

Solutions of Mock CAT – 3 2017

Scorecard (proreview.jsp? qsetId=x1BiWc6Rozo=&qsetName=Mock CAT – 3 2017)	Accuracy (AccSelectGraph.jsp? qsetId=x1BiWc6Rozo=&qsetName=Mock CAT – 3 2017)	Time Analysis (TimeAnalysis.jsp? qsetId=x1BiWc6Rozo=&qsetName=Mock CAT – 3 2017)	Qs Analysis (QsAnalysis.js qsetId=x1BiWc6Rozo=&qsetName=Mock CAT – 3 2017)
VRC	DILR		QA

Sec 1

Directions for questions 1 to 6: The passage given below is followed by a set of six questions. Choose the most appropriate answer to each question.

I am always amazed when I hear people say that sport creates goodwill between the nations, and that if only the common people of the world could meet one another at football or cricket, they would have no inclination to meet on the battlefield. Even if one didn't know from concrete examples (the 1936 Olympic Games, for instance) that international sporting contests lead to orgies of hatred, one could deduce it from general principles.

Nearly all the sports practised nowadays are competitive. You play to win, and the game has little meaning unless you do your utmost to win. On the village green, where you pick up sides and no feeling of local patriotism is involved, it is possible to play simply for the fun and exercise: but as soon as the question of prestige arises, as soon as you feel that you and some larger unit will be disgraced if you lose, the most savage combative instincts are aroused. Anyone who has played even in a school football match knows this. At the international level sport is frankly mimic warfare. But the significant thing is not the behaviour of the players but the attitude of the spectators: and, behind the spectators, of the nations who work themselves into furies over these absurd contests, and seriously believe — at any rate for short periods — that running, jumping, and kicking a ball are tests of national virtue.

In England, the obsession with sport is bad enough, but even fiercer passions are aroused in young countries where games playing and nationalism are both recent developments. As soon as strong feelings of rivalry are aroused, the notion of playing the game according to the rules always vanishes. People want to see one side on top and the other side humiliated, and they forget that victory gained through cheating or through the intervention of the crowd is meaningless. Even when the spectators don't intervene physically they try to influence the game by cheering their own side and "rattling" opposing players with boos and insults. Serious sport has nothing to do with fair play. It is bound up with hatred, jealousy, boastfulness, disregard of all rules and sadistic pleasure in witnessing violence.

There cannot be much doubt that the whole thing is bound up with the rise of nationalism — that is, with the lunatic modern habit of identifying oneself with large power units and seeing everything in terms of competitive prestige. Also, organised games are more likely to flourish in urban communities where the average human being lives a sedentary or at least a confined life, and does not get much opportunity for creative labour. In a rustic community, a boy or young man works off a good deal of his surplus energy by walking, swimming, snowballing, climbing trees, riding horses, and by various sports involving cruelty to animals, such as fishing, cock-fighting and ferreting for rats. In a big town one must indulge in group activities if one wants an outlet for one's physical strength or for one's sadistic impulses.

Q.1

What is the thematic highlight of the passage?

- 1 ☐ There exists not much difference between playing international sports and indulging in war with another nation.
- 2 ☐ People are often misled to believe that sport increases harmony.
- 3 ☐ Sport does not necessarily promote harmony between groups and nations as many people mistakenly believe.
- 4 ☐ It is impossible to play for fun as all sports ultimately turn combative.

Solution:

Correct Answer : 3

The author compares sports with war to indicate that sporting events are filled with animosity. This does not mean that sports and war are similar in nature. This eliminates option (1). Option (2) is incorrect as the phrase 'misled to believe' indicates a deliberate action by a person or group. This is not indicated in the passage. The author states that people mistakenly believe that sport induces harmony. This makes option (3) correct. The author mentions that it is possible to play for fun when no feelings of patriotism are involved. Hence, option (4) is also incorrect.

FeedBack

Bookmark

Answer key/Solution

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Q.2

Which of the following would support the author's views in this passage?

- 1 ☐ It is the most violently combative sports such as football and boxing that have spread the widest.
- 2 ☐ Sports paraphernalia like use of war paints and beating drums validates the inherent combative nature of the games.
- 3 ☐ Spectators display strong emotions while their favourite team is playing.
- 4 ☐ Many spectators rush into the field to celebrate alongside their team players.

Solution:

Correct Answer : 1

Option (1) supports the author's views as the author has tried to explain that sport is associated with feelings of animosity and there is an element of combativeness inherent in sport. Use of war paints and beating drums may be used to exhibit feelings of exhilaration or triumph as much as they can be used to exhibit feelings of hatred and animosity. Hence, option (2) does not validate the author's view point. Similarly, strong emotions may not necessarily be negative. This makes option (3) incorrect.

Option (4) is irrelevant as it doesn't support the central idea of the passage.

FeedBack

 Bookmark

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Q.3

Which of the following is true according to the passage?

- 1 ☐ Sport is one of the main causes of international rivalry.
- 2 ☐ The sense of rivalry in sports is another effect of causes that have produced nationalism.

3 ☐ Younger countries are more severely affected by nationalism than older countries like England are.

4 ☐ Rules have no meaning when a combative sport is being played.

Solution:

Correct Answer : 2

Refer to the lines- "with the lunatic modern habit of identifying oneself with large power units and seeing everything in terms of competitive prestige". The author has associated this 'lunatic feeling' with rise of nationalism as well as sports. This makes option (2) correct. Option (1) is incorrect as sport is not the main cause but a contributor to international rivalry. Option (3) is incorrect as the author has said that countries where nationalism is on rise are more severely affected by feelings aroused by sports. This does not mean that older countries are not as severely affected by nationalism. Refer to the lines – "As soon as strong feelings of rivalry are aroused, the notion of playing the game according to the rules always vanishes." This may or may not be true each time a combative sport is being played. This makes option (4) incorrect.

FeedBack

Bookmark

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Q.4

The author of the passage can be characterized as being:

1 ☐ a cynic.

2 ☐ an opinionated writer.

3 ☐ a sports critic.

4 ☐ a sports enthusiast.

Solution:

Correct Answer : 2

The author has expressed strong opinions about the motive behind sports. A sports critic would critique a game or player and not the psyche of playing sports. The author can't be a sport enthusiast as per the information provided in the passage. Similarly, option (1) is too extreme. He can't be called cynical for not supporting sports.

FeedBack

Bookmark

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Q.5

Why do organised games flourish more in the urban communities than they do in the rural setup?

- 1 ☐ In rural communities, sport is played for fun and is often not competitive.
- 2 ☐ In urban communities, there are few options of outlet of surplus energy.
- 3 ☐ Urban life is sedentary and lonely and sport is a way to connect with fellow beings.
- 4 ☐ Games played in urban communities differ from those played in rural communities.

Solution:

Correct Answer : 2

Refer to the lines - "Also, organised games are more likely to flourish in urban communities where the average human being young man works off a good deal of his surplus energy by walking..... involving cruelty to animals, such as fishing, cock-fighting and ferreting for rats." This makes option (2) correct.

 Bookmark

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Q.6

What can be inferred regarding the role of spectators in sports?

- 1 ☐ The behaviour of spectators is the main thing that fuels rivalry among teams.
- 2 ☐ Spectators disregard all rules of conduct if their team is defeated in a national event.
- 3 ☐ Spectators are not central to organised sports and cannot affect the game.

4 ☐ Spectators take the defeat of their team as a personal affront.

Solution:

Correct Answer : 4

The behaviour of the spectators is discussed in the passage but the author has not commented on how this behaviour affects the teams playing. This makes option (1) incorrect. The emotions associated with defeat are discussed but not the behaviour. Also, author has mainly discussed international rivalry. This makes option (2) incorrect. The author states that defeat is associated with shame. This makes option (4) correct.

FeedBack

 Bookmark

 Answer key/Solution

Q.7

The following question consists of a set of five sentences. These sentences need to be arranged in a coherent manner to create a meaningful paragraph. Type in the correct order of the sentences in the space provided below the question.

1. They'd slip away from their herds and would lumber across the dusty landscape, like the titans we read about in seventh grade in Greek Mythology.
2. Some people used to believe that there was an elephant graveyard—a place that sick and old elephants would travel to die.
3. Explorers who went in search of the graveyard would follow dying elephants for weeks, only to realize they'd been led in circles.
4. Legend said the spot was in Saudi Arabia; that it was the source of a supernatural force; that it contained a book of spells to bring about world peace.
5. Here's why: The elephant graveyard is a myth.

x

Solution:

Correct Answer : 21435

Your Answer : 12345

21435

 Bookmark

 Answer key/Solution

The paragraph starts with the description of the legend and the belief that some people hold. 'They' in statement 1 refers to the elephants mentioned in statement 2. Statement 4 continues the description of the legend. Statement 3 talks about that the search for this graveyard was futile. Sentence 5 explains why this search was futile. Hence, 21435 is the correct sequence.

FeedBack

Q.8

In this question, five sentences are given. Of these, four sentences can be logically sequenced to make a coherent paragraph. One of the sentences does not belong to the paragraph. Type in the sentence number that doesn't fit into the paragraph.

1. What is surprising and paradigm shifting for me about the Tamil epics discussed above is that these are female journeys —where the quest for justice and the transformation of the female heroines changes a society.
2. For too long, we have been blinded by the popular versions of the epics that have merged with television soaps to give us a spicy version of history.
3. We tend to think of epics as male narratives, a story that relates the journey and transformation of a male hero — the epics of the western canon, such as the Iliad and Odyssey.
4. What is even more intriguing is that these epics are written by men.
5. For me, it was a revelation to come across epics such as Silappadikaram and Manimekalai.

Solution:

Correct Answer : 2

The correct sequence is 5314. 5 opens the discussion by mentioning the epics "discussed above". 3 talks about how traditionally popular epics are about male heroes. 1 contrasts it with the presently discussed epics being about female heroes. The words 'surprising and paradigm shifting' in 1 are contrasted against 'even more intriguing' in 4. Hence, 2 is the odd one out.

FeedBack

 Bookmark

 Answer key/Solution

Directions for questions 9 to 14: The passage given below is followed by a set of six questions. Choose the most appropriate answer to each question.

The world's oceans are faced with an unprecedented loss of species comparable to the great mass extinctions of prehistory, a major report suggests today. The seas are degenerating far faster than anyone has predicted, the report says, because of the cumulative impact of several severe individual stresses, ranging from climate warming and sea-water acidification, to widespread chemical pollution and gross overfishing. The coming together of these factors is now threatening the marine environment with a catastrophe "unprecedented in human history", according to the report, from a panel of leading marine scientists brought together in Oxford earlier this year by the International Programme on the State of the Ocean (IPSO) and the International Union for the Conservation of Nature (IUCN).

The stark suggestion made by the panel is that the potential extinction of species, from large fish at one end of the scale to tiny corals at the other, is directly comparable to the five great mass extinctions in the geological record, during each of which much of the world's life died out. They range from the Ordovician-Silurian "event" of 450 million years ago, to the Cretaceous-Tertiary extinction of 65 million years ago, which is believed to have wiped out the dinosaurs. The worst of them, the event at the end of the Permian period, 251 million years ago, is thought to have eliminated 70 per cent of species on land and 96 per cent of all species in the sea.

The panel of 27 scientists, who considered the latest research from all areas of marine science, concluded that a "combination of stressors is creating the conditions associated with every previous major extinction of species in Earth's history". "The findings are shocking," said Dr Alex Rogers, professor of conservation biology at Oxford University and IPSO's scientific director. "As we considered the cumulative effect of what humankind does to the oceans, the implications became far worse than we had individually realised.

Not only are there severe declines in many fish species, to the point of commercial extinction in some cases, and an "unparalleled" rate of regional extinction of some habitat types, such as mangrove and seagrass meadows, but some whole marine ecosystems, such as coral reefs, may be gone within a generation. The report says: "Increasing hypoxia [low oxygen levels] and anoxia [absence of oxygen, known as ocean dead zones], combined with warming of the ocean and acidification, are the three factors which have been present in every mass extinction event in Earth's history.

"There is strong scientific evidence that these three factors are combining in the ocean again, exacerbated by multiple severe stressors. The scientific panel concluded that a new extinction event was inevitable if the current trajectory of damage continues." The panel pointed to several indicators showing how serious the situation is. It said, for example, that a single mass coral bleaching event in 1998 killed 16 per cent of all the world's coral reefs, and pointed out that overfishing has reduced some commercial fish stocks and populations of "bycatch" (unintentionally caught) species by more than 90 per cent. It disclosed that new scientific research suggests that pollutants, including flame-retardant chemicals and synthetic musk found in detergents, are being traced in the polar seas, and that these chemicals can be absorbed by tiny plastic particles in the ocean which are in turn ingested by marine creatures such as bottom-feeding fish.

Plastic particles also assist the transport of algae from place to place, increasing the occurrence of toxic algal blooms – which are also caused by the influx of nutrient-rich pollution from agricultural land. The experts agreed that when these and other threats are added together, the ocean and the ecosystems within it are unable to recover, being constantly bombarded with multiple attacks. The report sets out a series of recommendations and calls on states, regional bodies, and the United Nations to enact measures that would better conserve ocean ecosystems, and demands the urgent adoption of better governance of the largely unprotected high seas.

Q.9

Why are the seas degenerating faster than what was predicted?

- 1 ☐ The seas are facing an environmental hazard like the one that destroyed dinosaurs.
- 2 ☐ Plastic particles have increased the occurrence of toxicity in water bodies.
- 3 ☐ The governments of various nations have failed to come together to reduce water pollution.
- 4 ☐ The individual degenerative factors have added up to create the present situation.



Solution:

Correct Answer : 4

Your Answer : 4

Refer to the lines- "...The seas are degenerating far faster than anyone has predicted, the report says, because of the cumulative impact of a number of severe individual stresses..." This makes option (4) correct. Option (1) is also correct according to the passage but it does not answer the question asked. It is true that oceans today are facing a hazard like the one that destroyed dinosaurs but this does not answer why the oceans are facing this hazard.

FeedBack

Bookmark

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Q.10

Which of the following factors are responsible for reducing species of marine life?

- 1 ☐ Fishing and dumping of human waste in the seas.
- 2 ☐ Low levels of oxygen and over-fishing.
- 3 ☐ Increased toxicity and increasing demands of clean water.
- 4 ☐ Increased demands of clean water and rising sea temperatures.



Solution:

Correct Answer : 2

Your Answer : 2

'dumping of human waste' and 'increasing demands of clean water' have not been mentioned in the passage. This makes options (1), (3) and (4) incorrect.

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The world's oceans are faced with an unprecedented loss of species comparable to the great mass extinctions of prehistory, a major report suggests today. The seas are degenerating far faster than anyone has predicted, the report says, because of the cumulative impact of several severe individual stresses, ranging from climate warming and sea-water acidification, to widespread chemical pollution and gross overfishing. The coming together of these factors is now threatening the marine environment with a catastrophe "unprecedented in human history", according to the report, from a panel of leading marine scientists brought together in Oxford earlier this year by the International Programme on the State of the Ocean (IPSO) and the International Union for the Conservation of Nature (IUCN).

The stark suggestion made by the panel is that the potential extinction of species, from large fish at one end of the scale to tiny corals at the other, is directly comparable to the five great mass extinctions in the geological record, during each of which much of the world's life died out. They range from the Ordovician-Silurian "event" of 450 million years ago, to the Cretaceous-Tertiary extinction of 65 million years ago, which is believed to have wiped out the dinosaurs. The worst of them, the event at the end of the Permian period, 251 million years ago, is thought to have eliminated 70 per cent of species on land and 96 per cent of all species in the sea.

The panel of 27 scientists, who considered the latest research from all areas of marine science, concluded that a "combination of stressors is creating the conditions associated with every previous major extinction of species in Earth's history". "The findings are shocking," said Dr Alex Rogers, professor of conservation biology at Oxford University and IPSO's scientific director. "As we considered the cumulative effect of what humankind does to the oceans, the implications became far worse than we had individually realised.

Not only are there severe declines in many fish species, to the point of commercial extinction in some cases, and an "unparalleled" rate of regional extinction of some habitat types, such as mangrove and seagrass meadows, but some whole marine ecosystems, such as coral reefs, may be gone within a generation. The report says: "Increasing hypoxia [low oxygen levels] and anoxia [absence of oxygen, known as ocean dead zones], combined with warming of the ocean and acidification, are the three factors which have been present in every mass extinction event in Earth's history.

"There is strong scientific evidence that these three factors are combining in the ocean again, exacerbated by multiple severe stressors. The scientific panel concluded that a new extinction event was inevitable if the current trajectory of damage continues." The panel pointed to several indicators showing how serious the situation is. It said, for example, that a single mass coral bleaching event in 1998 killed 16 per cent of all the world's coral reefs, and pointed out that overfishing has reduced some commercial fish stocks and populations of "bycatch" (unintentionally caught) species by more than 90 per cent. It disclosed that new scientific research suggests that pollutants, including flame-retardant chemicals and synthetic musk found in detergents, are being traced in the polar seas, and that these chemicals can be absorbed by tiny plastic particles in the ocean which are in turn ingested by marine creatures such as bottom-feeding fish.

Plastic particles also assist the transport of algae from place to place, increasing the occurrence of toxic algal blooms – which are also caused by the influx of nutrient-rich pollution from agricultural land. The experts agreed that when these and other threats are added together, the ocean and the ecosystems within it are unable to recover, being constantly bombarded with multiple attacks. The report sets out a series of recommendations and calls on states,

regional bodies, and the United Nations to enact measures that would better conserve ocean ecosystems, and demands the urgent adoption of better governance of the largely unprotected high seas.

Q.11

Why are the factors now threatening the marine environment being called catastrophic?

- 1 ☐ They are the same factors that were present in the previous mass destructions that wiped off many species.
- 2 ☐ They are affecting the oceans and are, hence, under the radar of world agencies.
- 3 ☐ They are wiping off species and leading to a destruction that is unprecedented in history.
- 4 ☐ We are not prepared to face the level of destruction they can unleash.



Solution:

Correct Answer : 3

Your Answer : 1

Option (1) is correct according to the passage but it only states that the factors are the same that were present in earlier mass destructions. This may or may not be threatening in the present circumstances. The factors may be the same but they might be working against different environment and times. This makes option (1) insufficient to answer the question asked. Option (3) answers as to why these factors are threatening and hence is the correct answer. Option (2) is incorrect as the radar of world agencies is not mentioned in this context. Option (4) is irrelevant to the passage.

FeedBack

Bookmark

Answer key/Solution

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Q.12

How is the presence of detergent in water affecting marine life?

- 1 ☐ Detergent increases toxicity as it is a chemical compound.
- 2 ☐ Detergent combined with plastic is ingested by marine creatures.

3 ☐ Detergent combines itself with plastic particles and creates toxins.

4 ☐ Detergent combined with plastic helps in the movement of algae.



Solution:

Correct Answer : 2

Your Answer : 2

Refer to the line- "...including flame-retardant chemicals and synthetic musk found in detergents....which are in turn ingested by marine creatures such as bottom-feeding fish." Thus, option (2) is the correct answer.

Bookmark

Answer key/Solution

FeedBack

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Q.13

Why has the author used the example of coral bleaching?

1 ☐ To explain how corals were mass destroyed in the year 1998.

2 ☐ To elaborate on the potential hazard of polluting factors present today.

3 ☐ To sensitize us towards environment and its protection.

4 ☐ To exemplify the effects of human actions that lead to destruction.



Solution:

Correct Answer : 2

Your Answer : 2

The author uses the example of corals to explain that the factors present today need to be taken seriously as a single mass destructive event can lead to a significant percentage of the species to be destroyed. This makes option (2) correct. Option (1) is incorrect as the author is not explaining the event of 1998 but is taking it as an example. Option (3) and (4) are too broad to

Bookmark

Answer key/Solution

answer the question.

FeedBack

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Q.14

The tone of the passage is:

1 ☐ descriptive.

2 ☐ evaluative.

3 ☐ condemning.

4 ☐ hortatory.

Solution:

Correct Answer : 1

The author has not compared or evaluated any data. He has mentioned other researches, findings and has merely stated the opinion of others. In some parts, he has analyzed and given his opinion. However, the overall tone of this passage can be categorised as being descriptive.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 15 to 17: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

Science advances fastest when data and conclusions are shared as quickly as possible. Yet it is common practice for medical researchers to hoard results for months or years until research is published in an academic journal. Even then, the data underpinning a study are often not made public.

The incentive to withhold findings is powerful. Journal papers are the de facto measure of a scientist's productivity. To win research money and get promoted, scientists need to accrue an impressive list of publications. Yet the delays in disseminating knowledge have the capacity to do real harm: during the Zika crisis, sponsors of research had to persuade publishers to declare that scientists would not be penalised for releasing their findings early. Nor are elite journals the guardians of quality that they often claim to be. The number of papers so flawed that they need to be retracted has risen sharply in the

past two decades. Studies in elite journals (such as Nature and Science) are no more statistically robust than those in lesser journals. Science should not, and need not, be shackled by journal publication. Three sensible reforms would ensure that researchers' results could be communicated to more people more quickly, without any compromise on quality.

Step one is for the organisations that finance research to demand that scientists put their academic papers, along with their experimental data, in publicly accessible "repositories" before they are sent to a journal. That would allow other researchers to make use of the findings without delay. Those opposed to such "preprints" argue that they allow shoddy work to proliferate because it has not yet been peer-reviewed. That may surprise physicists and mathematicians, who have been posting work to arXiv, a preprint repository, for more than 25 years with no ill effects. After peer review, research should also be freely available for all to read. Too much science, much of it paid for from the public purse, languishes behind paywalls.

Step two is to improve the process of peer review itself. Journals currently administer a system of organising anonymous peer reviewers to pass judgment on new research—a fact they use, in part, to justify their hefty subscription prices. But this murky process is prone to abuse. At its worst, cabals of researchers are suspected of guaranteeing favourable reviews for each other's work. Better that reviewers are named and that the reviews themselves are published. The Gates foundation has announced its support for an online repository where such open peer review of papers takes place. The repository was launched last year by the Wellcome Trust, meaning that the world's two largest medical charities have thrown their weight behind it.

Finally, science needs to stop relying so much on journal publication as the only recognised credential for researchers and the only path to career progression. Tools exist that report how often a preprint has been viewed, for example, or whether a clinical data set has been cited in guidelines for doctors. A handful of firms are using artificial intelligence to assess the scientific importance of research, irrespective of how it has been disseminated. Such approaches need encouragement. Journals may lose out, but science itself will benefit.

Q.15

Which of the following is a reason for scientists to withhold research findings?

- 1 ☐ Number of published articles is a measure and tool of success for a scientist.
- 2 ☐ No popular journal will publish findings that have already been declared.
- 3 ☐ Scientists earn money by publishing articles in famous journals.
- 4 ☐ Scientists need peer-reviews to ensure the correctness of their research papers.

Solution:

Correct Answer : 1

The author states that journal papers are the de facto measure of a scientist's productivity. To win research money and get promoted, scientists need to accrue an impressive list of publications. This makes option (1) correct. The other options are not factually supported by the passage.

Bookmark

Answer key/Solution

FeedBack

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Q.16

What is the author's view on the quality of papers published in famous journals??

- 1 ☐ They are worse than papers published elsewhere.
- 2 ☐ They are good by the virtue of being selected for publication by these journals.
- 3 ☐ They are no better than papers published elsewhere.
- 4 ☐ The publishers do not satisfactorily check them.

Solution:

Correct Answer : 3

The author states that the number of papers so flawed that they need to be retracted has risen sharply in the past two decades. Studies in elite journals (such as Nature and Science) are no more statistically robust than those in lesser journals. This makes option (3) correct. Option (4) can be a reason but it doesn't answer the question.

 **Bookmark**

 **Answer key/Solution**

Feedback

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Q.17

Why does the author appreciate the repository launched by the Gates foundation?

- 1 ☐ It allows the findings of the paper to become public much before its actual publication.
- 2 ☐ It is supported by two important medical charities and hence has a lot of credibility.
- 3 ☐ It ensures that reviews are satisfactorily done by publishing the names of the reviewers.
- 4 ☐ The publications in this repository are not motivated by financial or personal gain.

Solution:

Correct Answer : 3

The author states that reviewers often give each other's papers good reviews and it is important that for this abuse to stop that the names of reviewers and the reviews themselves should be published. This makes (3) correct. Option (2) is misleading as it is not the intention of the author. He has used the two charities as examples.

 **Bookmark**

 **Answer key/Solution**

Feedback

Q.18

The following question consists of a set of five sentences. These sentences need to be arranged in a coherent manner to create a meaningful paragraph. Type in the correct order of the sentences in the space provided below the question.

1. "It's common to hear people say, 'ping me' and a majority of them are not aware that it's a network terminology," says PV Bharadwaj, who has been engaged in the development of tech-based products.

2. Computers can carry out a raft of tasks simultaneously, which is where the term comes from.
3. After all, information technology has invaded almost all aspects of our lives and it's only to be expected that the words we speak will partly bear its influence.
4. Similarly, multi-tasking is a term straight out of the IT industry.
5. To the uninitiated ear, terms like 'Control-C-Control-V' and 'raise an incident' may strike a jarring note and even sound unreal but IT terms have invaded the non-IT world and keep rolling off the tongues of people more often than they realise.

Solution:

Correct Answer : 51423
51423

🔖 Bookmark

🔍 Answer key/Solution

Statement 5 starts the description of how IT terms have come into everyday language. Statements 1 and 4 give example of that. 42 is a mandatory pair as both talk about the term "multi-tasking". Sentence 3 gives the reason as to why IT terms have entered our routine vocabulary.

FeedBack

Q.19

The following question consists of a paragraph followed by four summaries. Choose the option that best captures the essence of the paragraph. Type in the option number in the space provided below the question.

Alas for the insensible human heart! Never can it free itself from delusion. Logic is realised very late. Setting aside even the most formidable proof to the contrary, it clings desperately to false hopes. At last one day, ripping the veins and sucking the entire blood it vanishes. When sense returns, it becomes restless to fall into another trap of delusion.

1. The human heart is insensible to such an extent that it is beyond reason and logic.
2. The human heart is insensible and can't understand logic which, in turn, makes it an easy prey to false hopes.
3. The human heart falls into the trap of delusions as it clings to false hopes despite the presence of logical counter-proof.
4. The human heart, in its quest for false hopes, rejects logic and falls into a trap.

Solution:

Correct Answer : 3

The paragraph states that the human heart can't be reasoned with as it clings desperately to false hopes. When one hope is dashed, it rushes into another. Only option (3) captures both the aspects mentioned in the passage. Option (1) is a conclusion and not a summary. Option (2) is wrong because of the phrase "easy prey" as it twists the tone of the paragraph. Option (4) creates a twisted cause-effect relationship. Hence, (3) is the answer.

🔖 Bookmark

🔍 Answer key/Solution

FeedBack

Directions for questions 20 to 25: The passage given below is followed by a set of six questions. Choose the most appropriate answer to each question.

India and Africa have long had a symbiotic and very close relationship. India was consistent in backing freedom movements across the African continent, be it in Algeria or in Kenya. At a time when Nelson Mandela was excoriated and jailed as a criminal on Robben Island in South Africa, it was India which stepped forward to assist the African National Congress and to ensure that it was given representation as an honoured member of the diplomatic colony in New Delhi. Certainly, there have been episodes where dictators in Africa behaved in a reprehensible manner towards those who had settled in their countries from India, the worst example being that of Idi Amin Daddah, the monster who destroyed so much of normal life in Uganda. However, his own people were by far the more numerous victims of the crazed strongman, who was finally removed from power, but who was enabled to escape accountability for his crimes as a consequence of the generosity shown by the Kingdom of Saudi Arabia towards the former dictator. However, in the most developed economy in Africa, South Africa, the Indian community was active in the movement to free the country from control by racists, which is why they have since been given an honoured place in the post-Apartheid era.

Over and over, India and Africa have been on the same page. However, little of such shared history and objectives has found its way into school textbooks in India, which are still obsessed with Europe, and the United Kingdom. Had at least a few of those who roughed up our welcome and valued guests from Africa understood the extent of common history between Africa and India, they may have hesitated before resorting to violence against innocent individuals from a continent destined for greatness in the 21st century.

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Q.20

Why does the author talk about Nelson Mandela and India's involvement with the African National Congress?

- 1 ☐ To show how India has helped the other nations in their time of need.
- 2 ☐ To show that India has always fought against racism and dictatorship.
- 3 ☐ To show that India and Africa have shared goodwill in the past.
- 4 ☐ To show that India and Africa have faced the same kind of problems in the past.



Solution:

Correct Answer : 3

Your Answer : 3

The author has taken examples from history to show that India and Africa have long standing amiable relations. Options (1) and (2) are not about India- Africa relations but about India in general. Option (4), if true, would only explain that India and Africa can empathise with each other but not that they have had an amiable past.

[FeedBack](#)
[Bookmark](#)
[Answer key/Solution](#)

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Q.21

Why does the author excuse the ill treatment of Indians settled in Africa by Idi Amin Daddah?

- 1 ☐ A few incidents of racism should not overshadow the relationship built by India and Africa over the years.
- 2 ☐ Idi Amin Daddah was a dictator who had victimised his own people far more often than he had victimised others.
- 3 ☐ It is because of this victimisation of Indians settled in Africa that India got involved with the African freedom movement.
- 4 ☐ Idi Amin Daddah was a dictator and the people of Africa did not support his policies.



Solution:

Correct Answer : 2

Your Answer : 2

The author tries to explain that Africa is not generally racist against Indians but have also suffered at the hands of dictators like Idi Amin who have been cruel to Indians living in Africa. This makes option (2) correct.

[FeedBack](#)
[Bookmark](#)
[Answer key/Solution](#)

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Q.22

Why does the author talk about school curriculum and textbooks?

- ☐ 1 To explain that people of India are unaware of the shared history between Africa and India.
- ☐ 2 To excuse the behaviour of the people who perpetuated racism against Africans in India.
- ☐ 3 To explain why people in India discriminate against Africans who are living in India.
- ☐ 4 To justify the current state of Indian psyche that is racist and intolerant.

Solution:

Correct Answer : 1

The author talks about school curriculum and textbooks to explain that although Africa and India have shared history, Indians are not actively made aware of it. This makes option (1) correct. This is done to show how Indians are indifferent to this shared history but this does not explain why some Indians are acting against the Africans living in India. This makes option (3) incorrect.

FeedBack

Bookmark

Answer key/Solution

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Q.23

Which one of the following is not an argument made in favour of the abusers involved in the Greater Noida incident?

1 ☐ Africans are responsible for increasing the drug abuse problem in India.2 ☐ Africans disregard the local culture of India while living in India.3 ☐ Africans love loud music that disturbs their neighbours.4 ☐ Africans are solely to be blamed for certain evils in our society.

Solution:

Correct Answer : 2

Your Answer : 2

The author states that those who defend the people responsible for racist acts against Africans in India give arguments that Africans like loud music, they promote use of drugs and that they are responsible for certain evils in our society. This makes option (2) as the right answer.

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Q.24

Why would China and Pakistan be happy to see the growing distance between India and Africa?

1 ☐ Africa is progressing and India can benefit from it.

- ☐ Africa will become one of the greatest nations in the 21st century.
- ☐ Africa will soon leave behind other nations in economic progress.
- ☐ Pakistan and China have some political benefit to gain from the event.

Solution:

Correct Answer : 4

Refer to the lines "For these degenerates have given a diplomatic windfall to Pakistan and China, two countries that will be delighted to see a growing distance between India and Africa." This makes option (4) as the only possible answer.

FeedBack

Bookmark

Answer key/Solution

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Q.25

Which of the following is the main point the author is trying to make in the passage?

- ☐ Acts of racism in India and Africa are not in line with the shared history and goals of these two nations.
- ☐ Many Indians do not understand and respect the ties that have existed between India and Africa.
- ☐ A few acts of racism by unthinking individuals should not be taken to represent the way Africa is viewed by India.
- ☐ Indians need to learn to respect people from other nations and not blame them for India's internal problems.

Solution:

Correct Answer : 3

The author starts by explaining the shared history and amiable past of India and Africa. He states that the act of racism mentioned in this passage is by individuals who are unaware of this past and present amiability and thus this is not the true picture of those relationships. Option (1) is incorrect as it talks about racism in the two countries and not about the attack against Africans in India.

FeedBack

Bookmark

Answer key/Solution

Q.26

The following question consists of a set of five sentences. These sentences need to be arranged in a coherent manner to create a meaningful paragraph. Type in the correct order of the sentences in the space provided below the question.

1. To this end, individuals at the helm of powerful societies are "standing athwart history, yelling Stop".
2. Ours is an age awash in reactionary fever.
3. Words by influential political figures borrow from vocabularies of patriotism to provoke and incite in the name of 'return to greatness'.

4. Many have mistakenly diagnosed this as a rise or a return of conservatism.
5. They promise to halt change, reset the clock, and if need be abolish history itself.

Solution:

Correct Answer : 23154
23154

Bookmark

Answer key/Solution

Statement 2 starts the description of our age. 'to this end' in statement 1 refers to 'return of greatness' in statement 3. Hence, 31 becomes a pair. 'They' in statement 5 refers to 'individuals' in statement 1. 4 introduces a new perspective and hence will come at the end of the paragraph.

FeedBack

Q.27

In this question, five sentences are given. Of these, four sentences can be logically sequenced to make a coherent paragraph. One of the sentences does not belong to the paragraph. Type in the sentence number that doesn't fit into the paragraph.

1. Pageants and ceremonies are not a measure of a civilization's success.
2. In going to America one learns that poverty is not a necessary accompaniment to civilisation.
3. It is, thus, well worth one's while to go to this country which can teach us the beauty of the words freedom and liberty.
4. Here at any rate is a country that has no trappings, no pageants, and no gorgeous ceremonies.
5. I saw only two processions—one was the Fire Brigade preceded by the Police, the other was the Police preceded by the Fire Brigade.

Solution:

Correct Answer : 1

The correct sequence is 2453. 'a country' in 4 refers to 'America' in 2. 4 and 5 make a pair as they describe lack of trappings. 3 gives a conclusion to this paragraph. Hence, 1 is the odd one out.

Bookmark

Answer key/Solution

FeedBack

Directions for questions 28 to 30: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

During the Spanish Civil War, I found myself feeling very strongly that a true history of this war never would or could be written. Accurate figures, objective accounts of what was happening, simply did not exist. And if I felt that even in 1937, when the Spanish Government was still in being, and the lie which the various Republican factions were telling about each other and about the enemy were relatively small ones, how does the case stand now? Even if Franco is overthrown, what kind of records will the future historian have to go upon? And if Franco or anyone at all resembling him remains in power, the history of the war will consist quite largely of "facts" which millions of people now living know to be lies. One of these "facts", for instance, is that there was a considerable Russian army in Spain. There exists the most abundant evidence that there was no such army. Yet if Franco remains in power, and if Fascism in general survives, that Russian army will go into the history books and future school children will believe in it. So, for practical purposes the lie will have become truth.

This kind of thing is happening all the time. Out of the millions of instances which must be available, I will choose one which happens to be verifiable. During part of 1941 and 1942, when the Luftwaffe was busy in Russia, the German radio regaled its home audiences with stories of devastating air raids on London. Now, we are aware that those raids did not happen. But what use would our knowledge be if the Germans conquered Britain? For the purposes of a future historian, did those raids happen, or didn't they? The answer is: If Hitler survives, they happened, and if he falls they didn't happen. Such is the case with innumerable other events of the past ten or twenty years. Is the Protocols of the Elders of Zion a genuine document? Did Trotsky plot with the Nazis? How many German aeroplanes were shot down in the Battle of Britain? Does Europe welcome the New Order? In no case, you get one answer which is universally accepted because it is true: in each case, you get several incompatible answers, one of which is usually adopted as the result of a physical struggle. History is written by the winners.

In the last analysis, our only claim to victory is that if we win the war we shall tell fewer lies about it than our adversaries. The really frightening thing about totalitarianism is not that it commits 'atrocities' but that it attacks the concept of objective truth; it claims to control the past as well as the future. Despite all the lying and self-righteousness that war encourages, I do not honestly think it can be said that that habit of mind is growing in Britain. Taking one thing with another, I should say that the press is slightly freer than it was before the war. I know out of my own experience that you can print things now which you couldn't print ten years ago. War resisters have probably been less maltreated in this war than in the last one, and the expression of unpopular opinion in public is certainly safer. There is some hope, therefore, that the liberal habit of mind, which thinks of truth as something outside yourself, something to be discovered, and not as something you can make up as you go along. But I still don't envy the future historian's job. Is it not a strange commentary on our time that even the casualties in the present war cannot be estimated within several millions?

Q.28

Which of the following is the main idea of the passage?

- ☐ An accurate account of history may be impossible to write.
- ☐ Only the victorious side is represented in history.
- ☐ Historians should be sceptical while studying historical records.
- ☐ Records do not present an accurate picture of what happened in the past.

Solution:

Bookmark

Correct Answer : 1

The author gives several examples to explain that the dominant side also dominates the perspectives and facts that are recorded and thus it is impossible to get a true account of what really happened. Also, the passage deals with the impossibility of task because of several factors. The passage is not about whether we should trust the records of history that we find but about how impossible and difficult it is to make an accurate recording. Options (2), (3) and (4) are correct but do not sufficiently represent the main idea of the passage.

 Answer key/Solution

FeedBack

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Q.29

What is the frightening thing about totalitarianism?

- 1 ☐ It controls the retelling of historical events.
- 2 ☐ The dominant side can control how it would be viewed in future.
- 3 ☐ It enables control of a few people over our past and our future.
- 4 ☐ The search for truth is futile in the shadow of totalitarianism.

Solution:

Correct Answer : 2

Refer to the lines- ".... it commits 'atrocities' but that it attacks the concept of objective truth; it claims to control the past as well as the future...." The author is trying to say that a totalitarian regime would commit atrocities and will be able to justify them by changing the moral absolutes of its times. This regime would be able to control what is being written and recorded and thus can change the way the future generations will view it.

FeedBack

 Bookmark

 Answer key/Solution

Directions for questions 28 to 30: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

During the Spanish Civil War, I found myself feeling very strongly that a true history of this war never would or could be written. Accurate ?gures, objectiv accounts of what was happening, simply did not exist. And if I felt that even in 1937, when the Spanish Government was still in being, and the lies which th various Republican factions were telling about each other and about the enemy were relatively small ones, how does the case stand now? Even if Franco is overthrown, what kind of records will the future historian have to go upon? And if Franco or anyone at all resembling him remains in power, the history of the war will consist quite largely of "facts" which millions of people now living know to be lies. One of these "facts", for instance, is that there was a considerable Russian army in Spain. There exists the most abundant evidence that there was no such army. Yet if Franco remains in power, and if Fascism i general survives, that Russian army will go into the history books and future school children will believe in it. So, for practical purposes the lie will have become truth.

This kind of thing is happening all the time. Out of the millions of instances which must be available, I will choose one which happens to be veri?able. Durir part of 1941 and 1942, when the Luftwaffe was busy in Russia, the German radio regaled its home audiences with stories of devastating air raids on

London. Now, we are aware that those raids did not happen. But what use would our knowledge be if the Germans conquered Britain? For the purposes of a future historian, did those raids happen, or didn't they? The answer is: If Hitler survives, they happened, and if he falls they didn't happen. Such is the case with innumerable other events of the past ten or twenty years. Is the Protocols of the Elders of Zion a genuine document? Did Trotsky plot with the Nazis? How many German aeroplanes were shot down in the Battle of Britain? Does Europe welcome the New Order? In no case, you get one answer which is universally accepted because it is true: in each case, you get several incompatible answers, one of which is usually adopted as the result of a physical struggle. History is written by the winners.

In the last analysis, our only claim to victory is that if we win the war we shall tell fewer lies about it than our adversaries. The really frightening thing about totalitarianism is not that it commits 'atrocities' but that it attacks the concept of objective truth; it claims to control the past as well as the future. Despite all the lying and self-righteousness that war encourages, I do not honestly think it can be said that that habit of mind is growing in Britain. Taking one thing with another, I should say that the press is slightly freer than it was before the war. I know out of my own experience that you can print things now which you couldn't print ten years ago. War resisters have probably been less maltreated in this war than in the last one, and the expression of unpopular opinion in public is certainly safer. There is some hope, therefore, that the liberal habit of mind, which thinks of truth as something outside yourself, something to be discovered, and not as something you can make up as you go along. But I still don't envy the future historian's job. Is it not a strange commentary on our time that even the casualties in the present war cannot be estimated within several millions?

Q.30

What is that 'liberal habit of mind' that author hopes about?

- 1 ☐ The mind believes that the truth shall prevail.
- 2 ☐ The mind believes that it is separate from the truth.
- 3 ☐ The mind believes that the truth cannot be altered.
- 4 ☐ The mind believes that truth will be discovered.

Solution:

Correct Answer : 3

Refer to the lines "truth as something outside yourself, something to be discovered, and not as something you can make up as you go along, will survive."

Q.31

The following question consists of a set of five sentences. These sentences need to be arranged in a coherent manner to create a meaningful paragraph. Type in the correct order of the sentences in the space provided below the question.

1. And he implored members of Congress to demonstrate political courage even if it goes against their party's positions.
2. But the former president focused much of his address on the legacy of Kennedy, as the library prepared to mark the 100th anniversary of his birth later this month.
3. Obama spoke of what is at stake for the millions of Americans who stand to lose coverage if the repeal of the Affordable Care Act passes.
4. These comments from Obama come a few days after the House squeaked through a partial repeal and replacement of Obamacare with a 217-213 vote, a long-promised goal of Republicans who have decried the bill since its passing.
5. He noted the Kennedys had long advocated for healthcare reform and, in particular, the late Senator Edward Kennedy, who died of brain cancer before passage of the Affordable Care Act.

Solution:

Correct Answer : 31254

Your Answer : 12345

31254

3 introduces the paragraph with the name "Obama". 1 further extends his stance mentioned in 3. Hence, 31 makes a mandatory pair. 25 makes a mandatory pair as both the statements talk about the Kennedys. 4 is the conclusion as it surmises "these comments".

Q.32

In this question, five sentences are given. Of these, four sentences can be logically sequenced to make a coherent paragraph. One of the sentences does not belong to the paragraph. Type in the sentence number that doesn't fit into the paragraph.

1. In fact, the ice gola guy — news about whom went viral after he named his pushcart after Google — did better when it came to this.
2. Apart from signalling intellectual laziness and a distinct lack of originality, the biggest problem with harking to another start-up in your name is how it limits the ambition of what the start-up wishes to be.
3. And it often is.
4. Don't just start a business because something is in vogue and you think commercializing it will make money.
5. And for start-ups, this lack of ambition should be crippling.

Solution:**Correct Answer : 4****Your Answer : 12345**

2153 is the correct sequence. 'this lack of ambition' in 5 refers to 'limit the ambition in 2. But statement 1 is an example and explanation of 2 so should come between 2 and 5. 53 is a mandatory pair. 4 is the odd one out as it gives a general view of business and doesn't specifically talk about the lack of ambition in start ups.

Bookmark
Answer key/Solution
Q.33

The following question consists of a paragraph followed by four summaries. Choose the option that best captures the essence of the paragraph. Type in the option number in the space provided below the question.

The reference to Buddha in the title *Buddha in a Traffic Jam* has no connection either with Prince Siddhartha who later became Gautama the Buddha or with the Ambedkarite movement. To Agnihotri, the word 'Buddha' is simply shorthand for a bright idea, a Eureka moment. The film is set mostly in a business school, and partly in Bastar. The idea is to highlight how young talent is wasted on misguided activism and kept away from innovating cutting-edge solutions that might actually improve the state of affairs in India. They are stuck, according to Agnihotri, in the traffic jam of mediocrity.

1. *Buddha in a Traffic Jam* deals with the issue of young talent being wasted on misguided activism which, in turn, hampers the national social fabric.
2. *Buddha in a Traffic Jam* deals with the issue of young talent who are trapped in a system of mediocrity such as misguided activism.
3. *Buddha in a Traffic Jam* has a misleading albeit poignant title which refers to the wastage of national human resources on misguided political ambitions.
4. *Buddha in a Traffic Jam* is revolutionary film that attacks the misguided political activism of small town youth.

Solution:**Correct Answer : 2****Your Answer : 1**

Only 2 refers to the central point of the paragraph. 4 is a conclusion. 3 twists the tone of the author (misleading title). 1 talks about national social fabric which is not discussed in the paragraph.

Bookmark
Answer key/Solution
Q.34

The following question consists of a paragraph followed by four summaries. Choose the option that best captures the essence of the paragraph. Type in the option number in the space provided below the question.

How do we know when a language is endangered? Every language can and has been used to express all aspects of society, says David Crystal; a first sign of endangerment is when a language starts to lose its functions, its use in certain contexts of daily life. Alongside this often come substantial changes to the actual structure of the language – not just some borrowed words, but deep changes to the sound and grammar of the language. Ultimately, the crucial question is whether a language is still being passed down to children.

1. A language becomes endangered when its grammar is tampered with and it is not passed down to children.
2. A language becomes endangered when the first sign of endangerment is found which results in its losing its functions.
3. David Crystal defines the evolution of the endangered language by means of grammar and core structure.
4. A language becomes endangered when its routine functions and core structure are affected due to substantial changes to its semantics.

Solution:**Correct Answer : 4****Your Answer : 1**

Option 1 and 3 can be eliminated as they go beyond the paragraph. "tampered with" and "evolution of endangered language" are not mentioned in the paragraph. Option 2 is misleading as "losing its core functions" is the sign itself and not a consequence.

Bookmark
Answer key/Solution

Sec 2

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Emmu, a shopkeeper, has seven items – P, Q, R, S, T, U and V – in his shops. The cost prices of items are Rs. 80, Rs. 90, Rs. 120, Rs. 100, Rs. 75, Rs. 60 and Rs. 125, not necessarily in the same order. The selling prices (in binary system) of the given items are Rs. 111100, Rs. 10010110, Rs. 1001011, Rs. 1111101, R

10101111, Rs. 1100100 and Rs. 110000, not necessarily in the same order. It is also known that:

- (i) The cost price of T, which is sold at a profit less than 30%, is equal to the average of the cost price of Q and that of V.
- (ii) The profit made on one of the items is twice the amount of profit made on exactly two other items.
- (iii) The selling price of the item on which the shopkeeper incurs a loss of 16.67% is 40% less than the cost price of P.
- (iv) The profit made on the item that is sold at Rs. 150 is 25%.
- (v) The profit (in base 8) on the item that is sold at Rs.175 is Rs. 62.
- (vi) The cost price of item R is 50% more than the cost price of U.
- (vii) All the given numbers are in decimal system unless otherwise is mentioned.

Q.35

What is the cost price of S?

1 ☐ Rs. 75

2 ☐ Rs. 125

3 ☐ Rs. 100

4 ☐ Cannot be determined

Solution:

Correct Answer : 1

The decimal equivalent corresponding to the given values of selling prices in binary system is tabulated below:

Binary System	Decimal System
111100	60
10010110	150
1001011	75
1111101	125
10101111	175
1100100	100
110000	48

Using condition (v), since the profit made on the item the selling price of which is Rs. 175 is Rs. (62)₈ = Rs. 50, cost price of that item = 175 – 50 = Rs. 125.

From statement (ii), it can be deduced that the selling prices of items whose cost prices are Rs. 75, Rs. 100 and Rs. 125 are Rs. 100, Rs. 125 and Rs. 175 respectively.

Using condition (iv), since the profit made on the item the selling price of which Rs. 125 is 25%, the cost price of that

$$\text{item} = \frac{100}{125} \times 150 = \text{Rs.}120.$$

Using condition (vi), either cost price of item U is Rs. 80 and that of item R is Rs. 120, or cost price of U is Rs. 60 and that of R is Rs. 90.

Using (iii), the selling price of the item on which a loss of 16.67% is incurred has to be Rs. 75 and thus its cost price is Rs. 90. Hence, the cost price of P is Rs. 125.

Further analysis leads to the following table:

Selling price (in Rs.)	Cost price (in Rs.)	Item	Profit/Loss (in Rs.)
60/48	60	U	0/-12
150	120	Q/V	30
75	90	R	-15
125	100	T	25
175	125	P	50
100	75	S	25
48/60	80	V/Q	-32/-20

The cost price of S = Rs. 75.

Feedback

Bookmark

Answer key/Solution

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Emmu, a shopkeeper, has seven items – P, Q, R, S, T, U and V – in his shops. The cost prices of items are Rs. 80, Rs. 90, Rs. 120, Rs. 100, Rs. 75, Rs. 60 and Rs. 125, not necessarily in the same order. The selling prices (in binary system) of the given items are Rs. 111100, Rs. 10010110, Rs. 1001011, Rs. 1111101, R 10101111, Rs. 1100100 and Rs. 110000, not necessarily in the same order. It is also known that:

- (i) The cost price of T, which is sold at a profit less than 30%, is equal to the average of the cost price of Q and that of V.
- (ii) The profit made on one of the items is twice the amount of profit made on exactly two other items.
- (iii) The selling price of the item on which the shopkeeper incurs a loss of 16.67% is 40% less than the cost price of P.
- (iv) The profit made on the item that is sold at Rs. 150 is 25%.
- (v) The profit (in base 8) on the item that is sold at Rs.175 is Rs. 62.
- (vi) The cost price of item R is 50% more than the cost price of U.
- (vii) All the given numbers are in decimal system unless otherwise is mentioned.

Q.36

If the cost price of V is more than that of Q, what is the absolute difference between the maximum and minimum possible values of selling price of Q?

- 1 ☐ Rs. 12
- 2 ☐ Rs. 25
- 3 ☐ Rs. 40
- 4 ☐ Rs. 48

Solution:

Correct Answer : 1

The decimal equivalent corresponding to the given values of selling prices in binary system is tabulated below:

Binary System	Decimal System
111100	60
10010110	150
1001011	75
1111101	125
10101111	175
1100100	100
110000	48

Using condition (v), since the profit made on the item the selling price of which is Rs. 175 is Rs. $(62)_3 = \text{Rs. } 50$, cost price of that item = $175 - 50 = \text{Rs. } 125$.

From statement (ii), it can be deduced that the selling prices of items whose cost prices are Rs. 75, Rs. 100 and Rs. 125 are Rs. 100, Rs. 125 and Rs. 175 respectively.

Using condition (iv), since the profit made on the item the selling price of which Rs. 125 is 25%, the cost price of that

$$\text{item} = \frac{100}{125} \times 150 = \text{Rs. } 120.$$

Using condition (vi), either cost price of item U is Rs. 80 and that of item R is Rs. 120, or cost price of U is Rs. 60 and that of R is Rs. 90.

Using (iii), the selling price of the item on which a loss of 16.67% is incurred has to be Rs. 75 and thus its cost price is Rs. 90. Hence, the cost price of P is Rs. 125.

Further analysis leads to the following table:

Selling price (in Rs.)	Cost price (in Rs.)	Item	Profit/Loss (in Rs.)
60/48	60	U	0/-12
150	120	Q/V	30
75	90	R	-15
125	100	T	25
175	125	P	50
100	75	S	25
48/60	80	V/Q	-32/-20

If the cost price of item V is more than that of Q, then cost price of Q is Rs. 80. Then, selling price of Q can be either Rs. 48 or Rs. 60. Hence, the required difference = $60 - 48 = \text{Rs. } 12$

FeedBack

Bookmark

Answer key/Solution

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Emmu, a shopkeeper, has seven items – P, Q, R, S, T, U and V – in his shops. The cost prices of items are Rs. 80, Rs. 90, Rs. 120, Rs. 100, Rs. 75, Rs. 60 and Rs. 125, not necessarily in the same order. The selling prices (in binary system) of the given items are Rs. 111100, Rs. 10010110, Rs. 1001011, Rs. 1111101, Rs. 10101111, Rs. 1100100 and Rs. 110000, not necessarily in the same order. It is also known that:

- The cost price of T, which is sold at a profit less than 30%, is equal to the average of the cost price of Q and that of V.
- The profit made on one of the items is twice the amount of profit made on exactly two other items.
- The selling price of the item on which the shopkeeper incurs a loss of 16.67% is 40% less than the cost price of P.
- The profit made on the item that is sold at Rs. 150 is 25%.
- The profit (in base 8) on the item that is sold at Rs. 175 is Rs. 62.
- The cost price of item R is 50% more than the cost price of U.
- All the given numbers are in decimal system unless otherwise is mentioned.

Q.37

What is the average of selling prices (in base 8) of R and T?

- 1 ☐ Rs. 141
- 2 ☐ Rs. 144

3 ☐ Rs. 1744 ☐ Cannot be determined**Solution:****Correct Answer : 2**

The decimal equivalent corresponding to the given values of selling prices in binary system is tabulated below:

Binary System	Decimal System
111100	60
10010110	150
1001011	75
1111101	125
10101111	175
1100100	100
110000	48

Using condition (v), since the profit made on the item the selling price of which is Rs. 175 is Rs. $(62)_8 = \text{Rs. } 50$, cost price of that item = $175 - 50 = \text{Rs. } 125$.

From statement (ii), it can be deduced that the selling prices of items whose cost prices are Rs. 75, Rs. 100 and Rs. 125 are Rs. 100, Rs. 125 and Rs. 175 respectively.

Using condition (iv), since the profit made on the item the selling price of which Rs. 125 is 25%, the cost price of that

$$\text{item} = \frac{100}{125} \times 150 = \text{Rs. } 120.$$

Using condition (vi), either cost price of item U is Rs. 80 and that of item R is Rs. 120, or cost price of U is Rs. 60 and that of R is Rs. 90.

Using (iii), the selling price of the item on which a loss of 16.67% is incurred has to be Rs. 75 and thus its cost price is Rs. 90. Hence, the cost price of P is Rs. 125.

Further analysis leads to the following table:

Selling price (in Rs.)	Cost price (in Rs.)	Item	Profit/Loss (in Rs.)
60/48	60	U	0/-12
150	120	Q/V	30
75	90	R	-15
125	100	T	25
175	125	P	50
100	75	S	25
48/60	80	V/Q	-32/-20

Average of selling prices of R and T

$$= \frac{75 + 125}{2} = \text{Rs. } 100$$

Hence, $(100)_{10} = (144)_8$.

[FeedBack](#)

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Emmu, a shopkeeper, has seven items – P, Q, R, S, T, U and V – in his shops. The cost prices of items are Rs. 80, Rs. 90, Rs. 120, Rs. 100, Rs. 75, Rs. 60 and Rs. 125, not necessarily in the same order. The selling prices (in binary system) of the given items are Rs. 111100, Rs. 10010110, Rs. 1001011, Rs. 1111101, Rs. 10101111, Rs. 1100100 and Rs. 110000, not necessarily in the same order. It is also known that:

- The cost price of T, which is sold at a profit less than 30%, is equal to the average of the cost price of Q and that of V.
- The profit made on one of the items is twice the amount of profit made on exactly two other items.
- The selling price of the item on which the shopkeeper incurs a loss of 16.67% is 40% less than the cost price of P.
- The profit made on the item that is sold at Rs. 150 is 25%.
- The profit (in base 8) on the item that is sold at Rs.175 is Rs. 62.
- The cost price of item R is 50% more than the cost price of U.
- All the given numbers are in decimal system unless otherwise is mentioned.

Q.38**What is the selling price of S?**1 ☐ Rs. 1252 ☐ Rs. 1003 ☐ Rs. 1504 ☐ Cannot be determined[Bookmark](#)[Answer key/Solution](#)

Solution:**Correct Answer : 2**

The decimal equivalent corresponding to the given values of selling prices in binary system is tabulated below:

Binary System	Decimal System
111100	60
10010110	150
1001011	75
1111101	125
10101111	175
1100100	100
110000	48

Using condition (v), since the profit made on the item the selling price of which is Rs. 175 is Rs. $(62)_2 = \text{Rs. } 50$, cost price of that item = $175 - 50 = \text{Rs. } 125$.

From statement (ii), it can be deduced that the selling prices of items whose cost prices are Rs. 75, Rs. 100 and Rs. 125 are Rs. 100, Rs. 125 and Rs. 175 respectively.

Using condition (iv), since the profit made on the item the selling price of which Rs. 125 is 25%, the cost price of that

$$\text{item} = \frac{100}{125} \times 150 = \text{Rs. } 120.$$

Using condition (vi), either cost price of item U is Rs. 80 and that of item R is Rs. 120, or cost price of U is Rs. 60 and that of R is Rs. 90.

Using (iii), the selling price of the item on which a loss of 16.67% is incurred has to be Rs. 75 and thus its cost price is Rs. 90. Hence, the cost price of P is Rs. 125.

Further analysis leads to the following table:

Selling price (in Rs.)	Cost price (in Rs.)	Item	Profit/Loss (in Rs.)
60/48	60	U	0/-12
150	120	Q/V	30
75	90	R	-15
125	100	T	25
175	125	P	50
100	75	S	25
48/60	80	V/Q	-32/-20

The selling price of item S = Rs. 100

FeedBack

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

There are five restaurants – Alpha, Beta, Gama, Delta and Gelta – in a city. Each of these restaurants serves three different cuisines out of Japanese, Italia Punjabi, Continental and South Indian. Each of these restaurants has a different rating out of 1Star, 2Star, 3Star, 4Star and 5Star, not necessarily in the same order, and is located in a different city from among Mumbai, Delhi, Kinnuar, Kanpur and Jaipur, not necessarily in the same order. No two restaurants offer the same set of three cuisines. There are exactly three cuisines out of the five that are served at exactly three restaurants each, and each cuisine is served at at least two restaurants. Gelta, which is neither 2Star nor 3Star restaurant, is located in Kinnaur. Punjabi cuisine is not served at the restaurants that are in Jaipur and Kanpur. Japanese cuisine is served at minimum number of restaurants. Two of three cuisines served by Beta, which is 5Star restaurant located in Mumbai, are Italian and Continental. The number of restaurants at which South Indian cuisine is served is not 3. Delta, which is located in Delhi is 1star restaurant. One of the cuisines served at 4Star restaurant is Italian. Alpha, which is not in Jaipur, does not serve Continental cuisine.

Q.39

The cuisines served at Alpha are

1 ☐ Japanese, Italian and South Indian

2 ☐ Italian, Punjabi and Japanese

3 ☐ Italian, Punjabi and Continental

4 ☐ Cannot be determined

Solution:**Correct Answer : 1****Bookmark****Answer key/Solution**

We are given that Japanese cuisine is served at minimum number of restaurants, and therefore, it will be served at 2 restaurants. The number of restaurants at which South Indian cuisine is served is not 3, and therefore, it can only be 4. Remaining 3 cuisines will be served at exactly 3 restaurants each.

Using other information, we can conclude the following:

Restaurant	Rating	City	Cuisines
Alpha	2Star/3Star	Kanpur	South Indian, Japanese, Italian
Beta	5Star	Mumbai	Italian, Continental, Punjabi
Gama	3Star/2Star	Jaipur	Continental, South Indian, Japanese
Delta	1Star	Delhi	Punjabi, South Indian, Continental
Gelta	4Star	Kinnaur	Italian, Punjabi, South Indian

The cuisines served at Alpha are Japanese, Italian and South Indian.

FeedBack

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

There are five restaurants – Alpha, Beta, Gama, Delta and Gelta – in a city. Each of these restaurants serves three different cuisines out of Japanese, Italian, Punjabi, Continental and South Indian. Each of these restaurants has a different rating out of 1Star, 2Star, 3Star, 4Star and 5Star, not necessarily in the same order, and is located in a different city from among Mumbai, Delhi, Kinnaur, Kanpur and Jaipur, not necessarily in the same order. No two restaurants offer the same set of three cuisines. There are exactly three cuisines out of the five that are served at exactly three restaurants each, and each cuisine is served at at least two restaurants. Gelta, which is neither 2Star nor 3Star restaurant, is located in Kinnaur. Punjabi cuisine is not served at the restaurants that are in Jaipur and Kanpur. Japanese cuisine is served at minimum number of restaurants. Two of three cuisines served by Beta, which is 5Star restaurant located in Mumbai, are Italian and Continental. The number of restaurants at which South Indian cuisine is served is not 3. Delta, which is located in Delhi, is 1star restaurant. One of the cuisines served at 4Star restaurant is Italian. Alpha, which is not in Jaipur, does not serve Continental cuisine.

Q.40

The rating of Alpha is

1 ☐ 1Star

2 ☐ 2Star

3 ☐ 3Star

4 ☐ Cannot be determined

Solution:

Correct Answer : 4

We are given that Japanese cuisine is served at minimum number of restaurants, and therefore, it will be served at 2 restaurants. The number of restaurants at which South Indian cuisine is served is not 3, and therefore, it can only be 4. Remaining 3 cuisines will be served at exactly 3 restaurants each.

Using other information, we can conclude the following:

Restaurant	Rating	City	Cuisines
Alpha	2Star/3Star	Kanpur	South Indian, Japanese, Italian
Beta	5Star	Mumbai	Italian, Continental, Punjabi
Gama	3Star/2Star	Jaipur	Continental, South Indian, Japanese
Delta	1Star	Delhi	Punjabi, South Indian, Continental
Gelta	4Star	Kinnaur	Italian, Punjabi, South Indian

The rating of Alpha can be either 2Star or 3Star. Hence, question cannot be answered.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

There are five restaurants – Alpha, Beta, Gama, Delta and Gelta – in a city. Each of these restaurants serves three different cuisines out of Japanese, Italian, Punjabi, Continental and South Indian. Each of these restaurants has a different rating out of 1Star, 2Star, 3Star, 4Star and 5Star, not necessarily in the same order, and is located in a different city from among Mumbai, Delhi, Kinnaur, Kanpur and Jaipur, not necessarily in the same order. No two restaurants

offer the same set of three cuisines. There are exactly three cuisines out of the five that are served at exactly three restaurants each, and each cuisine is served at at least two restaurants. Gelta, which is neither 2Star nor 3Star restaurant, is located in Kinnaur. Punjabi cuisine is not served at the restaurants that are in Jaipur and Kanpur. Japanese cuisine is served at minimum number of restaurants. Two of three cuisines served by Beta, which is 5Star restaurant located in Mumbai, are Italian and Continental. The number of restaurants at which South Indian cuisine is served is not 3. Delta, which is located in Delhi is 1star restaurant. One of the cuisines served at 4Star restaurant is Italian. Alpha, which is not in Jaipur, does not serve Continental cuisine.

Q.41

Which of the following cuisines are not served at the restaurant that is in Kanpur?

- 1 ☐ Punjabi and Italian
- 2 ☐ Punjabi and Continental
- 3 ☐ South Indian and Continental
- 4 ☐ South Indian and Punjabi

Solution:

Correct Answer : 2

We are given that Japanese cuisine is served at minimum number of restaurants, and therefore, it will be served at 2 restaurants. The number of restaurants at which South Indian cuisine is served is not 3, and therefore, it can only be 4. Remaining 3 cuisines will be served at exactly 3 restaurants each.

Using other information, we can conclude the following:

Restaurant	Rating	City	Cuisines
Alpha	2Star/3Star	Kanpur	South Indian, Japanese, Italian
Beta	5Star	Mumbai	Italian, Continental, Punjabi
Gama	3Star/2Star	Jaipur	Continental, South Indian, Japanese
Delta	1Star	Delhi	Punjabi, South Indian, Continental
Gelta	4Star	Kinnaur	Italian, Punjabi, South Indian

Punjabi and Continental cuisines are not served at the restaurant that is in Kanpur.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

There are five restaurants – Alpha, Beta, Gama, Delta and Gelta – in a city. Each of these restaurants serves three different cuisines out of Japanese, Italian, Punjabi, Continental and South Indian. Each of these restaurants has a different rating out of 1Star, 2Star, 3Star, 4Star and 5Star, not necessarily in the same order, and is located in a different city from among Mumbai, Delhi, Kinnaur, Kanpur and Jaipur, not necessarily in the same order. No two restaurants offer the same set of three cuisines. There are exactly three cuisines out of the five that are served at exactly three restaurants each, and each cuisine is served at at least two restaurants. Gelta, which is neither 2Star nor 3Star restaurant, is located in Kinnaur. Punjabi cuisine is not served at the restaurants that are in Jaipur and Kanpur. Japanese cuisine is served at minimum number of restaurants. Two of three cuisines served by Beta, which is 5Star restaurant located in Mumbai, are Italian and Continental. The number of restaurants at which South Indian cuisine is served is not 3. Delta, which is located in Delhi is 1star restaurant. One of the cuisines served at 4Star restaurant is Italian. Alpha, which is not in Jaipur, does not serve Continental cuisine.

Q.42

The restaurant in Jaipur is

- 1 ☐ Alpha
- 2 ☐ Delta
- 3 ☐ Gama
- 4 ☐ Cannot be determined

Solution:

Correct Answer : 3

Bookmark

Answer key/Solution

We are given that Japanese cuisine is served at minimum number of restaurants, and therefore, it will be served at 2 restaurants. The number of restaurants at which South Indian cuisine is served is not 3, and therefore, it can only be 4. Remaining 3 cuisines will be served at exactly 3 restaurants each.

Using other information, we can conclude the following:

Restaurant	Rating	City	Cuisines
Alpha	2Star/3Star	Kanpur	South Indian, Japanese, Italian
Beta	5Star	Mumbai	Italian, Continental, Punjabi
Gamma	3Star/2Star	Jaipur	Continental, South Indian, Japanese
Delta	1Star	Delhi	Punjabi, South Indian, Continental
Epsilon	4Star	Kinnaur	Italian, Punjabi, South Indian

The restaurant in Jaipur is Gamma.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five friends – Amrit, Anjana, Arman, Anjali and Arpit – participated in a quiz having 9 questions. In the quiz, four questions were of 4 marks each and the remaining five questions were of 8 marks each. Any question answered wrongly attracts a penalty of one-fourth of the marks allotted to the question. After the release of the results of the quiz, the following observations were made regarding the number of questions attempted and marks obtained by the five friends in the quiz:

- The friend who attempted an equal number of 4 marker and 8 marker questions scored 28 marks.
- The number of 4 marker questions attempted correctly by one of the friends was equal to the average of number of 4 marker questions attempted correctly by the other two friends, neither of whom attempted an even number of 4 marker questions correctly.
- Arman, who attempted exactly one 4 marker question correctly, scored 32 marks.
- The number of 8 marker questions attempted correctly by Anjana, who did not attempt any question wrongly and scored marks which was twice the square of a natural number, was half the number of 4 marker questions attempted correctly by her.
- Anjali attempted the maximum number of questions.
- The number of 4 marker questions attempted correctly by Armit was one less than that by Arpit.
- For no two friends, the number of 4 marker questions attempted correctly by them was the same.
- The number of 8 marker questions attempted correctly by Anjali, Arpit and Arman, in the given order, forms a Geometric Progression.
- The score of Arpit was the square of a natural number.

Q.43

What was the sum of marks scored by Anjali and that by Arpit?

Solution:

Correct Answer : 21

Bookmark

Answer key/Solution

The quiz contains 9 questions – four questions of 4 marks each and five questions of 8 marks each. So, maximum marks for the quiz will be 56.

According to the given condition, penalty for 4 marker questions is -1 marks and that for 8 marker questions is -2 marks.

From statement (iii), the number of 8 marker questions attempted correctly by Arman is 4 and the number of 4 marker and 8 marker questions attempted wrongly by him is 2 and 1 respectively.

From statement (iv), the number of 4 marker and 8 marker questions attempted correctly by Anjana is 4 and 2 respectively, and her score is 32.

From statement (vi) and (vii), the number of 4 marker questions attempted correctly by Amrit, Arpit and Anjali is 2, 3 and 0 respectively.

From statement (viii), the number of 8 marker questions attempted correctly by Arman, Arpit and Anjali is 4, 2 and 1 respectively.

From statement (ix), the number of 4 marker and 8 marker questions attempted wrongly by Arpit is 1 each, and the marks scored by him is 25.

Using statements (i) and (v) along with the conclusions drawn above, we get the following table:

Friend	4 Marker		8 Marker		Score
	Correct	Incorrect	Correct	Incorrect	
Amrit	2	2	3	1	28
Anjana	4	0	2	0	32
Arman	1	2	4	1	32
Anjali	0	4	1	4	-4
Arpit	3	1	2	1	25

Sum of marks scored by Anjali and that by Arpit
 $= -4 + 25 = 21$.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five friends – Amrit, Anjana, Arman, Anjali and Arpit – participated in a quiz having 9 questions. In the quiz, four questions were of 4 marks each and the remaining five questions were of 8 marks each. Any question answered wrongly attracts a penalty of one-fourth of the marks allotted to the question. After the release of the results of the quiz, the following observations were made regarding the number of questions attempted and marks obtained by the five friends in the quiz:

- The friend who attempted an equal number of 4 marker and 8 marker questions scored 28 marks.
- The number of 4 marker questions attempted correctly by one of the friends was equal to the average of number of 4 marker questions attempted correctly by the other two friends, neither of whom attempted an even number of 4 marker questions correctly.
- Arman, who attempted exactly one 4 marker question correctly, scored 32 marks.
- The number of 8 marker questions attempted correctly by Anjana, who did not attempt any question wrongly and scored marks which was twice the square of a natural number, was half the number of 4 marker questions attempted correctly by her.
- Anjali attempted the maximum number of questions.
- The number of 4 marker questions attempted correctly by Amrit was one less than that by Arpit.
- For no two friends, the number of 4 marker questions attempted correctly by them was the same.
- The number of 8 marker questions attempted correctly by Anjali, Arpit and Arman, in the given order, forms a Geometric Progression.
- The score of Arpit was the square of a natural number.

Q.44

What was the sum of number of 8 marker questions attempted correctly by the five friends?

Solution:

Correct Answer : 12

Bookmark

Answer key/Solution

The quiz contains 9 questions – four questions of 4 marks each and five questions of 8 marks each. So, maximum marks for the quiz will be 56.

According to the given condition, penalty for 4 marker questions is –1 marks and that for 8 marker questions is –2 marks.

From statement (iii), the number of 8 marker questions attempted correctly by Arman is 4 and the number of 4 marker and 8 marker questions attempted wrongly by him is 2 and 1 respectively.

From statement (iv), the number of 4 marker and 8 marker questions attempted correctly by Anjana is 4 and 2 respectively, and her score is 32.

From statement (vi) and (vii), the number of 4 marker questions attempted correctly by Amrit, Arpit and Anjali is 2, 3 and 0 respectively.

From statement (viii), the number of 8 marker questions attempted correctly by Arman, Arpit and Anjali is 4, 2 and 1 respectively.

From statement (ix), the number of 4 marker and 8 marker questions attempted wrongly by Arpit is 1 each, and the marks scored by him is 25.

Using statements (i) and (v) along with the conclusions drawn above, we get the following table:

Friend	4 Marker		8 Marker		Score
	Correct	Incorrect	Correct	Incorrect	
Amrit	2	2	3	1	28
Anjana	4	0	2	0	32
Arman	1	2	4	1	32
Anjali	0	4	1	4	–4
Arpit	3	1	2	1	25

Sum of number of 8 marker questions attempted correctly by the five friends = $3 + 2 + 4 + 1 + 2 = 12$.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five friends – Amrit, Anjana, Arman, Anjali and Arpit – participated in a quiz having 9 questions. In the quiz, four questions were of 4 marks each and the remaining five questions were of 8 marks each. Any question answered wrongly attracts a penalty of one-fourth of the marks allotted to the question. After the release of the results of the quiz, the following observations were made regarding the number of questions attempted and marks obtained by the five friends in the quiz:

- (i) The friend who attempted an equal number of 4 marker and 8 marker questions scored 28 marks.
- (ii) The number of 4 marker questions attempted correctly by one of the friends was equal to the average of number of 4 marker questions attempted correctly by the other two friends, neither of whom attempted an even number of 4 marker questions correctly.
- (iii) Arman, who attempted exactly one 4 marker question correctly, scored 32 marks.
- (iv) The number of 8 marker questions attempted correctly by Anjana, who did not attempt any question wrongly and scored marks which was twice the square of a natural number, was half the number of 4 marker questions attempted correctly by her.
- (v) Anjali attempted the maximum number of questions.
- (vi) The number of 4 marker questions attempted correctly by Amrit was one less than that by Arpit.
- (vii) For no two friends, the number of 4 marker questions attempted correctly by them was the same.
- (viii) The number of 8 marker questions attempted correctly by Anjali, Arpit and Arman, in the given order, forms a Geometric Progression.
- (ix) The score of Arpit was the square of a natural number.

Q.45

What was the absolute difference between the number of 4 marker questions attempted correctly by Anjana and the number of 8 marker questions attempted incorrectly by Anjali?

Solution:

Correct Answer : 0

Bookmark

Answer key/Solution

The quiz contains 9 questions – four questions of 4 marks each and five questions of 8 marks each. So, maximum marks for the quiz will be 56.

According to the given condition, penalty for 4 marker questions is –1 marks and that for 8 marker questions is –2 marks.

From statement (iii), the number of 8 marker questions attempted correctly by Arman is 4 and the number of 4 marker and 8 marker questions attempted wrongly by him is 2 and 1 respectively.

From statement (iv), the number of 4 marker and 8 marker questions attempted correctly by Anjana is 4 and 2 respectively, and her score is 32.

From statement (vi) and (vii), the number of 4 marker questions attempted correctly by Amrit, Arpit and Anjali is 2, 3 and 0 respectively.

From statement (viii), the number of 8 marker questions attempted correctly by Arman, Arpit and Anjali is 4, 2 and 1 respectively.

From statement (ix), the number of 4 marker and 8 marker questions attempted wrongly by Arpit is 1 each, and the marks scored by him is 25.

Using statements (i) and (v) along with the conclusions drawn above, we get the following table:

Friend	4 Marker		8 Marker		Score
	Correct	Incorrect	Correct	Incorrect	
Amrit	2	2	3	1	28
Anjana	4	0	2	0	32
Arman	1	2	4	1	32
Anjali	0	4	1	4	–4
Arpit	3	1	2	1	25

The required difference = $|4 - 4| = 0$.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five friends – Amrit, Anjana, Arman, Anjali and Arpit – participated in a quiz having 9 questions. In the quiz, four questions were of 4 marks each and the remaining five questions were of 8 marks each. Any question answered wrongly attracts a penalty of one-fourth of the marks allotted to the question. After the release of the results of the quiz, the following observations were made regarding the number of questions attempted and marks obtained by the five friends in the quiz:

- (i) The friend who attempted an equal number of 4 marker and 8 marker questions scored 28 marks.
- (ii) The number of 4 marker questions attempted correctly by one of the friends was equal to the average of number of 4 marker questions attempted correctly by the other two friends, neither of whom attempted an even number of 4 marker questions correctly.
- (iii) Arman, who attempted exactly one 4 marker question correctly, scored 32 marks.
- (iv) The number of 8 marker questions attempted correctly by Anjana, who did not attempt any question wrongly and scored marks which was twice the square of a natural number, was half the number of 4 marker questions attempted correctly by her.
- (v) Anjali attempted the maximum number of questions.
- (vi) The number of 4 marker questions attempted correctly by Amrit was one less than that by Arpit.
- (vii) For no two friends, the number of 4 marker questions attempted correctly by them was the same.
- (viii) The number of 8 marker questions attempted correctly by Anjali, Arpit and Arman, in the given order, forms a Geometric Progression.
- (ix) The score of Arpit was the square of a natural number.

Q.46

The number of questions attempted by Amrit in the quiz was

Solution:

Correct Answer : 8

Bookmark

Answer key/Solution

The quiz contains 9 questions – four questions of 4 marks each and five questions of 8 marks each. So, maximum marks for the quiz will be 56.

According to the given condition, penalty for 4 marker questions is –1 marks and that for 8 marker questions is –2 marks.

From statement (iii), the number of 8 marker questions attempted correctly by Arman is 4 and the number of 4 marker and 8 marker questions attempted wrongly by him is 2 and 1 respectively.

From statement (iv), the number of 4 marker and 8 marker questions attempted correctly by Anjana is 4 and 2 respectively, and her score is 32.

From statement (vi) and (vii), the number of 4 marker questions attempted correctly by Amrit, Arpit and Anjali is 2, 3 and 0 respectively.

From statement (viii), the number of 8 marker questions attempted correctly by Arman, Arpit and Anjali is 4, 2 and 1 respectively.

From statement (ix), the number of 4 marker and 8 marker questions attempted wrongly by Arpit is 1 each, and the marks scored by him is 25.

Using statements (i) and (v) along with the conclusions drawn above, we get the following table:

Friend	4 Marker		8 Marker		Score
	Correct	Incorrect	Correct	Incorrect	
Amrit	2	2	3	1	28
Anjana	4	0	2	0	32
Arman	1	2	4	1	32
Anjali	0	4	1	4	–4
Arpit	3	1	2	1	25

The number of questions attempted by Amrit in the quiz = $2 + 2 + 3 + 1 = 8$.

FeedBack

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

A survey was conducted by an agency named Darpan AX Ltd in a city among 735 people to gauge the popularity of three electronic gadgets – Smartphone, Laptop and Tablet. The number of persons who like Smartphone and Laptop is 20% less than the number of persons who like Tablet and Laptop. The number of persons who like only Smartphone is 13 more than 24 times the number of persons who like all the three gadgets. The number of persons who like only Tablet is 8 less than four times of the number of persons who like only Laptop. The number of persons who like Smartphone and Tablet is double the number of persons who like Smartphone and Laptop. The ratio of the number of persons who like only Tablet to that of those who like Smartphone and Tablet but not Laptop is 12 : 7. The number of persons who like all the three gadgets is one-third of the number of persons who like Smartphone and Laptop but not Tablet. The number of persons who like only Laptop is 20 more than one-seventh of one-seventh of the total number of people who participated in the survey.

Q.47

What is the number of persons who like Laptop?

1 ☐ 115

2 ☐ 123

3 ☐ 227

4 ☐ 277

Solution:

Correct Answer : 2

Bookmark

Answer key/Solution

Total number of persons surveyed = 735.

From the information given, number of persons who like only

$$\text{laptop} = 20 + \frac{1}{7} \times \frac{1}{7} \times 735 = 35.$$

Number of persons who like only tablet = $4 \times 35 - 8 = 132$.

Let the number of persons who like all three gadgets be x .

$$\text{Also, } \frac{132}{y} = \frac{12}{7} \Rightarrow y = 77$$

$$(3x + x) = \frac{8}{10} (x + a)$$

$$\Rightarrow a = 4x \quad \dots (i)$$

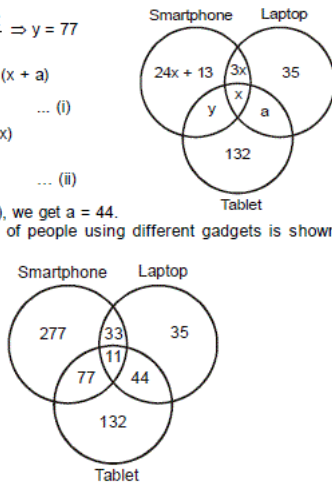
$$y + x = 2(3x + x)$$

$$\Rightarrow y = 7x$$

$$\Rightarrow x = 11 \quad \dots (ii)$$

From (i) and (ii), we get $a = 44$.

Final break-up of people using different gadgets is shown below:



Number of persons who like Laptop
= $35 + 33 + 11 + 44 = 123$.

FeedBack

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

A survey was conducted by an agency named Darpan AX Ltd in a city among 735 people to gauge the popularity of three electronic gadgets – Smartphone, Laptop and Tablet. The number of persons who like Smartphone and Laptop is 20% less than the number of persons who like Tablet and Laptop. The number of persons who like only Smartphone is 13 more than 24 times the number of persons who like all the three gadgets. The number of persons who like only Tablet is 8 less than four times of the number of persons who like only Laptop. The number of persons who like Smartphone and Tablet is double the number of persons who like Smartphone and Laptop. The ratio of the number of persons who like only Tablet to that of those who like Smartphone and Tablet but not Laptop is 12 : 7. The number of persons who like all the three gadgets is one-third of the number of persons who like Smartphone and Laptop but not Tablet. The number of persons who like only Laptop is 20 more than one-seventh of one-seventh of the total number of people who participated in the survey.

Q.48

How many persons like Smartphone and Tablet?

1 ☐ 88

2 ☐ 77

3 ☐ 33

4 ☐ 11

Solution:

Correct Answer : 1

Bookmark

Answer key/Solution

Total number of persons surveyed = 735.

From the information given, number of persons who like only

$$\text{laptop} = 20 + \frac{1}{7} \times \frac{1}{7} \times 735 = 35.$$

Number of persons who like only tablet = $4 \times 35 - 8 = 132$.

Let the number of persons who like all three gadgets be x .

$$\text{Also, } \frac{132}{y} = \frac{12}{7} \Rightarrow y = 77$$

$$(3x + x) = \frac{8}{10} (x + a)$$

$$\Rightarrow a = 4x \quad \dots (i)$$

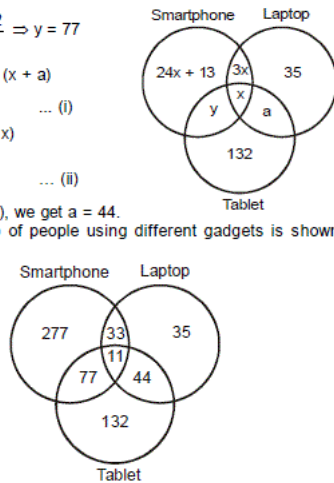
$$y + x = 2(3x + x)$$

$$\Rightarrow y = 7x$$

$$\Rightarrow x = 11 \quad \dots (ii)$$

From (i) and (ii), we get $a = 44$.

Final break-up of people using different gadgets is shown below:



Number of persons who like Smartphone and Tablet
 $= 77 + 11 = 88$.

FeedBack

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

A survey was conducted by an agency named Darpan AX Ltd in a city among 735 people to gauge the popularity of three electronic gadgets – Smartphone, Laptop and Tablet. The number of persons who like Smartphone and Laptop is 20% less than the number of persons who like Tablet and Laptop. The number of persons who like only Smartphone is 13 more than 24 times the number of persons who like all the three gadgets. The number of persons who like only Tablet is 8 less than four times of the number of persons who like only Laptop. The number of persons who like Smartphone and Tablet is double the number of persons who like Smartphone and Laptop. The ratio of the number of persons who like only Tablet to that of those who like Smartphone and Tablet but not Laptop is 12 : 7. The number of persons who like all the three gadgets is one-third of the number of persons who like Smartphone and Laptop but not Tablet. The number of persons who like only Laptop is 20 more than one-seventh of one-seventh of the total number of people who participated in the survey.

Q.49

How many persons like either Smartphone or Laptop but not both?

1 ☐ 555

2 ☐ 470

3 ☐ 433

4 ☐ 455

Solution:

Correct Answer : 3

Bookmark

Answer key/Solution

Total number of persons surveyed = 735.

From the information given, number of persons who like only

$$\text{laptop} = 20 + \frac{1}{7} \times \frac{1}{7} \times 735 = 35.$$

Number of persons who like only tablet = $4 \times 35 - 8 = 132$.

Let the number of persons who like all three gadgets be x .

$$\text{Also, } \frac{132}{y} = \frac{12}{7} \Rightarrow y = 77$$

$$(3x + x) = \frac{8}{10} (x + a)$$

$$\Rightarrow a = 4x \quad \dots (i)$$

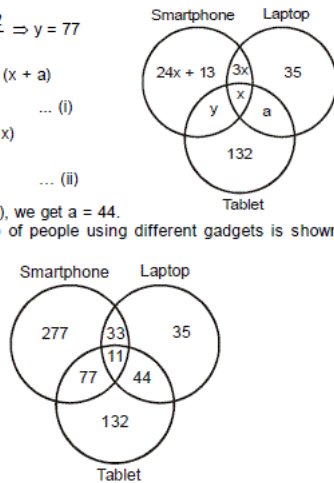
$$y + x = 2(3x + x)$$

$$\Rightarrow y = 7x$$

$$\Rightarrow x = 11 \quad \dots (ii)$$

From (i) and (ii), we get $a = 44$.

Final break-up of people using different gadgets is shown below:



Number of persons who like either Smartphone or Laptop but not both = $277 + 77 + 35 + 44 = 433$.

FeedBack

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

A survey was conducted by an agency named Darpan AX Ltd in a city among 735 people to gauge the popularity of three electronic gadgets – Smartphone, Laptop and Tablet. The number of persons who like Smartphone and Laptop is 20% less than the number of persons who like Tablet and Laptop. The number of persons who like only Smartphone is 13 more than 24 times the number of persons who like all the three gadgets. The number of persons who like only Tablet is 8 less than four times the number of persons who like only Laptop. The number of persons who like Smartphone and Tablet is double the number of persons who like Smartphone and Laptop. The ratio of the number of persons who like only Tablet to that of those who like Smartphone and Tablet but not Laptop is 12 : 7. The number of persons who like all the three gadgets is one-third of the number of persons who like Smartphone and Laptop but not Tablet. The number of persons who like only Laptop is 20 more than one-seventh of one-seventh of the total number of people who participated in the survey.

Q.50

What is the number of persons who do not like any of the three gadgets?

1 ☐ 0

2 ☐ 100

3 ☐ 80

4 ☐ 126

Solution:

Correct Answer : 4

Bookmark

Answer key/Solution

Total number of persons surveyed = 735.

From the information given, number of persons who like only

$$\text{laptop} = 20 + \frac{1}{7} \times \frac{1}{7} \times 735 = 35.$$

Number of persons who like only tablet = $4 \times 35 - 8 = 132$.

Let the number of persons who like all three gadgets be x .

$$\text{Also, } \frac{132}{y} = \frac{12}{7} \Rightarrow y = 77$$

$$(3x + x) = \frac{8}{10} (x + a)$$

$$\Rightarrow a = 4x \quad \dots (i)$$

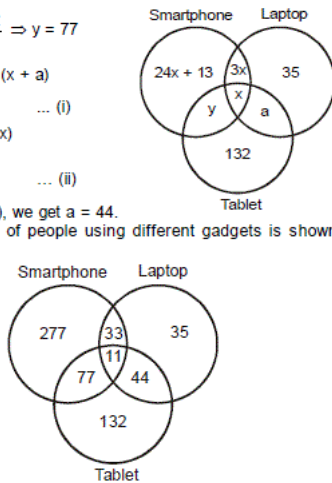
$$y + x = 2(3x + x)$$

$$\Rightarrow y = 7x$$

$$\Rightarrow x = 11 \quad \dots (ii)$$

From (i) and (ii), we get $a = 44$.

Final break-up of people using different gadgets is shown below:



Number of persons who do not like any of the three gadgets = $735 - (277 + 77 + 11 + 33 + 44 + 35 + 132) = 126$.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

In a multiplex, there are 3 screens namely S1, S2 and S3. The seating capacity of S1, S2 and S3 is 120, 135 and 95 respectively. On a day, the owner of the multiplex decided to have shows on five different movies – M1, M2, M3, M4 and M5. The lengths (in min) of these movies are 90, 120, 125, 150 and 180, not necessarily in the same order. Only one movie can be shown on a screen at a given time. The cinema owner wants to optimize usage of the screens. On each screen, shows can be held between 12 noon to 9 pm. The ticket prices of the given movies are Rs. 120, Rs. 125, Rs. 160, Rs. 100, and Rs. 180, not necessarily in the same order. Multiple shows of the given movies can be run as per the availability of screens. It is also known that:

- (1) For no movie, the absolute values of the length (in minutes) and the price (in Rs.) were the same. The length of M1 is a multiple of 45.
- (2) The prices of the ticket of movies the lengths of which are in an Arithmetic Progression are Rs. 120, Rs. 160 and Rs. 180, in any order.
- (3) The price of ticket of M2 is Rs. 100.
- (4) The price of ticket of M4 is not a multiple of 20.
- (5) The length of the movie the ticket of which is priced at Rs.160 is not a multiple of 4.
- (6) The length of M1 as well as M5 is a multiple of 60.
- (7) At least one show of each of the given movies was run on the given day.

Q.51

If total occupancy rate of the multiplex on the given day was 80%, the maximum amount (in Rs.) that the multiplex can earn in the form of selling tickets is

1 ☐ 187325

2 ☐ 192725

3 ☐ 193875

4 ☐ 210950

Solution:

Correct Answer : 4

Bookmark

Answer key/Solution

According to the conditions (1) and (6), length of M1 is a multiple of 45 as well as 60. Hence, length of M1 is 180 and the length of M5 is 120.

The lengths of three movies are in Arithmetic Progression and thus, their prices are Rs. 120, Rs. 160 and Rs. 180 in any order. So, movies of length 125 cannot be a part of the progression. Hence, price of ticket of movies with length 125 can only be Rs. 100.

According to condition (3), price of ticket of M2 is Rs.100. So, length of M2 is 125.

According to condition (5), length of movie whose ticket price is Rs.160 can be either 90 or 150.

According to (4), price of ticket of M4 is Rs.125.

Further analysis leads to the following table.

Movie	Length	Price(in Rs.)
M1	180	120
M2	125	100
M3	150	160
M4	90	125
M5	120	180

Total occupancy rate of the multiplex on the given day is 80%, i.e. 280.

Following arrangement is possible to maximize the amount (in Rs.) that the multiplex can earn in the form of selling tickets.

Movies	Screen		
	Show timing between 12 noon to 9 pm		
	S1(120)	S2(135)	S3(25)
M1			12 – 3
M2			3 – 5 : 05
M3			5 : 05 – 7 : 35
M4	6 – 7 : 30 7 : 30 – 9	6 – 7 : 30 7 : 30 – 9	
M5	12 – 2 2 – 4 4 – 6	12 – 2 2 – 4 4 – 6	

Required amount = $(120 \times 2 \times 125) + (120 \times 3 \times 180) + (135 \times 2 \times 125) + (135 \times 3 \times 180) + 25 \times (120 + 100 + 160)$
 $= 94800 + 106650 + 9500 = \text{Rs. } 210950.$

Feedback

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

In a multiplex, there are 3 screens namely S1, S2 and S3. The seating capacity of S1, S2 and S3 is 120, 135 and 95 respectively. On a day, the owner of the multiplex decided to have shows on five different movies – M1, M2, M3, M4 and M5. The lengths (in min) of these movies are 90, 120, 125, 150 and 180, not necessarily in the same order. Only one movie can be shown on a screen at a given time. The cinema owner wants to optimize usage of the screens. On each screen, shows can be held between 12 noon to 9 pm. The ticket prices of the given movies are Rs. 120, Rs. 125, Rs. 160, Rs. 100, and Rs. 180, not necessarily in the same order. Multiple shows of the given movies can be run as per the availability of screens. It is also known that:

- (1) For no movie, the absolute values of the length (in minutes) and the price (in Rs.) were the same. The length of M1 is a multiple of 45.
- (2) The prices of the ticket of movies the lengths of which are in an Arithmetic Progression are Rs. 120, Rs. 160 and Rs. 180, in any order.
- (3) The price of ticket of M2 is Rs. 100.
- (4) The price of ticket of M4 is not a multiple of 20.
- (5) The length of the movie the ticket of which is priced at Rs.160 is not a multiple of 4.
- (6) The length of M1 as well as M5 is a multiple of 60.
- (7) At least one show of each of the given movies was run on the given day.

Q.52

If the multiplex maximized its revenue through sales of tickets with 100% occupancy, on the given day, which of the following movies could not be shown on S2?

1 ☐ M1, M3 and M5

2 ☐ M1 and M2

3 ☐ M1, M2 and M3

4 ☐ M4 and M5

Solution:

Correct Answer : 3

Bookmark

Answer key/Solution

According to the conditions (1) and (6), length of M1 is a multiple of 45 as well as 60. Hence, length of M1 is 180 and the length of M5 is 120.

The lengths of three movies are in Arithmetic Progression and thus, their prices are Rs. 120, Rs. 160 and Rs. 180 in any order. So, movies of length 125 cannot be a part of the progression. Hence, price of ticket of movies with length 125 can only be Rs. 100.

According to condition (3), price of ticket of M2 is Rs.100. So, length of M2 is 125.

According to condition (5), length of movie whose ticket price is Rs.160 can be either 90 or 150.

According to (4), price of ticket of M4 is Rs.125.

Further analysis leads to the following table.

Movie	Length	Price(in Rs.)
M1	180	120
M2	125	100
M3	150	160
M4	90	125
M5	120	180

Movies	Screen		
	Show timing between 12 noon to 9 pm		
	S1(120)	S2(135)	S3(95)
M1			12 – 3
M2			3 – 5 : 05
M3			5 : 05 – 7 : 35
M4	6 – 7 : 30 7 : 30 – 9	6 – 7 : 30 7 : 30 – 9	
M5	12 – 2 2 – 4 4 – 6	12 – 2 2 – 4 4 – 6	

The required movies are M1, M2 and M3.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

In a multiplex, there are 3 screens namely S1, S2 and S3. The seating capacity of S1, S2 and S3 is 120, 135 and 95 respectively. On a day, the owner of the multiplex decided to have shows on five different movies – M1, M2, M3, M4 and M5. The lengths (in min) of these movies are 90, 120, 125, 150 and 180, not necessarily in the same order. Only one movie can be shown on a screen at a given time. The cinema owner wants to optimize usage of the screens. On each screen, shows can be held between 12 noon to 9 pm. The ticket prices of the given movies are Rs. 120, Rs. 125, Rs. 160, Rs. 100, and Rs. 180, not necessarily in the same order. Multiple shows of the given movies can be run as per the availability of screens. It is also known that:

- (1) For no movie, the absolute values of the length (in minutes) and the price (in Rs.) were the same. The length of M1 is a multiple of 45.
- (2) The prices of the ticket of movies the lengths of which are in an Arithmetic Progression are Rs. 120, Rs. 160 and Rs. 180, in any order.
- (3) The price of ticket of M2 is Rs. 100.
- (4) The price of ticket of M4 is not a multiple of 20.
- (5) The length of the movie the ticket of which is priced at Rs.160 is not a multiple of 4.
- (6) The length of M1 as well as M5 is a multiple of 60.
- (7) At least one show of each of the given movies was run on the given day.

Q.53

What is the length (in min) of M5?

1 ☐ 120

2 ☐ 180

3 ☐ 125

4 ☐ 90

Solution:

Correct Answer : 1

Bookmark

Answer key/Solution

According to the conditions (1) and (6), length of M1 is a multiple of 45 as well as 60. Hence, length of M1 is 180 and the length of M5 is 120.

The lengths of three movies are in Arithmetic Progression and thus, their prices are Rs. 120, Rs. 160 and Rs. 180 in any order. So, movies of length 125 cannot be a part of the progression. Hence, price of ticket of movies with length 125 can only be Rs. 100.

According to condition (3), price of ticket of M2 is Rs.100. So, length of M2 is 125.

According to condition (5), length of movie whose ticket price is Rs.160 can be either 90 or 150.

According to (4), price of ticket of M4 is Rs.125.

Further analysis leads to the following table.

Movie	Length	Price(in Rs.)
M1	180	120
M2	125	100
M3	150	160
M4	90	125
M5	120	180

120 minutes.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

In a multiplex, there are 3 screens namely S1, S2 and S3. The seating capacity of S1, S2 and S3 is 120, 135 and 95 respectively. On a day, the owner of the multiplex decided to have shows on five different movies – M1, M2, M3, M4 and M5. The lengths (in min) of these movies are 90, 120, 125, 150 and 180, not necessarily in the same order. Only one movie can be shown on a screen at a given time. The cinema owner wants to optimize usage of the screens. On each screen, shows can be held between 12 noon to 9 pm. The ticket prices of the given movies are Rs. 120, Rs. 125, Rs. 160, Rs. 100, and Rs. 180, not necessarily in the same order. Multiple shows of the given movies can be run as per the availability of screens. It is also known that:

- (1) For no movie, the absolute values of the length (in minutes) and the price (in Rs.) were the same. The length of M1 is a multiple of 45.
- (2) The prices of the ticket of movies the lengths of which are in an Arithmetic Progression are Rs. 120, Rs. 160 and Rs. 180, in any order.
- (3) The price of ticket of M2 is Rs. 100.
- (4) The price of ticket of M4 is not a multiple of 20.
- (5) The length of the movie the ticket of which is priced at Rs.160 is not a multiple of 4.
- (6) The length of M1 as well as M5 is a multiple of 60.
- (7) At least one show of each of the given movies was run on the given day.

Q.54

If the multiplex maximizes its revenue through sales of tickets with a total occupancy rate of 70% on the given day, what is the list of movies that could not be shown on S3?

- 1 ☐ M1 and M2
- 2 ☐ M3 and M4
- 3 ☐ M4 and M5
- 4 ☐ M1, M2 and M3

Solution:

Correct Answer : 3

 **Bookmark**

 **Answer key/Solution**

According to the conditions (1) and (6), length of M1 is a multiple of 45 as well as 60. Hence, length of M1 is 180 and the length of M5 is 120.

The lengths of three movies are in Arithmetic Progression and thus, their prices are Rs. 120, Rs. 160 and Rs. 180 in any order. So, movies of length 125 cannot be a part of the progression. Hence, price of ticket of movies with length 125 can only be Rs. 100.

According to condition (3), price of ticket of M2 is Rs.100. So, length of M2 is 125.

According to condition (5), length of movie whose ticket price is Rs.160 can be either 90 or 150.

According to (4), price of ticket of M4 is Rs.125.

Further analysis leads to the following table.

Movie	Length	Price(in Rs.)
M1	180	120
M2	125	100
M3	150	160
M4	90	125
M5	120	180

Movies	Screen		
	Show timing between 12 noon to 9 pm		
	S1(109)	S2(135)	S3(1)
M1			12 – 3
M2			3 – 5 : 05
M3			5 : 05 – 7 : 35
M4	6 – 7 : 30 7 : 30 – 9	6 – 7 : 30 7 : 30 – 9	
M5	12 – 2 2 – 4 4 – 6	12 – 2 2 – 4 4 – 6	

M4 and M5 cannot be shown on S3 under the given conditions.

FeedBack

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

Ekta, a visiting professor of Mathematics in Delhi University, delivered lectures in five different colleges namely A, B, C, D and E, between 1st March, 2017 and 3rd April 2017. On 17th March 2017, when her friend Wasim enquired about the schedule of lectures, the following were her replies:

- "My first lecture in colleges A, B, C, D and E was on 1st, 2nd, 3rd, 4th and 5th March respectively.
- In each college, I delivered at least one lecture every 7 days but did not deliver lectures on two consecutive days. And the same will hold true for the remaining period."

On 28th March, when Wasim asked about the schedule of the lectures, she told to Wasim that she will deliver her lecture in college E, D, C, B and A on 29th March, 30th March, 31st March, 1st April and 3rd April respectively.

It is also known that the number of days between any two consecutive lectures taken by Ekta in a college was the same.

Q.55

If Ekta delivered a lecture in college C on March 10, 2017, on what date of March did she deliver her fourth lecture in same college?

Fill 1 if "your answer is 22"

Fill 2 if "your answer is 17"

Fill 3 if "your answer is 24"

Fill 4 if "your answer is 31"



Solution:

Correct Answer : 3

Your Answer : 3

Bookmark

Answer key/Solution

It is given that:

- (i) In each college, she took at least one lecture every 7 days.
- (ii) In no college, she took lectures on two consecutive days.
- (iii) In each college, the number of days between two consecutive lectures is the same.

It can be noted that the first and last lectures in college A was on 1st March and 3rd April respectively. The number of days starting from 2nd March to 3rd April is 33. If N lectures were taken by her in college A in the given 33 days, N must be a factor of 33 (i.e. 1, 3, 11, 33) lying between 2 and 7, both inclusive. Thus, the value that N can take is only 3. Hence, in college A, she took lectures every 3rd day.

The first and last lectures in college B was on 2nd March and 1st April respectively. The number of days starting from 3rd March to 1st April is 30. If N lectures were taken by her in college B in the given 30 days, N must be a factor of 30 (i.e. 1, 2, 3, 5, 6, 10, 15, 30) lying between 2 and 7, both inclusive. Thus, the values that N can take are 2, 3, 5 and 6. Hence, in college B, she took lectures either every 2nd day, every 3rd day, every 5th day or every 6th day.

Similarly, in college C, she took lectures either every 2nd day, every 4th day or every 7th day; in college D, she took lectures every 2nd day; and in college E, she took lectures either every 2nd day, every 3rd day, every 4th day or every 6th day.

According to the given information, it can be concluded that in college C she took lectures every 7th day. Hence, in college C, she took her 4th lecture on 24th March.

FeedBack

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

Ekta, a visiting professor of Mathematics in Delhi University, delivered lectures in five different colleges namely A, B, C, D and E, between 1st March, 2017 and 3rd April 2017. On 17th March 2017, when her friend Wasim enquired about the schedule of lectures, the following were her replies:

- "My first lecture in colleges A, B, C, D and E was on 1st, 2nd, 3rd, 4th and 5th March respectively.
- In each college, I delivered at least one lecture every 7 days but did not deliver lectures on two consecutive days. And the same will hold true for the remaining period."

On 28th March, when Wasim asked about the schedule of the lectures, she told to Wasim that she will deliver her lecture in college E, D, C, B and A on 29th March, 30th March, 31st March, 1st April and 3rd April respectively.

It is also known that the number of days between any two consecutive lectures taken by Ekta in a college was the same.

Q.56

The number of lectures delivered by Ekta in the five colleges put together in March could not be more than

Fill 1 if "your answer is 65"

Fill 2 if "your answer is 68"

Fill 3 if "your answer is 70"

Fill 4 if "your answer is 72"

✖

Solution:

Correct Answer : 2

Your Answer : 3

Bookmark

Answer key/Solution

It is given that:

- (i) In each college, she took at least one lecture every 7 days.
- (ii) In no college, she took lectures on two consecutive days.
- (iii) In each college, the number of days between two consecutive lectures is the same.

It can be noted that the first and last lectures in college A was on 1st March and 3rd April respectively. The number of days starting from 2nd March to 3rd April is 33. If N lectures were taken by her in college A in the given 33 days, N must be a factor of 33 (i.e. 1, 3, 11, 33) lying between 2 and 7, both inclusive. Thus, the value that N can take is only 3. Hence, in college A, she took lectures every 3rd day.

The first and last lectures in college B was on 2nd March and 1st April respectively. The number of days starting from 3rd March to 1st April is 30. If N lectures were taken by her in college B in the given 30 days, N must be a factor of 30 (i.e. 1, 2, 3, 5, 6, 10, 15, 30) lying between 2 and 7, both inclusive. Thus, the values that N can take are 2, 3, 5 and 6. Hence, in college B, she took lectures either every 2nd day, every 3rd day, every 5th day or every 6th day.

Similarly, in college C, she took lectures either every 2nd day, every 4th day or every 7th day; in college D, she took lectures every 2nd day; and in college E, she took lectures either every 2nd day, every 3rd day, every 4th day or every 6th day.

In order to maximise the number of lectures taken by her, the frequency of lectures in the given colleges must be highest possible. Thus, in colleges A, B, C, D and E, she took lectures every 3rd, 2nd, 2nd, 2nd and 2nd day respectively.

Hence, the required number of lectures
 $= 11 + 15 + 15 + 14 + 13 = 68$.

FeedBack

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

Ekta, a visiting professor of Mathematics in Delhi University, delivered lectures in five different colleges namely A, B, C, D and E, between 1st March, 2017 and 3rd April 2017. On 17th March 2017, when her friend Wasim enquired about the schedule of lectures, the following were her replies:

- "My first lecture in colleges A, B, C, D and E was on 1st, 2nd, 3rd, 4th and 5th March respectively.
- In each college, I delivered at least one lecture every 7 days but did not deliver lectures on two consecutive days. And the same will hold true for the remaining period."

On 28th March, when Wasim asked about the schedule of the lectures, she told to Wasim that she will deliver her lecture in college E, D, C, B and A on 29th March, 30th March, 31st March, 1st April and 3rd April respectively.

It is also known that the number of days between any two consecutive lectures taken by Ekta in a college was the same.

Q.57

For how many colleges is it possible to determine uniquely the number of lectures delivered by her in March?

Fill 1 if "your answer is 2"

Fill 2 if "your answer is 3"

Fill 3 if "your answer is 4"

Fill 4 if "your answer is 5"

Solution:

Correct Answer : 1

It is given that:

- (i) In each college, she took at least one lecture every 7 days.
- (ii) In no college, she took lectures on two consecutive days.
- (iii) In each college, the number of days between two consecutive lectures is the same.

It can be noted that the first and last lectures in college A was on 1st March and 3rd April respectively. The number of days starting from 2nd March to 3rd April is 33. If N lectures were taken by her in college A in the given 33 days, N must be a factor of 33 (i.e. 1, 3, 11, 33) lying between 2 and 7, both inclusive. Thus, the value that N can take is only 3. Hence, in college A, she took lectures every 3rd day.

The first and last lectures in college B was on 2nd March and 1st April respectively. The number of days starting from 3rd March to 1st April is 30. If N lectures were taken by her in college B in the given 30 days, N must be a factor of 30 (i.e. 1, 2, 3, 5, 6, 10, 15, 30) lying between 2 and 7, both inclusive. Thus, the values that N can take are 2, 3, 5 and 6. Hence, in college B, she took lectures either every 2nd day, every 3rd day, every 5th day or every 6th day.

Similarly, in college C, she took lectures either every 2nd day, every 4th day or every 7th day; in college D, she took lectures every 2nd day; and in college E, she took lectures either every 2nd day, every 3rd day, every 4th day or every 6th day.

For two colleges viz. A and D, the number of lectures delivered by her can be determined uniquely.

Bookmark

Answer key/Solution

FeedBack

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

Ekta, a visiting professor of Mathematics in Delhi University, delivered lectures in five different colleges namely A, B, C, D and E, between 1st March, 2017 and 3rd April 2017. On 17th March 2017, when her friend Wasim enquired about the schedule of lectures, the following were her replies:

- "My first lecture in colleges A, B, C, D and E was on 1st, 2nd, 3rd, 4th and 5th March respectively.
- In each college, I delivered at least one lecture every 7 days but did not deliver lectures on two consecutive days. And the same will hold true for the remaining period."

On 28th March, when Wasim asked about the schedule of the lectures, she told to Wasim that she will deliver her lecture in college E, D, C, B and A on 29th March, 30th March, 31st March, 1st April and 3rd April respectively.

It is also known that the number of days between any two consecutive lectures taken by Ekta in a college was the same.

Q.58

The number of lectures delivered by Ekta in the five colleges put together in March could not be less than

Fill 1 if "your answer is 41"

Fill 2 if "your answer is 37"

Fill 3 if "your answer is 40"

Fill 4 if "your answer is 42"

Solution:

Correct Answer : 3

It is given that:

- In each college, she took at least one lecture every 7 days.
- In no college, she took lectures on two consecutive days.
- In each college, the number of days between two consecutive lectures is the same.

It can be noted that the first and last lectures in college A was on 1st March and 3rd April respectively. The number of days starting from 2nd March to 3rd April is 33. If N lectures were taken by her in college A in the given 33 days, N must be a factor of 33 (i.e. 1, 3, 11, 33) lying between 2 and 7, both inclusive. Thus, the value that N can take is only 3. Hence, in college A, she took lectures every 3rd day.

The first and last lectures in college B was on 2nd March and 1st April respectively. The number of days starting from 3rd March to 1st April is 30. If N lectures were taken by her in college D in the given 30 days, N must be a factor of 30 (i.e. 1, 2, 3, 5, 6, 10, 15, 30) lying between 2 and 7, both inclusive. Thus, the values that N can take are 2, 3, 5 and 6. Hence, in college B, she took lectures either every 2nd day, every 3rd day, every 5th day or every 6th day.

Similarly, in college C, she took lectures either every 2nd day, every 4th day or every 7th day; in college D, she took lectures every 2nd day; and in college E, she took lectures either every 2nd day, every 3rd day, every 4th day or every 6th day.

In order to minimise the number of lectures taken by her, the frequency of lectures in the given colleges must be least possible. Thus, in colleges A, B, C, D and E, she took lectures every 3rd, 6th, 7th, 2nd and 6th day respectively.

Hence, the required number of lectures = $11 + 5 + 5 + 14 + 5 = 40$.

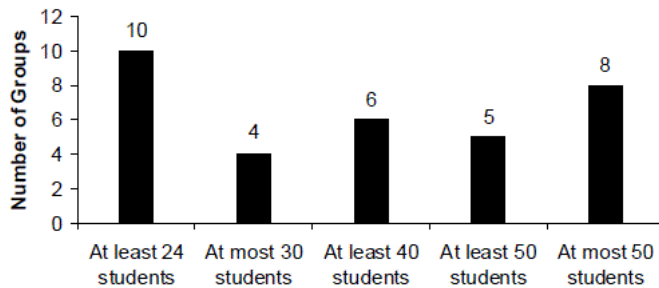
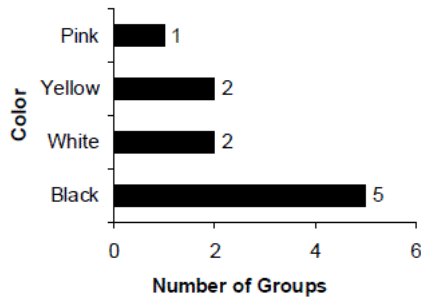
FeedBack

Bookmark

Answer key/Solution

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

The students of the schools are divided into 10 groups namely G1, G2, G3, ..., G10. All members of each group are wearing dresses of the same colour. The color of dresses for each group is one out of the four colors namely Black, White, Yellow and Pink. The number of students in each of these ten groups is one of the five numbers 24, 30, 40, 50 and 60. The following bar graphs provide information about the number of groups wearing dresses of given colours and about the number of groups that have different number of students. It is also known that no two groups wearing dresses of the same color have an equal number of students.



Q.59

What is the total number of students in all the groups, taken together, wearing black colored dresses?

1 ☐ 2042 ☐ 1843 ☐ 1904 ☐ 210

Solution:

Correct Answer : 1

Your Answer : 1

The number of groups wearing Pink, Yellow, White and Black coloured dresses is 1, 2, 2 and 5 respectively.

It is also given that no two groups wearing same colored dresses have an equal number of students.

It is also given that the number of students in each of the ten groups is one among 24, 30, 40, 50 or 60.

Also, since there are five groups wearing black colored dresses, the number of students in these groups has to be 24, 30, 40, 50 or 60.

From the second bar chart, it can also be observed that the number of groups that have 60, 50, 40 and 30 or less students is 2, 3, 1 and 4 respectively.

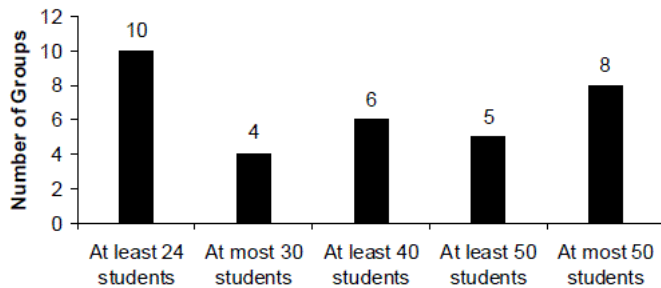
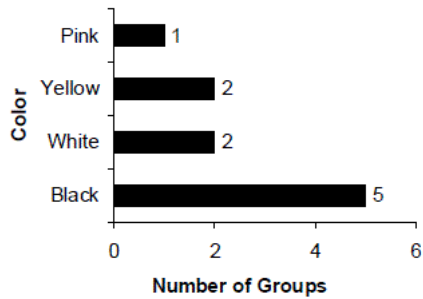
The derived conclusions can be tabulated as shown below:

Number of Students	Number of Groups
24	1 - 3
30	1 - 3
40	1
50	3
60	2

The total number of students in all the groups wearing black colored dresses = $24 + 30 + 40 + 50 + 60 = 204$.

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

The students of the schools are divided into 10 groups namely G1, G2, G3, ..., G10. All members of each group are wearing dresses of the same colour. The color of dresses for each group is one out of the four colors namely Black, White, Yellow and Pink. The number of students in each of these ten groups is one of the five numbers 24, 30, 40, 50 and 60. The following bar graphs provide information about the number of groups wearing dresses of given colours and about the number of groups that have different number of students. It is also known that no two groups wearing dresses of the same color have an equal number of students.



Q.60

The total number of students in all the ten groups put together is at most

1 ☐ 4042 ☐ 4143 ☐ 4244 ☐ 444**Solution:****Correct Answer : 3****Your Answer : 3**

The number of groups wearing Pink, Yellow, White and Black coloured dresses is 1, 2, 2 and 5 respectively.

It is also given that no two groups wearing same colored dresses have an equal number of students.

It is also given that the number of students in each of the ten groups is one among 24, 30, 40, 50 or 60.

Also, since there are five groups wearing black colored dresses, the number of students in these groups has to be 24, 30, 40, 50 or 60.

From the second bar chart, it can also be observed that the number of groups that have 60, 50, 40 and 30 or less students is 2, 3, 1 and 4 respectively.

The derived conclusions can be tabulated as shown below:

Number of Students	Number of Groups
24	1 - 3
30	1 - 3
40	1
50	3
60	2

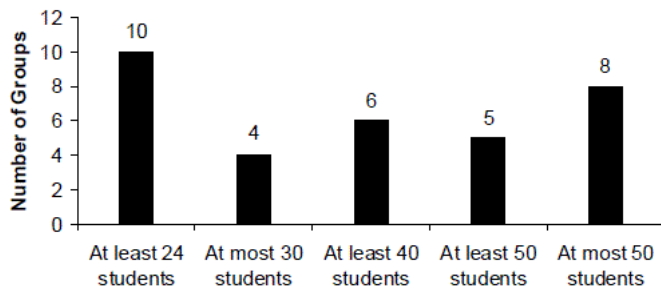
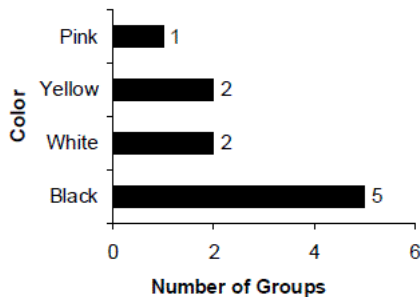
The total number of students will be maximum when there are 3 three groups that have 30 students each and there is only group that has 24 students.

Therefore, the total number of students is at most

$$= 1 \times 24 + 3 \times 30 + 1 \times 40 + 3 \times 50 + 2 \times 60 = 424.$$

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

The students of the schools are divided into 10 groups namely G1, G2, G3, ..., G10. All members of each group are wearing dresses of the same colour. The color of dresses for each group is one out of the four colors namely Black, White, Yellow and Pink. The number of students in each of these ten groups is one of the five numbers 24, 30, 40, 50 and 60. The following bar graphs provide information about the number of groups wearing dresses of given colours and about the number of groups that have different number of students. It is also known that no two groups wearing dresses of the same color have an equal number of students.



Q.61

If the number of students in the group wearing pink colored dresses is 60, then which of the following can be the total number of students in all the groups wearing white colored dresses?

1 ☐ 90

2 ☐ 74

3 ☐ 84

4 ☐ Both (1) and (2)



Solution:

Correct Answer : 2

Your Answer : 2

Bookmark

Answer key/Solution

The number of groups wearing Pink, Yellow, White and Black coloured dresses is 1, 2, 2 and 5 respectively.

It is also given that no two groups wearing same colored dresses have an equal number of students.

It is also given that the number of students in each of the ten groups is one among 24, 30, 40, 50 or 60.

Also, since there are five groups wearing black colored dresses, the number of students in these groups has to be 24, 30, 40, 50 or 60.

From the second bar chart, it can also be observed that the number of groups that have 60, 50, 40 and 30 or less students is 2, 3, 1 and 4 respectively.

The derived conclusions can be tabulated as shown below:

Number of Students	Number of Groups
24	1 - 3
30	1 - 3
40	1
50	3
60	2

We already know that the number of students in 5 groups wearing Black colour dresses is 24, 30, 40, 50 and 60.

Given that the number of students in the group wearing Pink coloured dresses is 60.

The number of groups wearing white colored dresses is 2.

The total number of students in the groups wearing White coloured dresses can be $(50 + 24 = 74)$,

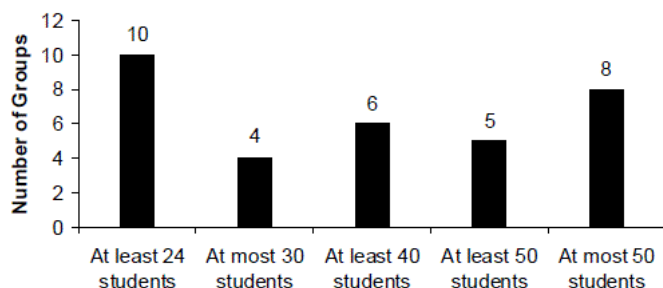
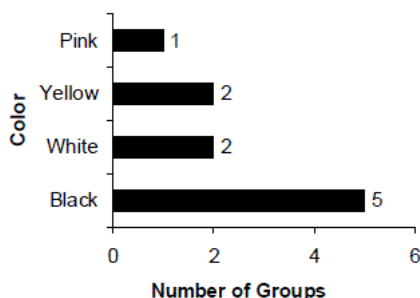
$(50 + 30 = 80)$ or $(24 + 30 = 54)$

Hence, option (2) is the correct choice.

FeedBack

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

The students of the schools are divided into 10 groups namely G1, G2, G3, ..., G10. All members of each group are wearing dresses of the same colour. The color of dresses for each group is one out of the four colors namely Black, White, Yellow and Pink. The number of students in each of these ten groups is one of the five numbers 24, 30, 40, 50 and 60. The following bar graphs provide information about the number of groups wearing dresses of given colours and about the number of groups that have different number of students. It is also known that no two groups wearing dresses of the same color have an equal number of students.



Q.62

If the total number of students in the groups wearing yellow colored dresses is the maximum possible and the total number of students in the ten groups put together is the least possible, then what is the number of students in the group wearing pink colored dresses?

1 ☐ 50

2 ☐ 60

3 ☐ 304 ☐ 24**Solution:****Correct Answer : 4****Your Answer : 4**

The number of groups wearing Pink, Yellow, White and Black coloured dresses is 1, 2, 2 and 5 respectively.

It is also given that no two groups wearing same colored dresses have an equal number of students.

It is also given that the number of students in each of the ten groups is one among 24, 30, 40, 50 or 60.

Also, since there are five groups wearing black colored dresses, the number of students in these groups has to be 24, 30, 40, 50 or 60.

From the second bar chart, it can also be observed that the number of groups that have 60, 50, 40 and 30 or less students is 2, 3, 1 and 4 respectively.

The derived conclusions can be tabulated as shown below:

Number of Students	Number of Groups
24	1 - 3
30	1 - 3
40	1
50	3
60	2

Given that the total number of students in the groups wearing Yellow colored dresses is maximum possible, which means the total number of students in the groups wearing Yellow colored dresses is $50 + 60 = 110$.

Also, since the total number of students in all the groups is the least, which means that the number of groups having 30 and 24 students is 1 and 3 respectively.

So, the only possibility left for the group wearing Pink colored dresses is 24 students, and the two groups wearing White coloured dresses have 50 and 24 students.

Bookmark

Answer key/Solution

Directions for questions 63 to 66: Answer the questions on the basis of the information given below.

Four friends, namely Akhilesh, Bhartendu, Champak and Deependra, went to a juice corner named Fresh Juice Point, which is known for its items namely Orange juice, Pomegranate juice, Guava juice and Mango juice, to have some juice. Further, information is as follows:

- Each of the four friends chose two juices out of the four juices and had two glasses of each of the juices chosen by him.
- No two friends chose the same combination of two juices. The price per glass of the four items was Rs. 20, Rs. 24, Rs. 16 and Rs. 22, not necessarily in the same order.
- When asked about their visit to the juice corner, each of the four friends made two statements, the details of which are as follows:

Akhilesh:

- Bhartendu spent a total of Rs. 92.
- Deependra spent a total of Rs. 80 and did not have Guava juice.

Bhartendu:

- The cost of a Pomegranate Juice was Rs. 24.
- Akhilesh spent a total of Rs. 72 and one of the juices that he had was the costliest out of the four juices.

Champak:

- Bhartendu spent the maximum possible amount at the juice corner.
- Deependra did not have Orange juice as well as Guava juice.

Deependra:

- I had Orange juice, the cost of which was Rs. 22 per glass.
- One of the juices that Akhilesh had was the costliest out of the four juices.

Later on, it was observed that out of the four friends, both the statements made by two of the friends were false, whereas both the statements made by the remaining two friends were true. If any statement made by any of the four friends gives more than one information, then all the information given in the statement is either true or false.

Q.63

If Akhilesh spent a total of Rs. 84, then which of the following juices Akhilesh had at the juice corner?

1 ☐ Guava Juice and Mango Juice

2 ☐ Guava Juice and Orange Juice

3 ☐ Orange Juice and Mango Juice

4 ☐ Pomegranate Juice and Mango Juice

Solution:

Correct Answer : 2

If we look at the 2nd statement of Bhartendu, then this statement cannot be true because if A had the costliest juice, then the total money spent by A should be

$$= (24 + 22) \times 2 = 92 \text{ or}$$

$$= (24 + 20) \times 2 = 88 \text{ or}$$

$$= (24 + 16) \times 2 = 80$$

Therefore, both parts of the 2nd statement of Bhartendu are false and thus the 1st statement of Bhartendu must also be false as all the information given in the statement of one friend is either true or false. Thus, the second statement of Deependra is also false.

Hence, both the statements made by Akhilesh and Champak must be true, which means that Bhartendu had juice costing Rs. 24 and Rs. 22 and he spent a total of Rs. 92.

According to Akhilesh and Champak, Deependra spent a total of Rs. 80. He had one glass of Pomegranate juice and one of Mango juice. Therefore, the total cost of a glass of Pomegranate juice and a glass of Mango juice is Rs. 40.

According to the first statement of Bhartendu, the cost of a Pomegranate Juice is not Rs. 24.

Therefore, the cost of one glass of Pomegranate juice is Rs. 16 while the cost of one glass of Mango juice is Rs. 24.

The cost of one of the juices taken by Bhartendu was Rs. 22.

This juice was not Orange juice because the cost of one glass of Orange juice is not Rs. 22, which means the cost of one glass of Orange juice is Rs. 20 while the cost of one glass of Guava juice is Rs. 22.

The conclusions above can be tabulated as

S.No	Name	Item 1	Item 2	Total value
1	Akhilesh			
2	Bhartendu	Mango juice	Guava juice	92
		24	22	
3	Champak			
4	Deependra	Pomegranate juice	Mango juice	80
		16	24	

Akhilesh can spend a total of Rs. 84 only if he had 2 glasses each of the juices costing Rs. 20 and Rs. 22. Hence, he had Orange Juice and Guava Juice.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 63 to 66: Answer the questions on the basis of the information given below.

Four friends, namely Akhilesh, Bhartendu, Champak and Deependra, went to a juice corner named Fresh Juice Point, which is known for its items namely Orange juice, Pomegranate juice, Guava juice and Mango juice, to have some juice. Further, information is as follows:

(i) Each of the four friends chose two juices out of the four juices and had two glasses of each of the juices chosen by him.

(ii) No two friends chose the same combination of two juices. The price per glass of the four items was Rs. 20, Rs. 24, Rs. 16 and Rs. 22, not necessarily in the same order.

(iii) When asked about their visit to the juice corner, each of the four friends made two statements, the details of which are as follows:

Akhilesh:

1. Bhartendu spent a total of Rs. 92.

2. Deependra spent a total of Rs. 80 and did not have Guava juice.

Bhartendu:

1. The cost of a Pomegranate Juice was Rs. 24.

2. Akhilesh spent a total of Rs. 72 and one of the juices that he had was the costliest out of the four juices.

Champak:

1. Bhartendu spent the maximum possible amount at the juice corner.

2. Deependra did not have Orange juice as well as Guava juice.

Deependra:

1. I had Orange juice, the cost of which was Rs. 22 per glass.

2. One of the juices that Akhilesh had was the costliest out of the four juices.

Later on, it was observed that out of the four friends, both the statements made by two of the friends were false, whereas both the statements made by the remaining two friends were true. If any statement made by any of the four friends gives more than one information, then all the information given in the statement is either true or false.

Q.64

How many friends, out of the four, had Mango juice at the juice corner?

- 1 ☐ 2
- 2 ☐ 3
- 3 ☐ 4
- 4 ☐ Cannot be determined

Solution:

Correct Answer : 4

If we look at the 2nd statement of Bhartendu, then this statement cannot be true because if A had the costliest juice, then the total money spent by A should be

$$= (24 + 22) \times 2 = 92 \text{ or}$$

$$= (24 + 20) \times 2 = 88 \text{ or}$$

$$= (24 + 16) \times 2 = 80$$

Therefore, both parts of the 2nd statement of Bhartendu are false and thus the 1st statement of Bhartendu must also be false as all the information given in the statement of one friend is either true or false. Thus, the second statement of Deependra is also false.

Hence, both the statements made by Akhilesh and Champak must be true, which means that Bhartendu had juice costing Rs. 24 and Rs. 22 and he spent a total of Rs. 92.

According to Akhilesh and Champak, Deependra spent a total of Rs. 80. He had one glass of Pomegranate juice and one of Mango juice. Therefore, the total cost of a glass of Pomegranate juice and a glass of Mango juice is Rs. 40.

According to the first statement of Bhartendu, the cost of a Pomegranate Juice is not Rs. 24.

Therefore, the cost of one glass of Pomegranate juice is Rs. 16 while the cost of one glass of Mango juice is Rs. 24.

The cost of one of the juices taken by Bhartendu was Rs. 22. This juice was not Orange juice because the cost of one glass of Orange juice is not Rs. 22, which means the cost of one glass of Orange juice is Rs. 20 while the cost of one glass of Guava juice is Rs. 22.

The conclusions above can be tabulated as

S.No	Name	Item 1	Item 2	Total value
1	Akhilesh			
2	Bhartendu	Mango juice	Guava juice	92
		24	22	
3	Champak			
4	Deependra	Pomegranate juice	Mango juice	80
		16	24	

From the table above, it is obvious that 2 people namely Bhartendu and Deependra definitely had Mango juice. Also, Akhilesh did not have Mango juice but we cannot say anything about Champak and therefore, either 2 friends or 3 friends would have had Mango juice. Hence, Cannot be determined is the correct choice.

FeedBack

 **Bookmark**

 **Answer key/Solution**

Directions for questions 63 to 66: Answer the questions on the basis of the information given below.

Four friends, namely Akhilesh, Bhartendu, Champak and Deependra, went to a juice corner named Fresh Juice Point, which is known for its items namely Orange juice, Pomegranate juice, Guava juice and Mango juice, to have some juice. Further, information is as follows:

- Each of the four friends chose two juices out of the four juices and had two glasses of each of the juices chosen by him.
- No two friends chose the same combination of two juices. The price per glass of the four items was Rs. 20, Rs. 24, Rs. 16 and Rs. 22, not necessarily in the same order.
- When asked about their visit to the juice corner, each of the four friends made two statements, the details of which are as follows:

Akhilesh:

- Bhartendu spent a total of Rs. 92.
- Deependra spent a total of Rs. 80 and did not have Guava juice.

Bhartendu:

- The cost of a Pomegranate Juice was Rs. 24.

2. Akhilesh spent a total of Rs. 72 and one of the juices that he had was the costliest out of the four juices.

Champak:

1. Bhartendu spent the maximum possible amount at the juice corner.
2. Deependra did not have Orange juice as well as Guava juice.

Deependra:

1. I had Orange juice, the cost of which was Rs. 22 per glass.
2. One of the juices that Akhilesh had was the costliest out of the four juices.

Later on, it was observed that out of the four friends, both the statements made by two of the friends were false, whereas both the statements made by the remaining two friends were true. If any statement made by any of the four friends gives more than one information, then all the information given in the statement is either true or false.

Q.65

If the total amount spent by Champak was more than that by Deependra, the juices consumed by Champak were

- 1 ☐ Orange juice and Mango juice
- 2 ☐ Orange juice and Pomegranate juice
- 3 ☐ Orange juice and Guava juice
- 4 ☐ Either (1) or (3)

FeedBack

Bookmark

Answer key/Solution

Directions for questions 63 to 66: Answer the questions on the basis of the information given below.

Four friends, namely Akhilesh, Bhartendu, Champak and Deependra, went to a juice corner named Fresh Juice Point, which is known for its items namely Orange juice, Pomegranate juice, Guava juice and Mango juice, to have some juice. Further, information is as follows:

- (i) Each of the four friends chose two juices out of the four juices and had two glasses of each of the juices chosen by him.
- (ii) No two friends chose the same combination of two juices. The price per glass of the four items was Rs. 20, Rs. 24, Rs. 16 and Rs. 22, not necessarily in the same order.
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1. The cost of a Pomegranate Juice was Rs. 24.
2. Akhilesh spent a total of Rs. 72 and one of the juices that he had was the costliest out of the four juices.

Champak:

1. Bhartendu spent the maximum possible amount at the juice corner.
2. Deependra did not have Orange juice as well as Guava juice.

Deependra:

1. I had Orange juice, the cost of which was Rs. 22 per glass.
2. One of the juices that Akhilesh had was the costliest out of the four juices.

Later on, it was observed that out of the four friends, both the statements made by two of the friends were false, whereas both the statements made by the remaining two friends were true. If any statement made by any of the four friends gives more than one information, then all the information given in the statement is either true or false.

Q.66

The total amount spent by the four friends put together at the juice corner could not be more than

- 1 ☐ Rs. 340
- 2 ☐ Rs. 344
- 3 ☐ Rs. 336
- 4 ☐ Rs. 332

Solution:

Correct Answer : 2

Bookmark

If we look at the 2nd statement of Bhartendu, then this statement cannot be true because if A had the costliest juice, then the total money spent by A should be

$$= (24 + 22) \times 2 = 92 \text{ or}$$

$$= (24 + 20) \times 2 = 88 \text{ or}$$

$$= (24 + 16) \times 2 = 80$$

Therefore, both parts of the 2nd statement of Bhartendu are false and thus the 1st statement of Bhartendu must also be false as all the information given in the statement of one friend is either true or false. Thus, the second statement of Deependra is also false.

Hence, both the statements made by Akhilesh and Champak must be true, which means that Bhartendu had juice costing Rs. 24 and Rs. 22 and he spent a total of Rs. 92.

According to Akhilesh and Champak, Deependra spent a total of Rs. 80. He had one glass of Pomegranate juice and one of Mango juice. Therefore, the total cost of a glass of Pomegranate juice and a glass of Mango juice is Rs. 40.

According to the first statement of Bhartendu, the cost of a Pomegranate Juice is not Rs. 24.

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The conclusions above can be tabulated as

S.No	Name	Item 1	Item 2	Total value
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2	Bhartendu	Mango juice	Guava juice	92
		24	22	
3	Champak			
4	Deependra	Pomegranate juice	Mango juice	80
		16	24	

The amount spent by two of the friends is already known, which is given in the table and add upto Rs. 172. If we want to maximise the total amount spent, Akhilesh must have had 2 glasses of each of Orange juice and Guava juice which add upto Rs. 84, and Champak must have had Mango juice and Orange juice which will add upto Rs. 88.

Maximum money that could be spent
= Rs. (80 + 92 + 84 + 88) = Rs.344.

FeedBack

 Answer key/Solution

Sec 3

Q.67

Two cities P and Q are 1200 km apart. At 9 a.m., a Volvo leaves P for Q and an Armada leaves Q for P. Volvo covers one-third the distance at a speed of 80 km/hr, half the remaining distance at 100 km/hr and the rest at 120 km/hr. Armada completes the journey by travelling at 80 km/hr, 100 km/hr and 120 km/hr respectively for equal intervals of time. When and where will the two vehicles cross each other?

- 1 ☐ At 5:08 p.m. and 610 km from P
- 2 ☐ At 3:54 p.m. and 610 km from Q
- 3 ☐ At 4:00 p.m. and 590 km from P
- 4 ☐ At 3:00 p.m. and 610 km from Q

Solution:

Correct Answer : 2

 Bookmark

 Answer key/Solution

Let the time for which Armada travels at 80 km/hr, 100 km/hr and 120 km/hr be 't' hrs each.
 $\therefore 80t + 120t + 100t = 1200 \Rightarrow t = 4$ hrs
 Time taken by Volvo to travel one-third of the distance
 $= \frac{400}{80} = 5$ hrs.
 Distance traveled by Armada in 5 hrs
 $= 80 \times 4 + 100 \times 1$
 $= 420$ km
 \therefore Distance between Armada and Volvo after 5 hrs
 $= 1200 - (420 + 400) = 380$ km
 \therefore Time after which they meet
 $= 5 + \frac{380}{100 + 100} = 6$ hrs 54 minutes.
 \therefore Distance traveled by Armada in 6 hrs 54 minutes
 $= 420 + 100 \times (1.9) = 610$ km
 Hence, they meet at 3:54 p.m. at a point which is 610 km from Q.

FeedBack

Q.68

For how many days in a year, will the sum of the day number (1 to 28/30/31, depending upon the month) and the square root of the month number give the same value as the square of the same month number?



Solution:

Correct Answer : 1

Your Answer : 1

This is possible if and only if the month number is a perfect square. Hence, this is possible either in January, April or September. Square of these months will be January – 1, April – 16, and September – 81 respectively. Thus, possible dates will be 0 January, 14 April and 78 September. Out of these only 14 April is a permissible date.

FeedBack

Bookmark

Answer key/Solution

Q.69

In triangle ABC, E and F are points on the sides AB and AC respectively. The line segments EF and BC are extended to meet at a point D. If $AE = AF$, $CD = 2BC$ and $CF = 1.5$ cm, then find the length (in cm) of BE.

1 ☐ 3

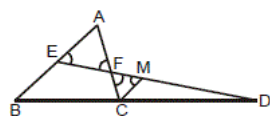
2 ☐ 4.5

3 ☐ 2.75

4 ☐ 2.25

Solution:

Correct Answer : 4



Draw line CM parallel to BA.

$\therefore \angle AFE = \angle CFM$

and $\angle FMC = \angle FEA$

Thus, $\angle CFM = \angle FMC$

$\Rightarrow CF = CM = 1.5$ cm

Now, $\triangle DBE \sim \triangle DCM$

$$\therefore \frac{DC}{BD} = \frac{CM}{BE}$$

$$\Rightarrow \frac{2}{3} = \frac{1.5}{BE} \Rightarrow BE = 2.25 \text{ cm.}$$

FeedBack

Bookmark

Answer key/Solution

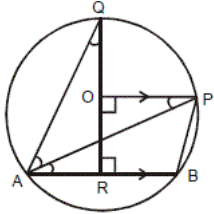
Q.70

AB is a chord of a circle with centre O. P and Q are points on the circumference of the circle such that $PO \parallel AB$ and QO, when extended, becomes perpendicular to AB at point R. If $AP > BP$, then what is the sum of $\angle APO$ and $\angle AQO$?

- 1 ☐ 30°
- 2 ☐ 40°
- 3 ☐ 45°
- 4 ☐ Cannot be determined

Solution:

Correct Answer : 3



$\angle QOP = 2\angle QAP$ (Angle subtended by an arc at the center is twice of that subtended by the same arc at the circumference)

$$\angle QOP = 90^\circ \Rightarrow \angle QAP = 45^\circ$$

$$\angle APO = \angle BAP \quad (\text{alternate interior angles})$$

$$\angle QAP = (180 - 90^\circ) - (\angle BAP + \angle AQO)$$

$$\Rightarrow \angle QAP = 90^\circ - (\angle APO + \angle AQO)$$

$$\Rightarrow \angle APO + \angle AQO = 90^\circ - \angle QAP = 45^\circ.$$

FeedBack

Bookmark

Answer key/Solution

Q.71

$x_1, x_2, x_3, \dots, x_n$ are the terms of a sequence such that $x_n - x_{n-1} + x_{n-2} = 0$ for $n > 2$. If the sum of the first 88 terms and the first 89 terms is 150 and 120 respectively, find the value of $\frac{(x_1 + x_2)}{2}$.

- 1 ☐ 124
- 2 ☐ - 124
- 3 ☐ - 30
- 4 ☐ 30

Solution:

Correct Answer : 3

By the problem,
 $x_n - x_{n-1} + x_{n-2} = 0$
 or $x_n = x_{n-1} - x_{n-2}$
 Now $x_1 = x_1$

$$x_2 = x_2$$

$$x_3 = x_2 - x_1$$

$$x_4 = x_3 - x_2 = x_2 - x_1 - x_2 = -x_1$$

$$x_5 = x_4 - x_3 = -x_1 - x_2 + x_1 = -x_2$$

$$x_6 = x_5 - x_4 = -x_2 + x_1$$

$$\text{Thus, } x_1 + x_2 + \dots + x_6 = 0.$$

\therefore The summation of every six consecutive terms starting from the first term is zero. The sum of first 88 terms of the sequence will be same as the sum of the first four terms of the sequence $= 2x_2 - x_1$, since $88 = 6k + 4$ and the sum of first 89 term of the sequence will be $x_2 - x_1$ since $89 = 6k + 5$ (where k is a natural number).

$$\therefore 2x_2 - x_1 = 150$$

$$x_2 - x_1 = 120$$

$$\Rightarrow \frac{1}{2}(x_1 + x_2) = -30.$$

FeedBack

Bookmark

Answer key/Solution

Q.72

If the system of equations $2x + 5y + 3z = 4$, $4x + 3y = -1$ and $2y + 5z = 19$, where x, y and z are real numbers, has a unique solution, then find the value of $(x$

$y + z$).



Solution:

Correct Answer : 4

Your Answer : 4

By the problem,

$$2x + 5y + 3z = 4 \quad \dots(i)$$

$$4x + 3y = -1 \quad \dots(ii)$$

$$2y + 5z = 19 \quad \dots(iii)$$

$$5(ii) - 3(i) : 14x - 9z = -17 \quad \dots(iv)$$

$$5(iii) - 2(i) : 19z - 4x = 87 \quad \dots(v)$$

Solving (iv) and (v), we get that $z = 5$ and $x = 2$

Putting the value of $x = 2$ in (ii), we get that $y = -3$

Therefore, $x + y + z = 2 - 3 + 5 = 4$.

FeedBack

Bookmark

Answer key/Solution

Q.73

Find the product of the first 12 terms of the sequence 3, 6, 12, 24,

1 ☐ $2^{66} \times 3^{12}$

2 ☐ $2^{78} \times 3^{12}$

3 ☐ $2^{55} \times 3^{12}$

4 ☐ $2^{66} \times 3^{11}$



Solution:

Correct Answer : 1

Your Answer : 1

The required product

$$= (2^0 \times 3) \times (2^1 \times 3) \times (2^2 \times 3) \times \dots \times (2^{11} \times 3)$$

$$= 3^{12} \times (2^{0+1+2+\dots+11}) = 3^{12} \times 2^{66}$$

FeedBack

Bookmark

Answer key/Solution

Q.74

$35x4y9z$, a seven-digit number, is completely divisible by 44. If 'x', 'y' and 'z' are single digit whole numbers, find the sum of all the distinct possible values ($y + z - x$).

1 ☐ 12

2 ☐ 60

3 ☐ 72

4 ☐ 66

Solution:

Correct Answer : 4

Bookmark

Answer key/Solution

Since $35x4y9z$ is divisible by 44, it must be divisible by 4 as well as 11.

According to the divisibility rule for 4 i.e. the number formed by the last two digits has to be divisible by 4, z must be either 2 or 6.

As the number is divisible by 11, $(3 + x + y + z) - (5 + 4 + 9)$ i.e. $(x + y + z - 15)$ must be of the form $11k$, where k is an integer.

Case I: When $z = 2$.

$$x + y + 2 - 15 = 11k$$

$$\Rightarrow x + y - 13 = 0 \text{ or } -11 \text{ (since } x + y \leq 18)$$

$$\Rightarrow x + y = 13 \text{ or } 2$$

The possible values of x , y and $(y + z - x)$ can be tabulated as:

x	y	$y + z - x$
9	4	-3
8	5	-1
7	6	1
6	7	3
5	8	5
4	9	7
0	2	4
1	1	2
2	0	0

Case II: When $z = 6$.

$$x + y + 6 - 15 = 11k$$

$$\Rightarrow x + y - 9 = 0 \text{ (since } x + y \leq 18)$$

$$\Rightarrow x + y = 9$$

The possible values of x , y and $(y + z - x)$ can be tabulated as:

x	y	$y + z - x$
9	0	-3
8	1	-1
7	2	1
6	3	3
5	4	5
4	5	7
3	6	9
2	7	11
1	8	13
0	9	15

Thus, the distinct possible values of $(y + z - x)$ are -3, -1, 0, 1, 2, 3, 4, 5, 7, 9, 11, 13 and 15.

Hence, the required sum is 66.

FeedBack

Q.75

What is the remainder when 13^{2013} is divided by 100?

Solution:

Correct Answer : 53

$$\text{Rem} \left[\frac{13^{2013}}{100} \right] = \text{Rem} \left[\frac{2197^{571}}{100} \right] = \text{Rem} \left[\frac{(-3)^{571}}{100} \right]$$

$$= \text{Rem} \left[\frac{-3(9)^{335}}{100} \right] = \text{Rem} \left[\frac{-3(10-1)^{335}}{100} \right]$$

$$= \text{Rem} \left[\frac{3(1-10)^{335}}{100} \right]$$

$$= \text{Rem} \left[\frac{3 \times \left({}^{335}C_0 \times 1^{335} \times 10^0 - {}^{335}C_1 \times 1^{334} \times 10 + {}^{335}C_2 \times 1^{333} \times 10^2 + \dots - {}^{335}C_{335} \times 1^0 \times 10^{335} \right)}{100} \right]$$

$$= \text{Rem} \left[\frac{-47}{100} \right] = 53.$$

FeedBack

Bookmark

Answer key/Solution

Q.76

If $150!$ is converted to base 7, how many consecutive zeros would be there at the end of it?

1 ☐ 242 ☐ 233 ☐ 374 ☐ 36**Solution:****Correct Answer : 1**

We have to find the highest power of 7 which divides 150! completely.

$$\text{The answer} = \left[\frac{150}{7} \right] + \left[\frac{150}{7^2} \right] = 24$$

Q.77

'D' is the absolute difference between a three-digit natural number and the sum of the digits of the number. If 'D' is a multiple of 12 and greater than 504, then how many values can 'D' assume?

Solution:**Correct Answer : 12**

Let the three-digit natural number be 'abc'.

$$\therefore D = 100a + 10b + c - (a + b + c) = 9(11a + b)$$

Since $D > 504 (= 9 \times 56)$ and it is also a multiple of 12, $(11a + b)$ has to be a multiple of 4 and greater than 56.

The possible values of a and b can be tabulated as:

a	b
5	5,9
6	2,6
7	3,7
8	0,4,8
9	1,5,9

Hence, D can assume 12 values.

Q.78

A shopkeeper offered two successive discounts of 30% and 20% on the purchase of a shirt to Raj and a one time discount of 50% on the purchase of the same shirt to Sahil. If the marked price of the shirt was Rs. 1500, then what was the absolute difference between the amounts paid by Raj and Sahil for purchasing the shirt?

1 ☐ Rs. 902 ☐ Rs.1103 ☐ Rs.504 ☐ None of these**Solution:****Correct Answer : 1****Your Answer : 1**

$$\begin{aligned} \text{The amount paid by Raj} &= (1500 \times (1 - 0.3) \times (1 - 0.2)) \\ &= \text{Rs. 840} \end{aligned}$$

$$\text{The amount paid by Sahil} = 1500 \times 0.5 = \text{Rs. 750}$$

Hence, the required difference = Rs. 90.

Q.79

Once upon a time, the king of a jungle planned a 2-kilometre race between a rabbit and a tortoise. Soon after the start of the race, the rabbit took a huge lead. On realizing that even after taking a nap of 't' min, he would beat the tortoise by 13 min, he stooped under a tree and went to sleep. Meanwhile the

tortoise kept walking. When the rabbit woke up, he realized that he had slept for $(14 + t)$ min, and immediately started running towards the target at a speed $\frac{3}{2}$ times his original speed. The race eventually ended in a dead heat. If the ratio of the original speed of the rabbit to that of the tortoise was $6 : 1$ and the rabbit overstretched his nap by $1\frac{1}{6}t$ min, then how long did the tortoise take to complete the race?

1 ☐ 24 min

2 ☐ 30 min

3 ☐ 28 min

4 ☐ 36 min

Solution:

Correct Answer : 2

The rabbit overstretched his sleeping time by $1\frac{1}{6}t$ min.

$$\therefore t + 1\frac{1}{6}t = 14 + t \Rightarrow t = 12$$

Let the speed (in km/min) of the rabbit and tortoise be '6x' and 'x' respectively.

Had the rabbit not overstretched his nap, he would have beaten the tortoise by 13 min.

$$\therefore \frac{2}{6x} + 12 + 13 = \frac{2}{x} \Rightarrow x = \frac{1}{15}$$

Hence, the time taken by the tortoise to complete the

$$\text{race} = \frac{2}{x} = \frac{2}{1/15} = 30 \text{ min.}$$

FeedBack

Bookmark

Answer key/Solution

Q.80

Twenty workers can complete a piece of work in 15 days. All of them started the work together, but on every alternate day, starting from the 2nd day, some workers did not turn up for the work. The number of workers who did not turn up for the work on the 2nd day was 2, on the 4th day was 4, on the 6th day was 6 and so on. In how many days was the work completed?

1 ☐ $20\frac{1}{3}$

2 ☐ $20\frac{1}{2}$

3 ☐ 20

4 ☐ 21

Solution:

Correct Answer : 2

Let each of the workers can do one unit of work in a day.

\therefore The total work = $(20 \times 15) = 300$ units.

According to the question, the number of workers who turned up for the work on the 1st day was 20, on the 2nd day was 18, on the 3rd day was 20, on the 4th day was 16 and so on.

Total work done in the first 20 days

$$= [(20 + 18) + (20 + 16) + \dots + (20 + 0)] = 290 \text{ units.}$$

On the 21st day, 20 workers would have turned up and completed the remaining 10 units of work in half a day.

Hence, the required number of days = $20\frac{1}{2}$ days.

FeedBack

Bookmark

Answer key/Solution

Q.81

Anushka and Anirudh working together can complete a piece of work in 20 days. They started the work together, but Anushka left after x days and Anirudh finished the remaining work in the next $\frac{x}{2}$ days. Had Anushka left after $\frac{3x}{4}$ days, Anirudh would have taken x days to finish the remaining work. Find the ratio of the efficiency of Anushka to that of Anirudh.

1 ☐ 2 : 3

2 ☐ 3 : 2

3 ☐ 2 : 14 ☐ 1 : 1**Solution:****Correct Answer : 4**

Let the efficiencies of Anirudh and Anushka be 'a' and 'b' units/day respectively.

$$\therefore (a+b)x + a \times \frac{x}{2} = (a+b) \frac{3x}{4} + a \times x \Rightarrow \frac{a}{b} = 1$$

Hence, the required ratio is 1 : 1.

Q.82

$\log_2 a \times \log_2 bc + \log_2 b \times \log_2 c = 9$, where 'a', 'b' and 'c' are positive real numbers. If $a \times b \times c = 4096$, then what is the value of $(\log_2 a)^2 + (\log_2 b)^2 + (\log_2 c)^2$?

**Solution:****Correct Answer : 126****Your Answer : 126**

$$\log_2 a \times (\log_2 bc) + \log_2 b \times \log_2 c = 9$$

$$\Rightarrow \log_2 a \times (\log_2 b + \log_2 c) + \log_2 b \times \log_2 c = 9$$

$$\Rightarrow \log_2 a \times \log_2 b + \log_2 a \times \log_2 c + \log_2 b \times \log_2 c = 9$$

Let $\log_2 a = x$, $\log_2 b = y$ and $\log_2 c = z$

$$xy + xz + yz = 9$$

We have,

$$a \times b \times c = 4096$$

$$\Rightarrow 2^{x+y+z} = 2^{12} \Rightarrow x + y + z = 12$$

We know that, $(x+y+z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$$\Rightarrow x^2 + y^2 + z^2 = (x+y+z)^2 - 2(xy + yz + zx)$$

$$= 12^2 - 2 \times 9 = 126.$$

Q.83

What is the number of common roots of the two equations given below?

$$x^3 - 3x^2 + 2x + 5 = 0$$

$$x^3 + x^2 + 7x + 6 = 0$$

1 ☐ 02 ☐ 13 ☐ 24 ☐ 3**Solution:****Correct Answer : 1****Your Answer : 1**

To find the common roots of the two equations, we have to equate them.

$$\therefore x^3 - 3x^2 + 2x + 5 = x^3 + x^2 + 7x + 6$$

$$\Rightarrow 4x^2 + 5x + 1 = 0$$

$$\Rightarrow x = -1 \text{ or } -\frac{1}{4}$$

But none of the two values satisfies the given equations. Hence, the two equations do not have common roots.

Q.84

Let $f(x) = [x]$, where $[x]$ denotes the greatest integer less than or equal to x . If 'a' and 'b' are two real numbers such that $f(3b - 2) = a - 2$ and $f(a + 2) = b + 6$, then find the sum of a and b.



Solution:

Correct Answer : 8

Your Answer : 8

Since $[x]$ denotes an integral value, we can say that $(a - 2)$ and $(b + 6)$ are integers, i.e. a and b are integers. Therefore, $(3b - 2)$ and $(a + 2)$ will also be integers.

The greatest integer of an integer is the integer itself.

$$f(3b - 2) = a - 2 \Rightarrow 3b - 2 = a - 2 \quad \dots (i)$$

$$f(a + 2) = b + 6 \Rightarrow a + 2 = b + 6 \quad \dots (ii)$$

Solving (i) and (ii), we get

$$a = 6 \text{ and } b = 2.$$

Hence, the sum of a and b = $6 + 2 = 8$.

Bookmark

Answer key/Solution

[FeedBack](#)

Q.85

Find the sum of an infinite number of terms of the series given below.

$$1 + 2 + \frac{11}{9} + \frac{16}{27} + \frac{21}{81} + \dots$$

1 ☐ 4.52 ☐ 5.253 ☐ 6.004 ☐ 4.66

Solution:

Correct Answer : 2

$$\text{Let } S = \frac{1}{3^0} + \frac{6}{3^1} + \frac{11}{3^2} + \frac{16}{3^3} + \frac{21}{3^4} + \dots \quad \dots (i)$$

$$3S = 3 + \frac{6}{3^0} + \frac{11}{3^1} + \frac{16}{3^2} + \frac{21}{3^3} + \dots \quad \dots (ii)$$

Subtracting (i) from (ii), we get

$$\Rightarrow 2S = 8 + \frac{5}{3^1} + \frac{5}{3^2} + \frac{5}{3^3} + \dots$$

$$\Rightarrow 2S = 8 + \frac{5}{3} \left(1 + \frac{1}{3} + \frac{1}{3^2} + \dots \right)$$

$$\Rightarrow 2S = 8 + \frac{5}{3} \left(\frac{1}{1 - \frac{1}{3}} \right) \Rightarrow S = \frac{21}{4} = 5.25.$$

[FeedBack](#)

Bookmark

Answer key/Solution

Q.86

Let $f(x) = x^9 - 17x^8 + 17x^7 - 17x^6 + \dots - 17x^2 + 17x$, where x is a real number. Find the value of $f(16)$.

1 ☐ 152 ☐ 163 ☐ 174 ☐ 18

Solution:

Correct Answer : 2

Bookmark

The given expression can be rewritten as:

$$\begin{aligned} f(x) &= x^8 + 17x - 17x^2 + 17x^3 - 17x^4 + 17x^5 - 17x^6 + 17x^7 - 17x^8 \\ &= x^8 + 17x \times (1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7) \\ &= x^8 + 17x \times \left[\frac{1(1-x^8)}{(1+x)} \right] \\ \therefore f(16) &= 16^8 + 17 \times 16 \left[\frac{1(1-16^8)}{(1+16)} \right] = 16. \end{aligned}$$

FeedBack

[Answer key/Solution](#)

Q.87

The concentration of milk in a 60L milk and water solution is 30%. If 6L of the solution is replaced by water and then 5L of the resulting solution is again replaced by water, then find the concentration of milk in the final solution.

1 ☐ 24.50%

2 ☐ 25.00%

3 ☐ 24.75%

4 ☐ 25.50%



Solution:

Correct Answer : 3

Your Answer : 3

The concentration of the milk in the final solution

$$= \frac{3}{10} \times \left(1 - \frac{6}{60}\right) \times \left(1 - \frac{5}{60}\right) \times 100 = 24.75\%.$$

FeedBack

[Bookmark](#)

[Answer key/Solution](#)

Q.88

The co-ordinates of vertices A, B and C of a parallelogram ABCD are (6, 1), (8, 2) and (9, 4) respectively. If E is a point on DC such that 2DE = 3EC, then what is the area (in sq. units) of triangle ADE?

1 ☐ 1.00

2 ☐ 0.90

3 ☐ 0.45

4 ☐ 0.50

Solution:

Correct Answer : 2

Since ABCD is a parallelogram, diagonal AC will divide it into two triangles of the equal area.

\therefore Area of $\triangle ADC$ = Area of $\triangle ABC$

$$\text{Also, } 2DE = 3EC \Rightarrow \frac{DE}{EC} = \frac{3}{2} \Rightarrow DE = \frac{3}{5} DC$$

$$\therefore \text{Area of } \triangle ADE = \frac{3}{5} \text{Area of } \triangle ADC = \frac{3}{5} \text{Area of } \triangle ABC$$

$$= \frac{3}{5} \times \frac{1}{2} \times |6 \times (2-4) + 8 \times (4-1) + 9 \times (1-2)|$$

$$= 0.9 \text{ sq. units.}$$

FeedBack

[Bookmark](#)

[Answer key/Solution](#)

Q.89

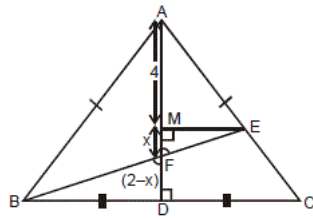
In an isosceles triangle ABC, AB = AC and AD is the perpendicular drawn from A to BC. E is a point on AC and BE cuts AD at F. EM is the perpendicular drawn from E to AD. If AD = 6 cm and AM = 4 cm, then find the length (in cm) of AF.

1 ☐ 4.6

2 ☐ 4.8

3 ☐ 5.24 ☐ Cannot be determined**Solution:****Correct Answer : 2**

$\triangle ABC$ is an isosceles triangle and AD is the \perp from A on BC . Therefore, D must be the midpoint of BC .
Let FM be x cm.
 $\therefore FD = (2-x)$ cm



In $\triangle FME$ and $\triangle FDB$,
 $\angle MFE = \angle DFB$ (vertically opposite angles)
 $\angle FME = \angle FDB = 90^\circ$
Therefore, $\triangle FME \sim \triangle FDB$ by AA similarity.

$$\therefore \frac{FM}{FD} = \frac{ME}{DB} \Rightarrow \frac{FM}{FD} = \frac{ME}{DC} \quad \dots(i)$$

In $\triangle AME$ and $\triangle ADC$,
 $\angle AME = \angle ADC = 90^\circ$
 $\angle AEM = \angle ACD$ ($\because ME \parallel DC$)
Therefore, $\triangle AME \sim \triangle ADC$ by AA similarity.

$$\therefore \frac{ME}{DC} = \frac{AM}{AD} = \frac{4}{6} = \frac{2}{3} \quad \dots(ii)$$

From (i) and (ii),

$$\frac{FM}{FD} = \frac{2}{3}$$

$$\text{Now, } \frac{x}{2-x} = \frac{2}{3} \Rightarrow x = 0.8$$

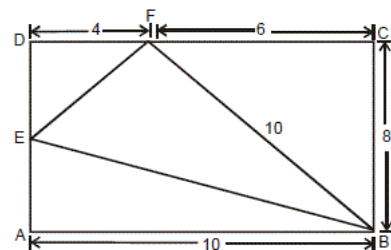
$$\therefore AF = AM + MF = 4 + 0.8 = 4.8 \text{ cm.}$$

Q.90

A rectangular sheet of paper $ABCD$ with $AB = 10$ cm and $BC = 8$ cm is folded along the line BE , where E is a point on AD . As a result, A coincides with F , a point on CD . Find the measure (in cm) of AE .

Solution:**Correct Answer : 5****Your Answer : 3**

The given information can be shown as given in the figure below.



Let AE be x .

$$\therefore DE = 8 - x$$

Since points E and F coincide, $\triangle AEB \cong \triangle FEB$.

$$\therefore EF = AE = x \text{ and } BF = AF = 10$$

$$\text{In } \triangle BCF, CF = \sqrt{10^2 - 8^2} = 6 \text{ cm}$$

$$\therefore DF = 10 - 6 = 4 \text{ cm}$$

In $\triangle EDF$,

$$EF^2 = DE^2 + DF^2$$

$$\Rightarrow x^2 = (8 - x)^2 + 4^2$$

$$\Rightarrow x = 5 \text{ cm.}$$

Q.91

There are two identical metal sheets, having same dimensions, of negligible thickness. One of them is given the shape of a hollow spherical ball and the other of a hemispherical bowl (such that there is no metal loss and the thickness remains the same as that of the sheets. Find the ratio of the capacity of the spherical ball to that of the hemispherical bowl.

1 ☐ 1: $\sqrt{2}$ 2 ☐ 1: 33 ☐ 1: $\sqrt{3}$ 4 ☐ 1: 8

Solution:

Correct Answer : 1

Let the radius of hollow spherical ball and that of the hemispherical bowl be 'r' and 'R' respectively.

$$\therefore 4\pi r^2 = 2\pi R^2$$

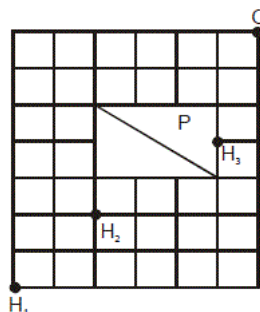
$$\Rightarrow R = r\sqrt{2}$$

$$\text{Hence, the required ratio} = \frac{4}{3}\pi r^3 : \frac{2}{3}\pi R^3 = 1 : \sqrt{2}.$$

[FeedBack](#)
[Bookmark](#)
[Answer key/Solution](#)

Q.92

The figure below shows the plan of a town, where all the streets are at right angles to one another. A rectangular park (P) is situated inside the town with a diagonal road running through it. Sudhansu's home and office are located at H_1 and O respectively. He has to start from his home, visit his girlfriend Trapti whose house is located at H_2 , and his friend Raman, whose house is located at H_3 , and then go to his office. If Sudhansu wants to take the shortest path, then in how many ways can he choose it?



Solution:

Correct Answer : 96

$$\text{The number of shortest paths from } H_1 \text{ to } H_2 = \frac{(2+2)!}{2!2!}$$

$$\text{The number of shortest paths from } H_2 \text{ to } H_3 = \frac{(1+3)!}{1!3!}$$

$$\text{The number of shortest paths from } H_3 \text{ to } O = \frac{(1+3)!}{1!3!}$$

Hence, the required number of shortest paths

$$= \frac{(2+2)!}{2!2!} \times \frac{(1+3)!}{1!3!} \times \frac{(1+3)!}{1!3!} = 96.$$

[FeedBack](#)
[Bookmark](#)
[Answer key/Solution](#)

Q.93

In how many ways can 18 identical candies be distributed among 8 children such that the number of candies received by each child is a prime number?

Solution:

Correct Answer : 28

Since the number of candies received by each child is a prime number, each child must get at least 2 candies. Once each child has received 2 candies, the remaining 2 candies should be distributed in such a manner that the number of candies with any child after the distribution remains a prime number.

The above condition can realise only if the remaining 2 candies are given to exactly two children in such a way that both the children receive one candy each. Hence, the number of ways of distribution = ${}^8C_2 = 28$.

[Bookmark](#)
[Answer key/Solution](#)

FeedBack

Q.94

A problem is given to two students – Novita and Sujuka. The probability that Novita can solve the problem correctly is 0.55 and that Sujuka can solve it correctly is 0.8. If the two of them try to solve the problem independently, then what is the probability that the problem would be solved correctly?

1 ☐ 0.25

2 ☐ 0.44

3 ☐ 0.86

4 ☐ 0.91

Solution:

Correct Answer : 4

The probability that Novita cannot solve the question correctly = $1 - 0.55 = 0.45$
 The probability that Sujuka cannot solve the question correctly = $1 - 0.8 = 0.2$
 The probability that none of the two can answer the question correctly = $0.45 \times 0.2 = 0.09$
 Hence, the probability that the problem would be solved correctly = $1 - 0.09 = 0.91$.

FeedBack

Bookmark

Answer key/Solution

Q.95

Seven years ago at the time of their marriage, the average age of a man and his wife was 28 years. At present, they have two children. Their daughter is 2 years older than their son. One year after the birth of the daughter, the average age of the man, wife and their daughter was 21 years, then the present age of the son is

1 ☐ 1 year

2 ☐ 2 years

3 ☐ 3 years

4 ☐ 4 years

Solution:

Correct Answer : 3

Let the daughter be born 'x' years after their marriage.
 Then,
 average age of the man, wife and their daughter one year after the birth of the daughter

$$= \frac{(28 + (x+1)) \times 2 + 1}{3} = \frac{59 + 2x}{3} = 21$$

$$\Rightarrow x = 2$$

\therefore Present age of the daughter = $7 - 2 = 5$ years

Hence, the present age of the son = $5 - 2 = 3$ years.

FeedBack

Bookmark

Answer key/Solution

Q.96

Salary of a person on 01-01-2001 is Rs. 6,400 per month with an increment Rs. 600 per month due on 01-09-2001, 01-09-2002, 01-09-2003, 01-09-2004 and 01-09-2005. If his monthly salary on 01-01-2006 increases by 40% of average monthly salary during last five years, what monthly salary did he draw in February 2006?

1 ☐ Rs. 8,400

2 ☐ Rs. 9,400

3 ☐ Rs. 11,150

4 ☐ Rs. 12,520

Solution:

Correct Answer : 4

His total salary in 2001 = $6400 \times 8 + (6400 + 600) \times 4$
= Rs. 79,200

His total salary in 2002 = $7000 \times 8 + (7000 + 600) \times 4$
= Rs. 86,400

His total salary in 2003 = $7600 \times 8 + (7600 + 600) \times 4$
= Rs. 93,600

His total salary in 2004 = $8200 \times 8 + (8200 + 600) \times 4$
= Rs. 1,00,800

His total salary in 2005 = $8800 \times 8 + (8800 + 600) \times 4$
= Rs. 1,08,000

His average monthly salary during last 5 years

$$= \frac{79200 + 86400 + 93600 + 100800 + 108000}{5 \times 12}$$

= Rs. 7,800

His monthly salary in December 2005 = $8800 + 600$

= Rs. 9,400

His monthly salary in February 2006

$$= 9400 + 7800 \times \frac{40}{100} = \text{Rs. } 12,520.$$

FeedBack

Bookmark

Answer key/Solution

Q.97

A retailer bought 96 cycles and sold 16 cycles at 10% profit, 25 cycles at 16% profit, 15 cycles at 18% profit and remaining 40 cycles at 22% profit. If the cost price of each cycle is Rs. 1,600, then his total profit is

1 ☐ Rs. 16,440

2 ☐ Rs. 18,720

3 ☐ Rs. 27,360

4 ☐ Rs. 30,860

Solution:

Correct Answer : 3

Profit on 16 cycles = $1600 \times 16 \times 0.1 = \text{Rs. } 2,560$

Profit on 25 cycles = $1600 \times 25 \times 0.16 = \text{Rs. } 6,400$

Profit on 15 cycles = $1600 \times 15 \times 0.18 = \text{Rs. } 4,320$

Profit on 40 cycles = $1600 \times 40 \times 0.22 = \text{Rs. } 14,080$

Total profit = $2560 + 6400 + 4320 + 14080 = \text{Rs. } 27,360.$

FeedBack

Bookmark

Answer key/Solution

Q.98

In a class, 40% students took Maths, 70% of the remaining took Biology and remaining 45 students took Commerce. The number of students in the class was



Solution:

Correct Answer : 250

Your Answer : 250

Let the total number of students in the class be x.

Then,

$$(x \times 0.6) \times 0.3 = 45$$

$$\Rightarrow x = 250.$$

FeedBack

Bookmark

Answer key/Solution

Q.99

A cylindrical well of height 20 meters and radius 7 meters is dug in a field 77 metres long and 42 metres wide. By how much will the level of the field rise if the earth taken out is spread evenly on the field?

1 ☐ 2 m

2 ☐ 3 m

3 ☐ 4 m4 ☐ 1 m**Solution:****Correct Answer : 4****Your Answer : 4**

The volume of the earth taken out
 $= \pi r^2 h$, where r is the radius and h is the height of the well

$$\text{Volume} = \frac{22}{7} \times 7 \times 7 \times 20 = 3080 \text{ m}^3$$

Now, the field area on which the earth is spread out
 $= 42 \times 77 - 154 = 3080 \text{ m}^2$

Let h be the height of the increase level.

Then, $3080 \times h = 3080$

$\Rightarrow h = 1 \text{ m.}$

[FeedBack](#)
[Bookmark](#)
[Answer key/Solution](#)
Q.100

A cask contains a mixture of two liquids P and Q in the ratio 7 : 5. When 6 L of this mixture is taken out from the cask and an equal volume is filled with Q, the ratio of P and Q becomes 21 : 19. Find the initial volume of the mixture in the cask.

1 ☐ 30L2 ☐ 45L3 ☐ 60L4 ☐ 42L**Solution:****Correct Answer : 3**

Let the quantity of P and Q in the initial mixture be $7x$ and $5x$ respectively.

According to the question we get,

$$\frac{7x - \frac{7}{12} \times 6}{5x - \frac{5}{12} \times 6 + 6} = \frac{21}{19}$$

On solving it we get $x = 5$.

Hence, required volume = $12x = 60 \text{ L.}$

[FeedBack](#)
[Bookmark](#)
[Answer key/Solution](#)