benjamin	15:45	78.57
Alexander	21:16	83.33	Scarlett	16:17	83.33	Emilia	17:25	83.33
			Ethan	16:41	90.00	Violet	20:05	90.00
			Emma	19:24	100.00	Emmett	22:51	100.00
			Finn	19:52	116.67			

By observing the above table, we can see that the difference between Finn's ticket and any other ticket will be at least 16.67 (compared to the previous person). We, therefore, can first check the difference in the prices of the ticket of Finn and the ticket sold before/after his ticket. Since Finn purchased at 19:52, the person who purchased the ticket before him purchased it for 100 (Emma at 19:24). The person who purchased the ticket after him purchased it for 90 (Violet at 20:05). The difference in the latter case will be USD 26.67. Among the choices, only one other choice is higher than 26.67, i.e., 30. But 30 is possible only for ticket prices of 100 and 70. By observation, this combination is possible only for the pairs – Emma with Aurora/Charlotte; Emmett with Aurora/Aria. But none of these purchased their tickets consecutively. Therefore, the highest difference is USD 26.67.

Choice (D)

- From the table in the above question, we can see that after 15:00 until 17:30 no one paid less than USD 75 and more than USD 100.  
Choice (C)
- Average price  

$$= \frac{72.22 + 75 + 83.33 + 100 + 90 + 100}{6} = 86.76$$
  
Choice (A)
- Given that  $d + g = c \Rightarrow d + 4 = c \Rightarrow d = c - 4$   
Hence,  $c \geq 4$ .

To maximize the number of people who have drawing as their hobby, the sum of  $a, d, g$  and  $e$  should be maximum. Given  $g = 4$ . Further  $d + e + f = 18$ . To maximize  $d + e$ , we can take  $f = 0 \Rightarrow d + e = 18$ .

For  $a$  to be maximum,  $c$  must be minimum.

Hence, if  $c = 4$  and  $b = 0, a = 24$ .

∴ The number of people who have drawing as their hobby =  $24 + 18 + 4 = 46$   
Ans: (46)

- Given that  $a + d + g + e \geq 13 \Rightarrow a + d + e \geq 9$ . Since  $d$  can be a maximum of 7,  $a + e$  will be at least 2. Since  $e + c + f \geq 14$  (i.e.,  $18 - g$ ),  $e$  can be taken as 2.  $f$  can be at least 9. Hence,  $c$  has to be at least 3. Then  $b$  can be at most  $28 - 3 = 25$ .

The maximum number of people who have Numismatics as their hobby =  $b + (d + f) + g = 25 + 16 + 4 = 45$   
Ans: (45)

- Given that  $b = 18$ . Hence,  $a + c = 10$

Hence,  $a \leq 10$ . From the options, the answer is 5.  
Choice (D)

**Solutions for questions 8 to 11:**

We have to find what each column represents in the given table.

Consider Company 1. Using the formula for Asset Turnover, A, B, C, D, E, F or G divided by Total Assets must be equal to one among these 7 values. These values are 0.3, 0.6, 0.083, 0.35, 1.5, 0.333, 0.35 respectively. Among these values, only 0.6 (in

Column A) is present in the table. Hence, B/Total Assets = A. Therefore, B must be Net Sales and A must be the Asset Turnover Ratio.

Similarly, using the formula for Leverage, Total Assets divided by C, D, E, F or G must be equal to one among these five values. These values are 11.98, 2.86, 0.667, 3, 2.86 respectively. Hence, Total Assets/E = F. Hence, E and F must be Leverage and Shareholders' Equity in any order.

We still need to find C, D and G. These three must represent Total Cost, Debt Equity Ratio and Return on Equity in any order.

Since the values in columns D and G are the same for Company 1, let us consider Company 8. Return on Equity for Company 8 must be  $\frac{2.4 - (C \text{ or } D \text{ or } G)}{E \text{ or } F}$ . This can take six different values

which are 0.948, 6.832, 0.125, 0.9, 0.861 and 6.207. Of these six values, only 0.125 is present in the table (column C). 0.125 is obtained using Total cost as 2.1 (in column D) and Shareholders' Equity as 2.4 (in column E). Hence, column C represents Return on Equity, column D represents Total Cost, column E represents Shareholders' Equity and column F represents Leverage. Hence, column G must represent Debt Equity Ratio.

8. The Asset Turnover (column A) for Company 5 is 0.613.  
Choice (B)

9. Net Sales is in column B and Total Cost is in column D. The highest Net Profit is for Company 1, which is ₹500,000.  
Ans: (500000)

10. Total Debt can be calculated by multiplying Debt Equity Ratio (column G) with Shareholders' Equity (column E). Company 2 has the highest Debt (₹3.2 mn) while Company 5 has the second highest Total Debt (₹3.1 mn).  
Choice (D)

11. Option A: Highest Net Sales = Company 7; Highest Total Cost = Company 3 → False  
Option B: Lowest Return on Equity = Company 6; Lowest Asset Turnover = Company 6 → True  
Option C: Highest Leverage = Company 4; Lowest Return on Equity = Company 6 → False  
Option D: Lowest Shareholders' Equity = Company 4; Lowest Debt Equity Ratio = Company 7 → False  
Hence, options B is true.  
Choice (B)

#### Solutions for questions 12 to 14:

12. By observation, we need to check for the four countries – G, F, D and B.

$$\text{Number of Luxury cars in G} = 4 \times 35 = 140$$

$$\text{Number of Luxury cars in F} = 8 \times 26 = 208$$

$$\text{Number of Luxury cars in D} = 11 \times 24 = 264$$

$$\text{Number of Luxury cars in B} = 15 \times 14 = 210$$

The highest number of luxury cars is in D. Hence, the answer is none of the above.  
Choice (D)

13. We can calculate the number of movie theatres in J, I, C, H and D. The number of movie theatres in the other countries will be less than those in these countries.

$$\text{Number of movie theatres in J} = 21 \times 13 = 273$$

$$\text{Number of movie theatres in I} = 18 \times 16 = 288$$

$$\text{Number of movie theatres in C} = 14 \times 18 = 252$$

$$\text{Number of movie theatres in H} = 13 \times 21 = 273$$

$$\text{Number of movie theatres in D} = 11 \times 24 = 264$$

Hence, the highest number of movie theatres in any country will be for I which will be

$$\frac{18}{10000} \times 16mn = 28800 \quad \text{Choice (B)}$$

14. Apart from J, I, C, H and D, all the other countries have less than 25000 movie theatres.

Among the other countries, either F or B will have the highest number of luxury cars.

$$\text{Number of luxury cars in F} = 8 \times 26 = 208$$

$$\text{Number of luxury cars in B} = 14 \times 15 = 210$$

Hence, the highest number of luxury cars is 21000.  
Choice (B)

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

#### SUB-SECTION: LR

##### Solutions for questions 1 to 3:

Let the movies be BB, GD, SPT, SLH, and PB.

From iii, iv and v, we know that Horner is the Actor, Atkinson is the writer, and Moore is the actress.

None among the writer, the actress, the actor, and the Director worked for SLH. Therefore, the Editor should have worked in that film. The Writer and the actress could have worked for SPT or GD. The following table gives the information about the relation.

Person	Occupation	Film	Won/Lost
Hepburn/Murray	Director	BB	Lost
Atkinson	Writer	SPT/GD	Won
Moore	Actress	GD/SPT	Won/Lost
Horner	Actor	PB	Lost
Murray/Hepburn	Editor	SLH	Lost/Won

1. Since Moore did not win an award, SLH must have won an award.  
Choice (A)
2. Hepburn/Murray could have worked for Breaking Bread.  
Choice (D)

3. From (i), we know that Murray is the Director and Hepburn is the editor.  
 From (ii), we find that Atkinson should have worked for GD (since SPT did not win any award), and Moore worked for SPT and did not win. Therefore, the editor would have won. Hence, these two statements are sufficient to determine the exact relation. With the other options, it is not possible to determine the exact relationships.

Choice (A)

#### Solutions for questions 4 to 7:

Let AM, DE, SP, CM and SM represent the five subjects.  
 From (ii), Piyush met the CM professor first. From (i), Steve met the SP professor third. From (iv), Madhu met the SM professor first and the SP professor second.

From (iii), we can infer that Piyush must have met four professors immediately after Steve met them. For one professor, Piyush would have met him first and Steve would have met him last.

Hence, Piyush would have met SP professor fourth and Steve would have met CM professor last.

Naveen can meet the SP professor either 1<sup>st</sup> or 5<sup>th</sup>. From (i), he could not have met SP professor first. Hence, he met the SP professor 5<sup>th</sup> and SM professor 4<sup>th</sup>. Hence, Ravi would have met SP professor 1<sup>st</sup>.

Steve and Piyush must have met the SM professor 3<sup>rd</sup> and 2<sup>nd</sup> respectively (since Naveen and Madhu met him 4<sup>th</sup> and 1<sup>st</sup> respectively).

From (ii), since Piyush is not the last to meet the DE professor, Steve cannot be the 4<sup>th</sup> to meet the DE professor. Hence, he

has to meet the DE professor 1<sup>st</sup> and the AM professor 4<sup>th</sup>. Piyush would have met the AM and DE professors 5<sup>th</sup> and 2<sup>nd</sup>.

Also, Ravi would have been the 5<sup>th</sup> to meet SM professor and Naveen would have met the AM professor 1<sup>st</sup>. He would have met the CM professor 2<sup>nd</sup> and the DE professor 3<sup>rd</sup>. Ravi would have met DE professor 4<sup>th</sup> and Madhu would have met him 5<sup>th</sup>. Ravi would have met the AM professor 2<sup>nd</sup> and Madhu would have met him 3<sup>rd</sup>. Madhu would have met the CM professor 4<sup>th</sup> and Ravi would have met the CM professor 3<sup>rd</sup>. The following table presents this information:

	AM	DE	SP	CM	SM
Naveen	1	3	5	2	4
Madhu	3	5	2	4	1
Piyush	5	2	4	1	3
Ravi	2	4	1	3	5
Steve	4	1	3	5	2

4. At 10:18 a.m., Steve was meeting the Advanced Mathematics professor. Choice (B)
5. The first student to meet the Digital Electronics professor was Steve. He was the last student to meet the Classical Mechanics professor. Choice (C)
6. Piyush was the fourth student to meet the Signal Processing professor. Choice (D)
7. Three students met the Classical Mechanics professor before Madhu met him. Ans: (3)

#### Solutions for questions 8 to 11:

Let A, H, J, K, L, R and S represent the seven persons. From (iii), Switch was flipped twice and Switch 2 was flipped twice  $\Rightarrow$  Switch 3 was flipped thrice. Given that Robert was the only person to flip Switch 3 off. This implies that two others would have flipped it on. For this to happen the switch must initially be off. The first person in the queue cannot be K (from(i)), S (since Switch 3 was initially off and when he approached all three were on), H (from(v)), L, J (from(iv)) or R (since he must have been the second person to operate Switch 3). Therefore, the first person in the queue will be A.

From (v), S is immediately in front of H. H cannot be in the last place because one more person operated Switch 1 after S. H cannot be in the sixth place as well because the person in the 7<sup>th</sup> place did not operate Switch 1 (from(vi)).

If S and H are in fourth and fifth places respectively, L and J cannot be in sixth and seventh because L and H, who flipped the same switch, will then be adjacent violating condition (iii). L and J will be only in second and third positions. K can only be in sixth position. However, after H flipped off switch 2, Switch 3 would still be on. Hence, when K approached the switchboard, one switch would have been on which violates condition (i). Hence, S and H cannot be in fourth and fifth places.

If S and H are in third and fourth places, L and J can only be in sixth and seventh places. K cannot be after H because all three switches would not be on if he was immediately after H. K can be in the second place only, i.e., immediately in front of S. From (ii), when S approached the switchboard, all three switches were on. However, when K approached the board, all three were off. This can only be possible if K flipped on all the three switches. Hence, this case is also not possible.

If S and H are in the second and third places, A must have flipped on Switch 3 (since Switch 3 was initially off and when S approached, all three switches were on). L and J can be in sixth and seventh or in fifth and sixth. If L and J are in fifth and sixth, K cannot be next to H (since one switch will be on when K approaches) and K cannot be last. Hence, L and J will be in sixth and seventh, K will be in fifth and R will be fourth. R flipped off switch 3. L operated switch 2 and J must have operated switch 3 (switch 1 and switch 3 are not possible because of (vi) and (iii) respectively). Hence, K must have operated switch 1.

The following table gives the order in which the seven persons approached the switchboard and the positions of the switches before and after each person flipped a switch (1 represents on and 0 represents off):

Order	1	2	3	4	5	6	7
Person	Alex	Stan	Hugh	Robert	Kenny	Lennox	Jack
Switch Operated	3	1	2	3	1	2	3
Initial Position (Switch 1-2-3)	1-1-0	1-1-1	0-1-1	0-0-1	0-0-0	1-0-0	1-1-0
Final Position (Switch 1-2-3)	1-1-1	0-1-1	0-0-1	0-0-0	1-0-0	1-1-0	1-1-1

8. After Alex flipped a switch, all the three switches were on.  
Choice (D)
9. After Robert flipped a switch, all the three switches were off.  
Choice (B)
10. The initial positions of the three switches were On-On-Off.  
Choice (C)
11. Kenny flipped Switch 1.  
Choice (A)

#### Solutions for questions 12 to 14:

Given that Farhan ate the highest number of rasgullas and that none of the students ate five rasgullas (since the cook estimated that each student will eat five rasgullas and none of them ate the exact number of rasgullas estimated by the cook). The number of rasgullas that the students ate have to be 1, 2, 3, 4, 6, 7, 8, 9. No other combination is possible.

Hence, Farhan ate 9 rasgullas. From ii, Balu ate two rasgullas.

From (iv), Ehsaan and Gautam ate either 4 and 6 rasgullas or 3 and 7 rasgullas.

If they ate 3 and 7 rasgullas, Amar cannot eat one rasgulla more than Dev. Hence, this case is not possible.

If they ate 4 and 6 rasgullas, Amar could eat 8 rasgullas while Dev could eat 7 rasgullas. This is the only possible case.

Hence, the number of rasgullas that each of them ate is as follows.

Hari/Chitrak	Balu	Chitrak/Hari	Ehsaan/Gautam	Gautam/Ehsaan	Dev	Amar	Farhan
1	2	3	4	6	7	8	9

12. Amar ate 8 rasgullas. Ans: (8)  $\therefore \frac{x}{y} = \frac{17}{9}$  Choice (B)
13. Ehsaan, Gautam, Amar ate 18 rasgullas.

Ehsaan, Dev, Hari could have eaten a maximum of 16 rasgullas.

Chitrak, Ehsaan, Dev could have eaten a maximum of 16 rasgullas.

Chitrak, Farhan, Hari ate 13 rasgullas.

Hence, Ehsaan, Gautam, and Amar ate the maximum number of rasgullas. Choice (A)

14. Option A: If Ehsaan ate 3 rasgullas more than Chitrak, they could have eaten 1 and 4 rasgullas or 3 and 6 rasgullas.

Option B: If Gautam ate 1 rasgulla more than Hari, Gautam should have eaten 4 rasgullas and Hari should have eaten 3 rasgullas. This will be sufficient to determine the number of rasgullas that each student ate.

Option C: This statement is not sufficient to determine the number of rasgullas that Gautam and Ehsaan ate.

Option D: This is similar to Option C and is not sufficient. Choice (B)

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

#### SECTION – III: QA

#### Solutions for questions 1 to 34:

$$1. \quad 2x - 7y + t = 0 \quad \text{and} \quad 5x - 3y - 2t = 0 \\ \Rightarrow t = 7y - 2x \quad \Rightarrow t = \frac{5x - 3y}{2}$$

Equating t, we get

$$7y - 2x = \frac{5x - 3y}{2} \\ 14y - 4x = 5x - 3y \\ 17y = 9x$$

2. Let the cost price, the selling price and the marked price of the article be denoted by C, C + d and C + 2d respectively.
- Percentage profit =  $\frac{d}{C} \times 100$
- Discount percentage =  $\frac{d}{C + 2d} \times 100$
- Clearly, the percentage profit is more than the percentage discount. Thus, option (A) and option (B) are ruled out
- Markup percentage =  $\frac{2d}{C} \times 100$
- Therefore the mark up percentage is twice the percentage profit. Hence, option (C) is true.

Now the percentage profit when calculated on the selling price =  $\frac{d}{C+d} \times 100$

Now,  $\frac{d}{C+d} \times 100 < \frac{d}{C} \times 100$ . Thus, option (D) is incorrect.

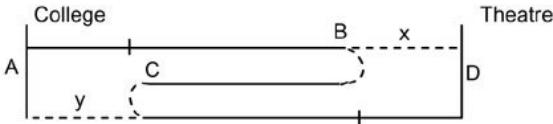
Choice (C)

5. Let the length of the race be  $\ell$  metres and let us consider the distance by which A beats B or that by which B beats C be ' $a$ ' metres  
We get,

$$\begin{aligned}\frac{\ell}{v_A} &= \frac{\ell-a}{v_B} \text{ and } \frac{\ell}{v_B} = \frac{\ell-a}{v_C} \\ \Rightarrow \frac{v_A}{v_B} &= \frac{\ell}{\ell-a} \Rightarrow \frac{v_C}{v_B} = \frac{\ell-a}{\ell} \\ \therefore \frac{v_A \times v_C}{v_B} &= \frac{\ell}{\ell-a} \times \frac{\ell-a}{\ell} \\ \therefore v_A \times v_C &= (v_B)^2 \Rightarrow v_B = \sqrt{v_A v_C}\end{aligned}$$

Thus, the speed of B is the G.M of the speeds of A and C  
Choice (C)

6.



Let the distance covered by each of Arif and Chetan on foot be  $x$  and  $y$  respectively.

In the time Chetan covered  $y$ , Bill with five times his speed must have covered  $5y$ .

$$\therefore AB + BC = 5y \Rightarrow BC = 2y$$

Similarly for Arif,  $BD = x$  and  $BC = 2x \Rightarrow x = y$

Now, total distance from A to D =  $4x = 22.5$  Km

$$\therefore \text{The bike covered } AB + BC + CD = 3x + 2x + 3x = 8x = 45 \text{ Km.}$$

To cover 45 Km, it took  $\frac{45}{30} = 1.5$  hrs or 90 minutes.

Ans: (90)

7. Let the length of N be 3 times the length of M after  $t$  hours.

Considering the initial length of both the candles to be L

$$\text{Length of N remaining after } t \text{ hours} = L - \frac{L}{10}t$$

$$\text{Length of M remaining after } t \text{ hours} = L - \frac{L}{6}t$$

$$L - \frac{Lt}{10} = 3(L - \frac{Lt}{6})$$

$$\Rightarrow \frac{3}{6}LT - \frac{Lt}{10} = 2L$$

$$\Rightarrow \frac{3}{6}t - \frac{t}{10} = 2$$

$$\Rightarrow t = 5 \text{ hrs} = 300 \text{ minutes.}$$

Choice (C)

8. Let the cost price per ml of milk be ₹1

CP of 1000ml = ₹1000

Let the quantity of water added to each 1000 ml of milk be U ml.

Now he sells (1000 + U) at ₹  $\frac{4}{3}$  per ml to get ₹1400

$$(1000+U) \cdot \frac{4}{3} = 1400$$

$$\Rightarrow 4000 + 4U = 4200$$

$$\Rightarrow U = 50$$

Ans: (50)

9. We need to check the highest power of 12 (i.e.,  $2^2 \times 3$ ) in 50!.

Highest power of 2 in 50!

$$\begin{aligned}&= \left[ \frac{50}{2} \right] + \left[ \frac{50}{2^2} \right] + \left[ \frac{50}{2^3} \right] + \left[ \frac{50}{2^4} \right] + \left[ \frac{50}{2^5} \right] \\&= 25 + 12 + 6 + 3 + 1 = 47 \text{ 2's.}\end{aligned}$$

$$\begin{aligned}\text{Highest power of 3 in } 50! &= \left[ \frac{50}{3} \right] + \left[ \frac{50}{3^2} \right] + \left[ \frac{50}{3^3} \right] \\&= 16 + 5 + 1 = 22\end{aligned}$$

Now,  $12 = 4 \times 3$

50! has 47 2's i.e., 23 4's

Now 22 3's with 22 4's will give 22 12's  
Therefore the highest power of 12 in 50! is 22.

Thus, the minimum value of k for which  $\frac{50!}{12^k}$  is not an integer is 23.  
Ans: (23)

10.  $(abcde)_8 = 8^4a + 8^3b + 8^2c + 8d + e$   
 $= 4095a + 511b + 63c + 7d + a + b + c + d + e$

For the above number to be divisible by 7,  
( $a + b + c + d + e$ ) must be divisible by 7.

Of the given options, only  $(36453)_8$  is divisible by 7.

Note: In general for any number in base 'n' to be divisible by  $(n-1)$ , the sum of the digits must be divisible by  $(n-1)$ .  
Choice (D)

11. Let the length, breadth and height of the room be denoted by  $l$ ,  $b$  and  $h$  respectively.

Original volume of the room =  $lhb$ .

New volume of the room

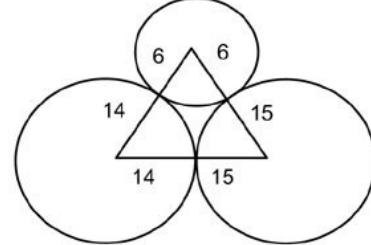
$$= \left( \frac{4}{5}l \right) \left( \frac{3}{4}b \right) \times (\text{new height})$$

$$\text{It is given that } \left( \frac{4}{5}l \right) \left( \frac{3}{4}b \right) \times (\text{new height}) = lhb$$

$$\Rightarrow \text{new height} = \frac{5}{3}h = h + 66\frac{2}{3}\%h$$

$\therefore$  The height of the room needs to be increased by  $66\frac{2}{3}\%$   
Choice (B)

12.



Therefore the sides of the triangle so formed measures 20, 21 and 29 respectively.

We observe that,  $20^2 + 21^2 = 29^2$

It is a right angled triangle whose area

$$= \frac{1}{2}(20)(21) = 210 \text{ sq.cm}$$

**Alternative Solution:**

The sides of the triangle are  $(6 + 14)$ ,  $(6 + 15)$  and  $(14 + 15)$ . i.e., 20, 21 and 29.

$$\text{Now, } s = \text{semi perimeter} = \frac{20+21+29}{2} = 35$$

$$\Rightarrow \text{Area} = \sqrt{35(35-20)(35-21)(35-29)}$$

$$= 210 \text{ sq. cm}$$

Ans: (210)

13. The equations of the lines are as follows.

$$5x + 12y + 21 = 0$$

$$5x + 12y + 99 = 0$$

The distance between them is  $\frac{|99 - 21|}{\sqrt{5^2 + 12^2}} = \frac{78}{13} = 6$   
Choice (B)

14. In an Arithmetic Progression, if the sum of the first  $n$  terms is zero, then each of the first  $\frac{n}{2}$  terms

$\left( \text{or } \frac{n-1}{2} \text{ terms, if } n \text{ is odd} \right)$  will cancel each of the

remaining  $\frac{n}{2}$  terms  $\left( \text{or } \frac{n-1}{2} \text{ terms, if } n \text{ is odd} \right)$

For Eg.  $3, 1, -1, -3$  or  
 $4, 2, 0, -2, -4$

In the above mentioned cases, any two terms equidistant from the midpoint of the series will be equal in magnitude but opposite in sign.

We know that  $T_1 + T_2 + \dots + T_{53} = T_1 + T_2 + \dots + T_{54} + T_{55} + \dots + T_{119}$   
 $\Rightarrow T_{54} + T_{55} + \dots + T_{118} + T_{119} = 0$ .

Now, if  $T_{54}$  is equal to  $-x$ , then  $T_{119}$  will be equal to  $x$ . In the above series, if we add  $T_{53}$  and  $T_{120}$  on either side it will still be 0. Similarly, if we remove  $T_{54}$  and  $T_{119}$  from either side, the sum will still be 0. (Terms symmetric about the middle term)

Now, if we remove 16 terms from either side, we get

$$T_{70} + \dots + T_{103} = 0.$$

$$\Rightarrow T_1 + T_2 + T_3 + \dots + T_{69} = T_1 + T_2 + \dots + T_{69} + T_{70} + T_{71} + \dots + T_{103}$$

$$S_{69} = S_{103}.$$

Therefore the required ratio is 1.

Choice (A)

15.  $p = \log_c ab$

$$\therefore p + 1 = \log_c ab + \log_c c = \log_c abc$$

Similarly  $q + 1 = \log_b abc$  and  $r + 1 = \log_a abc$

$$\begin{aligned} \therefore \frac{1}{p+1} + \frac{1}{q+1} + \frac{1}{r+1} &= \frac{1}{\log_c abc} + \frac{1}{\log_a abc} + \frac{1}{\log_b abc} \\ &= \log_{abc} a + \log_{abc} b + \log_{abc} c \\ &= \log_{abc} abc = 1 \end{aligned}$$

**Alternative Solution:**

Let  $a = b = c$  (positive and not equal to 1), then  $p = q = r = 2$  and the required expression equals 1.

Choice (A)

16. 4 male players and 4 female players can be chosen in  $6C_4 \times 6C_4$  i.e., 225 ways.

Now, we have 4 female players. We need to pair them with the male players. The first female player can be paired in 4 ways, the second in 3 ways, the third in 2 ways and the fourth in 1 way.

Therefore, the total number of selections

$$= 225 \times 4! = 5400$$

Choice (C)

17. The odds in favour of A being selected is 2 : 1

$\therefore$  the probability of A being selected,  $p(A) = \frac{2}{3}$  and the

probability of A being rejected,  $p(\bar{A}) = \frac{1}{3}$

The odds against B being selected = 2 : 3

$\therefore$  the probability of B being rejected,  $p(\bar{B}) = \frac{2}{5}$  and the

probability of B being selected  $p(B) = \frac{3}{5}$

The probability that exactly one person is selected in the interview,

$$P(E) = P(A) P(\bar{B}) + P(\bar{A}) P(B)$$

$$= \left( \frac{2}{3} \times \frac{2}{5} \right) + \left( \frac{1}{3} \times \frac{3}{5} \right) = \frac{7}{15}$$

Choice (B)

18.

f(x)	1	2	3	4
x	1	2	3	4

The difference between consecutive values of  $f(x)$  is a constant.

$f(x)$  difference  $\underbrace{1}_{1} \quad \underbrace{1}_{1} \quad \underbrace{3}_{1} \quad \underbrace{1}_{1}$

this would be true, if  $f(x)$  is of the linear form  
for eg. If  $f(x) = ax + b$

$$\begin{aligned} f(1) &= a + b & \text{Difference} \\ f(2) &= 2a + b & a \\ f(3) &= 3a + b & a \end{aligned}$$

It is given that  $f(x)$  is a polynomial of degree four. So  $f(x)$  must be of such a form that for these values it takes a linear form

$$f(x) = K(x-1)(x-2)(x-3)(x-4) + ax + b$$

$$f(1) = a + b = 1$$

$$f(2) = 2a + b = 2$$

solving, we get,  $a = 1$  and  $b = 0$

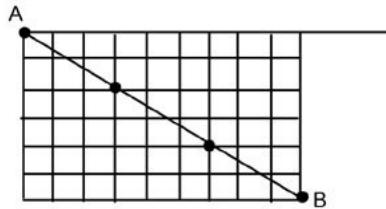
$$f(0) = K(24) = 24$$

$$\therefore K = 1$$

$$\therefore f(5) = (5-1)(5-2)(5-3)(5-4) + 5 = 29$$

Ans: (29)

19. In a grid of  $m$  parallel lines intersecting  $n$  parallel lines, the diagonal will intersect each of the  $(m+n)$  lines once. However, whenever the  $i^{th}$  line and  $j^{th}$  line intersect, for  $\frac{i-1}{j-1} = \frac{m-1}{n-1}$ , the diagonal will intersect them at a common point. These instances need to be subtracted from  $(m+n)$ .



Consider the above illustration:

Let us draw 10 lines parallel to  $y$  axis and 7 lines parallel to  $x$  axis, such that now row wise we have 9 cells and column wise we have 6 cells. The diagonal line will intersect every vertical line and every horizontal line once except a few points where two lines in the grid intersect. In the above case we get 10 + 7 - 4 points. We subtract 4 for  $\frac{9}{6} = \frac{6}{4} = \frac{3}{2}$  i.e., the grid formed by taking  $m$  cells

row wise and  $n$  cells column wise, where  $\frac{m}{n} = \frac{3}{2}$ , in

addition to the point A.

In the given grid we will have  $(21 + 31 - 11) = 41$  points

$$\left[ \frac{30}{20} = \frac{27}{18} = \frac{24}{16} = \frac{21}{14} = \frac{18}{12} = \frac{15}{10} = \frac{12}{8} = \frac{9}{6} = \frac{6}{4} = \frac{3}{2} \right]$$

Hence we get 10 points in addition to point A.  
Ans: (41)

20. The number of proper subsets of a set comprising  $n$  elements is  $2^n - 1$

Let us consider that the two sets A and B have 'a' elements and 'b' elements respectively.

It is given that,

$$(2^a - 1) - (2^b - 1) = 496$$

$$2^a - 2^b = 496 = 2^4(31) = 2^4(32 - 1)$$

$$\therefore 2^a - 2^b = 2^9 - 2^4 = 496$$

$$\therefore a = 9 \text{ and } b = 4.$$

$$\text{Now } n(A \cup B) = 9 + 4 = 13 \text{ (since } n(A \cap B) = 0\text{)}$$

$$\therefore \text{Number of proper subsets of } A \cup B = 2^{13} - 1 = 8191.$$

Ans: (8191)

21.

$$T_n = \frac{6n}{n^4+n^2+1} = 3 \left[ \frac{2n}{n^4+n^2+1} \right] = 3 \left[ \frac{1}{n^2-n+1} - \frac{1}{n^2+n+1} \right]$$

$$\therefore S_{28} = 3 \left[ \left( \frac{1}{1^2-1+1} - \frac{1}{1^2+1+1} \right) + \left( \frac{1}{2^2-2+1} - \frac{1}{2^2+2+1} \right) + \left( \frac{1}{3^2-3+1} - \frac{1}{3^2+3+1} \right) \right. \\ \left. + \dots + \left( \frac{1}{28^2-28+1} - \frac{1}{28^2+28+1} \right) \right]$$

$$\therefore \text{Now } n^2 + n + 1 = (n+1)^2 - (n+1) + 1$$

$$\therefore \frac{1}{1^2+1+1} = \frac{1}{2^2-2+1}$$

$$\text{and } \frac{1}{2^2+2+1} = \frac{1}{3^2-3+1} \text{ and so on}$$

$$= 3 \left[ \frac{1}{1} - \frac{1}{28^2+28+1} \right]$$

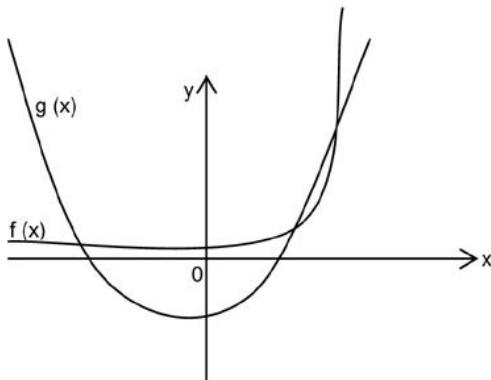
$$= 3 \left[ 1 - \frac{1}{813} \right]$$

$$= 3 \left[ \frac{812}{813} \right] = \frac{812}{271}$$

$$= \frac{270}{271}$$

Choice (B)

22. Let  $e^x = f(x)$  and  $6x^2 - 5x + 6 = g(x)$



$$6x^2 + 5x - 6 = 0$$

$$\Rightarrow (2x+3)(3x-2) = 0$$

$$\Rightarrow x = -\frac{3}{2} \text{ or } x = \frac{2}{3}$$

Let us find the value of  $f(x)$  and  $g(x)$  at different values of  $x$ .

$x$	-2	0	1	6
$f(x)$	0.14	1	2.7	387
$g(x)$	8	-6	5	240

At  $x = -2 f(x) < g(x)$

At  $x = 0 f(x) > g(x)$

Therefore there is one point of intersection between  $x = -2$  and  $x = 0$

Similarly at  $x = 1 f(x) < g(x)$

Therefore there is another point of intersection between  $x = 0$  and  $x = 1$

Similarly at  $x = 6 f(x) > g(x)$

∴ There is a third point of intersection between  $x = 1$  and  $x = 6$ .

From the graph, we can conclude, there will not be any other point of intersection of  $f(x)$  and  $g(x)$  (since the exponential curve increased more steeply than the quadratic). Thus there are exactly three points of intersection.

Choice (D)

23. If there are  $n$  terms in AP with common difference  $d$ , then

$$\text{their standard deviation } \sigma = |d| \frac{\sqrt{n^2 - 1}}{12}$$

$$\text{For the given set, } \sigma = \left| 4\sqrt{2} \right| \frac{\sqrt{7^2 - 1}}{12} \\ = 8\sqrt{2}.$$

As the terms are in AP, their median is the middle most term, i.e.,  $16\sqrt{2}$ .

Therefore the median is twice the standard deviation.

#### Alternative Solution:

Since the ratio of median to standard deviation is required, we can work with only the ratio of the elements in the set, i.e., 1, 2, 3, 4, 5, 6, 7 with a mean of 4 (by dividing each term with  $4\sqrt{2}$ ). Now, SD of the new set

$$= \sqrt{\frac{(3^2+2^2+1^2+0^2+1^2+2^2+3^2)}{7}} = 2$$

And median = 4. Hence, median =  $2 \times \text{SD}$ .

Ans: (2)

24. It is given that  $a \phi b = a \psi b$

$$ab(a-b) = (b-a)^2$$

$$\Rightarrow ab(a-b) = (a-b)^2$$

$$(a-b)(ab-a+b) = 0$$

$$\text{Since } a \neq b, ab-a+b = 0$$

$$(a+1)(b-1) = -1$$

Two cases are possible.

$$1. \quad a+1 = 1 \text{ and } b-1 = -1$$

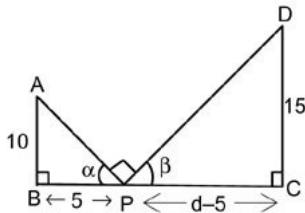
$$2. \quad a+1 = -1 \text{ and } b-1 = 1.$$

Only the second case is possible (since  $a$  and  $b$  will not be distinct in the first case).

$$\text{Hence, } a = -2 \text{ and } b = 2 \Rightarrow a^3 + b^2 = -4$$

Ans: (-4)

25.

Let  $\angle APB = \alpha$ , $\angle DPC = \beta$  and the distance between B and C be  $d$ .  
Now, we know that  $\alpha + \beta = 90^\circ$  and  $BP = 5$ .

In  $\triangle ABP$ ,  $\tan \alpha = \frac{10}{5}$

In  $\triangle DCP$ ,  $\tan \beta = \frac{15}{d-5}$

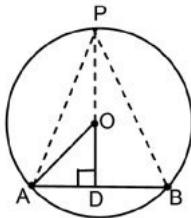
$\tan \beta = \tan (90 - \alpha) = \cot \alpha$

$(\tan \alpha)(\tan \beta) = \left(\frac{10}{5}\right)\left(\frac{15}{d-5}\right) = 1 \quad [\because (\tan \alpha)(\tan \beta) = 1]$

$\Rightarrow d = 35.$

Choice (C)

26. As the area of  $\triangle PAB$  is maximum, we can conclude that P is farthest from the line joining A and B and lies on the perpendicular to AB through O (the centre). Hence,  $\triangle PAB$  is an isosceles triangle.



The distance between AB =  $\sqrt{(5-4)^2 + (5+2)^2} = \sqrt{50}.$

The perpendicular distance of the centre of the circle from the line AB

$= \sqrt{OA^2 - \left(\frac{AB}{2}\right)^2} = \sqrt{5^2 - \left(\frac{\sqrt{50}}{2}\right)^2} = \frac{5}{\sqrt{2}}.$

The height of the triangle PAB = PO + OD

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

Area of the triangle PAB

$= \frac{1}{2} (AB) (PD)$

$= \frac{1}{2} (\sqrt{50}) \left[ \frac{5(\sqrt{2} + 1)}{\sqrt{2}} \right] = \frac{25}{2} (\sqrt{2} + 1)$

Choice (B)

27. It is given that  $a + b + c = 2(d + e)$   
Adding  $(d + e)$  to both sides, we get  
 $a + b + c + d + e = 3(d + e)$  [The number is divisible by 3]  
Again  $a + b + d = 3(c + e)$   
Adding  $(c + e)$  to both sides, we get  
 $a + b + c + d + e = 4(c + e)$  [The number is divisible by 4]  
Therefore the number is divisible by 3 as well as by 4.  
Hence it is divisible by 12.

As the digits are distinct, the maximum possible sum is  $9 + 8 + 7 + 6 + 5 = 35.$ Also, since the digits are non-zero,  $a + b + c + d + e$  is a minimum of  $1 + 2 + 3 + 4 + 5 = 15.$ 

Therefore the sum of the digits of the 4 digit number is 24. [Multiple of 12 in the given range].

$4(c + e) = 24$

$\Rightarrow c + e = 6 \quad \text{--- (1)}$

$3(d + e) = 24$

$\Rightarrow d + e = 8 \quad \text{--- (2)}$

From equation (1) & (2),  $d - c = 2$

Again  $b + d = a + c + e = 12 \Rightarrow a = 12 - (c + e) = 6$

Listing out cases for  $c$  and  $e$ , we get (and using  $d = c + 2$  and  $b = 12 - d$ )

$a$	$b$	$c$	$d$	$e$
6	9	1	3	5 ✓
6	8	2	4	4 ✗
6	7	3	5	3 ✗
6	6	4	6	2 ✗
6	5	5	7	1 ✗

As the digits are distinct, the only possible value of  $abcde$  is 69135.  
Ans: (1)

28. As  $a : b : c = 2 : 3 : 4$ , let us consider  $a, b$  and  $c$  as  $2x, 3x$  and  $4x$  respectively.

Similarly as  $b : d : e = 2 : 3 : 5$ ,Let us consider  $b, d$  and  $e$  as  $2y, 3y$  and  $5y$  respectively.

$\therefore b = 3x = 2y = 6k$  (say)

$\Rightarrow y = 3k$

$\therefore d = 9k$  and  $e = 15k$ .

Thus the sum of  $d$  and  $e$  is  $24k$ .The minimum possible sum of  $d$  and  $e$  is 24 (for  $k = 1$ )  
Choice (C)

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