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VARC

LRDI

QA

Sec 1

Directions for questions (1 to 6): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

Why are kids so outrageously bad at gratitude? Between the ages of about four and twelve, children are near impossible to train to say thank you as though they mean it, when given a gift. When they get into their teens, their gratitude to their parents usually manifests as seething resentment, a desire to be socially disassociated from their parents, and a reminder to their parents that they never asked to be born.

In the early years, before a child can speak, he is totally dependent on adults to care for him. He demands food by crying, yelling and screaming, and he demands his every other need attended to by similar methods. The usual reward for attending to these needs is that the screaming stops. Gratitude at this age one would not expect to find. Later on, however, one might expect children to develop excellent skills at gratitude, for several reasons.

My explanation for the ingratitude of children is not a cheery one. I suspect that children benefit most consistently from a general policy of expecting gifts, demanding gifts, being self-centred, stubbornness, and threatening to throw tantrums, and that an instinct for gratitude would conflict with this. We know from our experience of life, that parents do continue to feed and clothe ungrateful children, and to love them and come to their aid even after the traumatic teenage years. The instincts of parents are strong enough to endure the bad behaviour of children, and therefore adults have to endure, because children have evolved to exploit this fact.

Had this been the whole truth, the world would have been populated by ungrateful children who grew into ungrateful adults. Fortunately for us, gratitude is something which is useful for an adult, and it is a skill which has to be learned. In adulthood, we cannot expect other people to help us out all the time. Eventually our parents die, and we must fend for ourselves, and strike deals with those around us. We have little respect for "spongers" – people who take from others all the time and give nothing. As adults, we cannot get pieces of cake by threatening to hold our breath until we pass out. We must learn some gratitude. If the adult is to be any good at this useful skill, it pays to get some practice in before it is needed all the time.

All people are not the same, and we would expect some people to start practising courtesy and gratitude earlier than others. The most efficient way to be is probably to have an ability to learn gratitude quickly, but to suppress the actual learning of gratitude until the moment when ingratitude stops being beneficial. We might expect socially talented but ungrateful teenagers to learn gratitude double-quick soon after they storm out of their parents' cosy semi-detached house, and get a room in a shared flat in a dodgy part of town. Interestingly enough, it seems that this is precisely what happens, but with one refinement: whereas these young adults become skilled at being grateful to most of the people they meet, they retain an ingratitude towards their parents. When dealing with someone who loves one unconditionally, it pays to exploit this and to remain demanding. Most co-operation, most love, is conditional upon reasonable behaviour in return.

Q.1

In the first paragraph, when the author gives examples of the ingratitude of children, he /she makes no mention of children below the age of four. Which of the following would best explain this fact?

1 ○ **At that age children are too dependent on their parents to understand what is gratitude / ingratitude.**

2 ○ **Most children at that age would not have learnt to speak.**

3 ○ **Children at that age are too young for gratitude to be expected of them.**

4 ○ **This is the stage at which parents tend to like their children the most.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3
Genre: Psychology / Sociology
Word Count: 551
This is an inference based question. To answer this, we need to take a look at the author's development of his argument in the second paragraph.
The author leaves out this age-group because gratitude or the lack of it would not be expected from them. He mentions this fact clearly in the second paragraph. This makes option 3 the correct answer.
Option 1 – It seems close but dependence on parents cannot play a role in understanding or expressing gratitude.
Option 2 - It is very probable that most children may not be able to speak at that young age, but speech is not necessary for the understanding and expression of gratitude.
Option 4 – It is irrelevant to the passage.

FeedBack

Directions for questions (1 to 6): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

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Q.2

Which of the following best explains the ungrateful behaviour of children?

1 ○ **They are born that way, and evolution seems to play its part by promoting ungrateful behaviour.**

2 ○ **Ungrateful behaviour in children does not come with any form of bad repercussions in this world.**

3 ○ **For children, being ungrateful has more benefits than being grateful.**

4 ○ **Ingratitude is useful for survival in a child's world.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3
Genre: Psychology / Sociology
Word Count: 551
This is an inferential question. However, it is from a specific part of the passage. So, it is a fact and inference based question. Pay close attention to the third paragraph as it is explained there.
Here the author explains how being ungrateful pays more than being grateful in a children's world. He also explains how parents indirectly continue to take care of the children despite their lack of gratitude. This makes option 3 the best answer. However, we need to eliminate the other options too.
Option 1 – It is partially correct. The author mentions evolution but not the way the question frames it. Secondly, 'children are born that way' is not factually supported by the passage.
Option 2 – It looks close but it is twisted. The author talks about lack of repercussions for children. It is not mentioned that adults or the world in general doesn't punish ingratitude. In fact, the author states the counter argument in the final paragraphs.
Option 4 – It is beyond the scope of the passage.

FeedBack

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Q.3

Why do young adults, who have learnt to be grateful to most people, still remain ungrateful to their parents?

1 **Because it benefits them if they remain ungrateful to unconditionally loving parents.**

2 **Because they still retain a degree of teenage angst.**

3 **Because their love for their parents is conditional while the parents' love is unconditional.**

4 **Because, with parents, they have the freedom to vent out their frustration.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 1
Genre: Psychology / Sociology
Word Count: 551
This is a fact based question. It is mildly tricky.
This behaviour of young adults is explained in these two sentences - ***"When dealing with someone who loves one unconditionally, it pays to exploit this and to remain demanding. Most co-operation, most love, is conditional upon reasonable behaviour in return."*** **So, option 1 is the best answer.**
Options 2, 3, and 4 – They are either irrelevant or partially correct.

FeedBack

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Q.4

Which of the following can be inferred from this line "...we cannot get pieces of cake by threatening to hold our breath until we pass out"?

1 ○ **The fact that ingratitude does not pay in the real world.**

2 ○ **Tactics that worked in childhood ceases to pay in adulthood.**

3 ○ **Children and adults display different behavioural traits.**

4 **The real world does not condone ingratitude.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Psychology / Sociology
Word Count: 551
This is a comparatively easy inferential question.
This is where the author humorously points out how a puerile tactic that might work for a child may not yield results for a grown-up. This makes option 2 the answer.
Options 1 and 4 – These are too serious to fit the bill. Moreover the word 'real' in both the options renders them factually inaccurate. The world that a child lives in is also real but there these tactics would clearly work.
Option 3 – This is totally out of scope.

FeedBack

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Q.5

Which of the following best describes the main idea of the passage?

1 **The author explains the causes of ingratitude in children.**

2 **The author tries to explain the concepts of gratitude in childhood and adulthood.**

3 **The author highlights gratitude as a trait that is both inherent and acquired.**

4 **The author explores how ingratitude is promoted in childhood.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Psychology / Sociology
Word Count: 551
It's a main idea question. It is very easy if we just eliminate options.
The passage describes ingratitude in children and the factors that promote it.
It also points out how this behaviour will have to change as the child grows up as situations change. This makes option 2 the answer.
Options 1 and 4 – They are partially correct. They do not cover the part of the passage that deals with the change takes place as the child enters adulthood.
Option 3 – It is inaccurate as gratitude may or may not be inherent though we are sure that it should be acquired.

FeedBack

Directions for questions (1 to 6): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

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Q.6

Which of the following situations would qualify as one that discourages ingratitude in adult life?

1 **A demagogue stays in power by playing with people's inherent weakness.**

2 **A cricket captain earns respect through his own skills.**

3 **A decisive leader naturally has more followers than a less decisive one.**

4 **A serial-defaulter in paying back loans finds it hard to get a loan.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 4
Genre: Psychology / Sociology
Word Count: 551
This is a further application question. Such questions are generally tough. However, with proper application of logic and with an approach to not over-think, one can answer this question.
Ingratitude is not beneficial in adult life as adults can no longer depend on others. Giving also emerges as an important aspect of one's behaviour in order to expect to receive from others. This is the logic the author explains in the last two paragraphs.Only option 4 reflects this aspect.
Option 1 – It doesn't cover the concept of gratitude or ingratitude. It talks about emotional manipulation of adults, not necessarily one's parents.
Options 2 and 3 – The concept of ingratitude is not mentioned anywhere.

FeedBack

Directions for questions (7 to12): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

At first sight, these mounds look like deposits of rubble. In fact, they are cairns, in memory of people who have led the shortest of lives. Young couples pace around them, not saying very much. Poked into the tops of the cairns, alongside statuettes of Jizō, protector of children and voyagers, are plastic toy windmills, in cheerful shades of pink, blue and yellow. Something for babies and children to play with, on the other side.

This is a place caught between the living and the dead: the summit of a volcanic mountain known as Osorezan (Mount Fear), situated at the northern tip of Japan's main island, and long regarded as an entrance to the underworld. Warm vapours waft from the rough, rocky terrain, through the fine-gravelled courtyard and cavernous wooden buildings of a Buddhist temple complex, Bodai-ji, run by the Sōtō Zen sect. Sulphur and incense mix in the air, while a trickle of hot, yellow-tinged water runs beneath a pathway into the temple, built upon wooden stilts.

The effect is one of human endeavour eking out a precarious compromise with something utterly alien and overpowering. Bodai-ji has been here, in one form or another, for most of the past 1,200 years. And yet it feels temporary, like it is just visiting.

This place has had a powerful effect on the temple's acting chief priest, Jikisai Minami. He had thought about death since he was young, wondering how such a thing could possibly exist in the world, and obsessed by the idea that though he hadn't 'started' himself, he nevertheless had to live with himself. He discovered the dead as what he calls 'a very real presence'. 'They really exist,' he tells me, as we speak inside one of the temple buildings. 'Just as powerfully as this table – sometimes even more so. It's completely different from them existing in memories.'

In the wake of March 2011, the dead played all sorts of roles in bringing comfort to the living. In some quarters, sightings of loved ones who had passed away were understood in terms of secular psychological theories of bereavement and grief. 'Post-bereavement hallucinations', as they are known, involve a person seeing, hearing or feeling the presence of someone who has passed away. It is considered a natural and often perfectly healthy means of psychological self-repair – for anyone, anywhere, but especially in such places as Tōhoku where an ageing population is often more at home with spirits than with psychologists or psychiatrists.

Elsewhere in Tōhoku, an indigenous female shamanic tradition well over 1,000 years old offered help of another kind. Whereas the festival of Obon is a celebration of business successfully concluded – the living and the dead doing right by one another, in a reasonably settled relationship – the 2011 tsunami created sudden ruptures that were very hard to heal. There had rarely been time for goodbyes. In these circumstances, a shaman was able to help supply that missing piece of a relationship by calling up the spirit of a client's relative and speaking with his or her voice: reassuring them that the deceased is contentedly at rest, and is watching over their families from the other world.

Q.7

What does the author imply by the line 'And yet it feels temporary, like it is just visiting'?

1 ○ **The deposits of rubble and the rocky terrain lend a transitory appeal to the place.**

2 ○ **Representing a compromise of the living with the dead lends a transient quality to the place.**

3 ○ **As the forms of the place have changed over time, the present rubble structure appears ephemeral.**

4 **As the place shelters death, it represents a compromise with the fleetingness of life.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: History / Cultural Studies
Word Count: 527
This is an inference based question. The answer comes from two lines- the first lines of the second and the third paragraph.
Options 1 and 3 - The physical features, are not the reasons for the place's temporary appearance.
The choice is between options 2 and 4. Option 2 is more comprehensive as it presents both the parties to the compromise- the living and the dead. Option 4 is distorted as the place doesn't shelter 'death', rather 'the dead'.

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Q.8

Why the sightings of the dead in the wake of March 2011 were considered natural 'especially' in Tohoku?

1 ○ **Tohoku is known for such sightings and for its shamanic tradition.**

2 ○ **Such post-bereavement hallucinations are a healthy means of psychological repair.**

3 ○ **Its ageing population is more comfortable with the idea of ghosts than that of psychiatrists.**

4 **Seeing and communicating with the deceased loved ones became common in the area after the 2011 Tsunami.**

Solution:
Correct Answer : 3
Genre: History / Cultural Studies
Word Count: 527
It is a mildly tricky fact based question. See the focus of the question on 'especially'. The answer comes directly from the last two lines of the second last paragraph. The clear answer is option 3.
Option 2 – It is a reason for such sightings being considered natural 'generally'.
Options 1 and 4 – These are factually incorrect.

FeedBack

Bookmark

Answer key/Solution

Directions for questions (7 to12): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

At first sight, these mounds look like deposits of rubble. In fact, they are cairns, in memory of people who have led the shortest of lives. Young couples pace around them, not saying very much. Poked into the tops of the cairns, alongside statuettes of Jizō, protector of children and voyagers, are plastic toy windmills, in cheerful shades of pink, blue and yellow. Something for babies and children to play with, on the other side.

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Q.9

Which of the following can be inferred about the Obon festival from the passage?

1 **Its celebration was negatively impacted by the 2011 Tsunami.**

2 **It is a celebration of successful consummation of business and relationships.**

3 **It is a celebration of the deaths that weren't expected.**

4 **Engaging Shamans for the deceased precludes the celebration of Obon for them.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3
Genre: History / Cultural Studies
Word Count: 527
This is a very easy inferential question. Focus on the last paragraph. From the last paragraph, it can be inferred that Obon is a festival to celebrate those deaths where the deceased got a chance to say goodbye and which weren't sudden like those in the Tsunami. This makes option 3 the correct choice.
Option 2 – It talks about business in the sense of commercial transactions, hence is incorrect.
Option 1 – It is beyond the scope of the passage.
Option 4 – It is also not indicated in the passage. Engaging Shamans for the deceased doesn't mean that the person can't celebrate Obon for them later.

FeedBack

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Q.10

Refer to the portion where the author talks about the help offered by the Shamanic tradition in the aftermath of the Tsunami. Which of the following is a logically similar situation?

1 ○ **A rescue team relaying reassuring messages of the well-being of some children, who are trapped in a cave, to their families**

2 ○ **An official relaying assuring messages of a secret agent on an unknown indefinite mission to his/her family**

3 **A family member mimicking the voice of the deceased and reading out his/her final will**

4 **A hypnotist inducing a temporary dream-like state in a wife so that she can communicate with her husband who is presumed dead**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 4
Genre: History / Cultural Studies
Word Count: 527
This is a further application question. The author mentions the Shamans as the ones who help people cope with the unexpectedness of the death of their loved ones.
Option 1 – It doesn't come near as the children are in the process of being rescued. There is hope of their coming back safely to the loved ones.
Option 3 – It doesn't come near because this family member isn't actually able to contact the deceased; he is mimicking the voice. It might or might not be to help the other family members.
Option 2 comes close. However, the officer is not dead. So, option 4 is a better choice as it talks about someone who is 'presumed dead'. The aim of the hypnotist is to help the wife cope with her situation.
So, option 4 is the correct answer.

FeedBack

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Q.11

What can be concluded from the fourth paragraph?

1 **Minami was obsessed with the idea that though he hadn't started the concept of death, he had to live with it.**

2 **Minami firmly believes in the dead existing outside memories.**

3 As a result of being amidst the dead, Minami suffers from hallucinations and calls the dead as concrete a presence as a table.

4 Minami finds the presence of spirits as very real and powerful.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: History / Cultural Studies
Word Count: 527
It is an inferential question. Just pay attention to the main idea of the author behind writing this paragraph.
Option 1 – It is incorrect because Minami was obsessed with the idea that though he hadn't brought forth his own existence, he had to live with himself.
Option 4 – It is incorrect as Miami doesn't talk about the dead as spirituality. 'Spirits' would have been more apt.
Option 3 – It is nowhere indicated and doesn't match the tone of the author.
Option 2 – It can be safely concluded from the last line of the paragraph.

FeedBack

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Q.12

Which of the following can be inferred from the passage?

1 **Tohoku is a superstitious place.**

2 **The living, at times, make efforts in the hope of comforting the dead.**

3 **A lot is still beyond the realms of human beings' knowledge.**

4 **Our mind heals us in strange ways.**

Solution:
Correct Answer : 2
Genre: History / Cultural Studies
Word Count: 527
It is an inferential question whose answer is linked to the main idea of the passage.
Option 1 - It is an extreme conclusion to make. The word 'superstitious' carries a negative connotation and the passage doesn't support it.
Option 2 – It is shown through the example of plastic toy windmills for deceased children in paragraph1. Hence it is the correct answer.
Option 3 – It is too broad.
Option 4 – It is incorrect as the post-bereavement hallucinations have been called natural in the passage. It is too broad as it covers the concept of 'mind' in general.

Directions for questions (13 to18): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

Stoke-On-Trent in northern England is home to the world's second-oldest professional football club, Stoke City FC. Founded in 1863, it enjoyed its heyday in the mid-1970s, when the club came close to winning the top division. The playing style was described by its manager, Tony Waddington, as "the working man's ballet". These days the flair is often provided by players from far afield. More than half the first-team squad comes from outside Britain, mostly from other parts of Europe. But that is about as far as Europhilia in Stoke goes.

In June's referendum on Britain's European Union membership, Stoke-on-Trent voted strongly for Brexit. A study by Italo Colantone and Piero Stanig of Bocconi University in Milan found that areas where jobs are vulnerable to competition from Chinese imports, mainly those in Britain's faded industrial north, tended to be in favour of leaving. Stoke City FC are known as the Potters in tribute to the city's once-great pottery industry. But Stoke also seemed predestined to be a Brexit supporter on another count. An analysis earlier this year found that in places such as Stoke, where the foreign-born population had increased by more than 200% between 2001 and 2014, a vote to leave was almost certain.

Immigration of low-skilled workers has become an increasingly contentious political issue in both America and Britain. Voters in host countries often see a sudden influx of people from places with lower wages, poorer working conditions, and a less generous welfare system as a threat to their livelihoods and living standards. In America the debate is about whether migrants hold down the wages of native workers. In Britain the main concern is that migrants put additional pressure on housing, public health services, schools, and transport systems.

Along with trade, migration is one of the two main sources of public anxiety about globalisation. For the host economy, the gains and drawbacks are similar to those from trade. Immigration enriches the workforce, allowing for a more finely graded specialisation that raises average productivity and living standards. Diverse workforces are likely to be more productive, especially in industries where success depends on specific knowledge, such as computing, health care, and finance. By easing labour bottlenecks, low-skilled migrants help to keep down prices of goods and services.

The drawback for native workers is competition for jobs and public services. In principle, an influx of low-skilled workers depresses wages for competing native workers, in the same theoretical way that opening up to trade with poor countries does. The balance of benefits and costs will depend on income: the rich are likely to do better out of the bargain. Economists dispute the extent of the overall gains and losses to hosts and labour-sending countries respectively.

Some benefits are uncontested. For immigrants from poorer countries moving to Stoke, or indeed to any part of Britain, there are clear gains. They can hope for a better job, a marked improvement in their quality of life and access to better public services such as health care. Economic migrants are by definition a mobile labour force. Migration helps to deal with labour shortages in low- or mid-skilled industries, such as mining or agriculture, and in remote places where it is difficult to attract native workers. Migrants are also often granted work visas on the strength of having scarce skills.

Many native workers see uncontrolled immigration as a break with an implicit contract: that the state will look after its own.

Q.13

Which of the following is implied by the author regarding support for Brexit in a city?

1 **The foreign-born population is less likely to support Brexit than native British population.**

2 **The increase in the non-British population is positively correlated with the likelihood of them voting in favour of Brexit.**

3 **More the immigration of high-skilled workers, more likely is the support for Brexit.**

4 **A city which supported Brexit is likely to have lesser GDP growth as compared to a city that did not support Brexit.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Politics / Economics
Word Count: 573
It is an inference based question. Refer to: ***"But Stoke also seemed predestined to be a Brexit supporter on another count. An analysis earlier this year found that in places such as Stoke, where the foreign-born population had increased by more than 200% between 2001 and 2014, a vote to leave was almost certain."*** **The passage mentions that the vote to leave EU was almost certain since there has been an increase in foreign born population in Kent. What the author, therefore, implies is a correlation between increase in foreign population and a vote to leave. This makes option 2 the correct answer.**
Option 1 – There is no mention of how the foreign-born population perceive Brexit. This option is out of the scope of what is being discussed in the passage. Hence it is incorrect.
Option 3 – The issue with this option is ***'high-skilled workers'****. The passage does not evaluate the impact of high-skilled workers. The issues raised in the passage is that of low-skilled immigrants. Hence it is incorrect.**
Option 4 – There is no discussion in the passage on the impact that GDP had on Brexit. Hence it is incorrect.

FeedBack

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Q.14

Each of the following is mentioned by the author as a benefit of immigration EXCEPT:

1 immigration augments the workforce.

2 a low-skilled workforce reduces labour bottlenecks.

3 a high-skilled workforce helps keep the prices of goods and services down.

4 immigration helps to mitigate labour shortages in certain sectors.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3
Genre: Politics / Economics
Word Count: 573
It is a fact based question. While discussing the benefit of immigration, the author states – *"By easing labour bottlenecks, low-skilled migrants help to keep down prices of goods and services."* It is clearly mentioned that *low-skilled* migrants help to keep down the prices and not *high-skilled* workers. The statement made in option 3 is not mentioned by the author. Hence it is the correct answer.
Option 1 – This is mentioned in the passage. Paragraph 4: *"Immigration enriches the workforce."*
Option 2 – This is mentioned in the passage. Paragraph 4: *"By easing labour bottlenecks, low-skilled migrants help to keep down prices of goods and services."*
Option 3 – This is mentioned in the passage. Paragraph 6: *"Migration helps to deal with labour shortages in low- or mid-skilled industries, such as mining or agriculture, and in remote places where it is difficult to attract native workers."*
The passage mentions that migration helps certain industries deal with labour shortages.

FeedBack

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Q.15

The passage suggests which of the following regarding the impact of migration of low-skilled workforce on the natives?

1 **The higher the income of the natives, the more likely are they to benefit from the migratory workforce.**

2 **There is likely to be a marked improvement on the lifestyles of the natives.**

3 **The competition for the private sector service jobs will increase if there is an increase in the migration of low-skilled workforce.**

4 **Balance of benefit and costs is in favour of the natives.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 1
Genre: Politics / Economics
Word Count: 573
Again, it's a fact based question. Refer to paragraph 5: *"The balance of benefits and costs will depend on income: the rich are likely to do better out of the bargain."* The passage mentions that the benefits depend on income. It goes on to say that the rich are likely to do better. So, it can be validly inferred that the higher the income, the more likely is the benefit from a migratory workforce. Hence, option 1 is correct.
Option 2 – This is incorrect. What the passage mentions is that *"For immigrants from poorer countries ….. They can hope for a better job, a marked improvement in their quality of life…"* (Paragraph 6). The said benefit is for the immigrant and not for the natives.
Option 3 – What the passage discusses is: *"The drawback for native workers is competition for jobs and public services."* (Paragraph 5). The passage does not suggest that the competition is for private sector service jobs. What the passage mentions is that the competition is for public services and not private sector services.
Option 4 – This is not true. The author remarks that the balance of benefit and costs will depend on the income. It cannot be inferred that the balance of benefit and costs is in favour of the natives in general.

FeedBack

Directions for questions (13 to18): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

Stoke-On-Trent in northern England is home to the world's second-oldest professional football club, Stoke City FC. Founded in 1863, it enjoyed its heyday in the mid-1970s, when the club came close to winning the top division. The playing style was described by its manager, Tony Waddington, as "the working man's ballet". These days the flair is often provided by players from far afield. More than half the first-team squad comes from outside Britain, mostly from other parts of Europe. But that is about as far as Europhilia in Stoke goes.

In June's referendum on Britain's European Union membership, Stoke-on-Trent voted strongly for Brexit. A study by Italo Colantone and Piero Stanig of Bocconi University in Milan found that areas where jobs are vulnerable to competition from Chinese imports, mainly those in Britain's faded industrial north, tended to be in favour of leaving. Stoke City FC are known as the Potters in tribute to the city's once-great pottery industry. But Stoke also seemed predestined to be a Brexit supporter on another count. An analysis earlier this year found that in places such as Stoke, where the foreign-born population had increased by more than 200% between 2001 and 2014, a vote to leave was almost certain.

Immigration of low-skilled workers has become an increasingly contentious political issue in both America and Britain. Voters in host countries often see a sudden influx of people from places with lower wages, poorer working conditions, and a less generous welfare system as a threat to their livelihoods and living standards. In America the debate is about whether migrants hold down the wages of native workers. In Britain the main concern is that migrants put additional pressure on housing, public health services, schools, and transport systems.

Along with trade, migration is one of the two main sources of public anxiety about globalisation. For the host economy, the gains and drawbacks are similar to those from trade. Immigration enriches the workforce, allowing for a more finely graded specialisation that raises average productivity and living standards. Diverse workforces are likely to be more productive, especially in industries where success depends on specific knowledge, such as computing, health care, and finance. By easing labour bottlenecks, low-skilled migrants help to keep down prices of goods and services.

The drawback for native workers is competition for jobs and public services. In principle, an influx of low-skilled workers depresses wages for competing native workers, in the same theoretical way that opening up to trade with poor countries does. The balance of benefits and costs will depend on income: the rich are likely to do better out of the bargain. Economists dispute the extent of the overall gains and losses to hosts and labour-sending countries respectively.

Some benefits are uncontested. For immigrants from poorer countries moving to Stoke, or indeed to any part of Britain, there are clear gains. They can hope for a better job, a marked improvement in their quality of life and access to better public services such as health care. Economic migrants are by definition a mobile labour force. Migration helps to deal with labour shortages in low- or mid-skilled industries, such as mining or agriculture, and in remote places where it is difficult to attract native workers. Migrants are also often granted work visas on the strength of having scarce skills.

Many native workers see uncontrolled immigration as a break with an implicit contract: that the state will look after its own.

Q.16

Which of the following encapsulates the main concern of immigration in America and in Britain respectively?

1 **Reduction in income, Increase in taxes**

2 **Increase in crime, Reduction in wages**

3 **Reduction in living standards, Threat to livelihood**

4 **Depression of wages, Pressure on certain resources**

Solution:
Correct Answer : 4
Genre: Politics / Economics
Word Count: 573

Bookmark

Answer key/Solution

It is a fact and inference based question. Paragraph 3: *"In America the debate is about whether migrants hold down the wages of native workers. In Britain the main concern is that migrants put additional pressure on housing, public health services, schools and transport systems."*
From the above, one can understand that the debate in America is whether migrants hold down wages. In Britain, it is about the additional pressure on certain resources.
Option 1 – Increase in taxes is not mentioned in the passage.
Option 2 – Increase in crimes is not mentioned in the passage.
Option 3 – The threat to livelihood is not the main debate in Britain.

FeedBack

Directions for questions (13 to18): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

Stoke-On-Trent in northern England is home to the world's second-oldest professional football club, Stoke City FC. Founded in 1863, it enjoyed its heyday in the mid-1970s, when the club came close to winning the top division. The playing style was described by its manager, Tony Waddington, as "the working man's ballet". These days the flair is often provided by players from far afield. More than half the first-team squad comes from outside Britain, mostly from other parts of Europe. But that is about as far as Europhilia in Stoke goes.

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The drawback for native workers is competition for jobs and public services. In principle, an influx of low-skilled workers depresses wages for competing native workers, in the same theoretical way that opening up to trade with poor countries does. The balance of benefits and costs will depend on income: the rich are likely to do better out of the bargain. Economists dispute the extent of the overall gains and losses to hosts and labour-sending countries respectively.

Some benefits are uncontested. For immigrants from poorer countries moving to Stoke, or indeed to any part of Britain, there are clear gains. They can hope for a better job, a marked improvement in their quality of life and access to better public services such as health care. Economic migrants are by definition a mobile labour force. Migration helps to deal with labour shortages in low- or mid-skilled industries, such as mining or agriculture, and in remote places where it is difficult to attract native workers. Migrants are also often granted work visas on the strength of having scarce skills.

Many native workers see uncontrolled immigration as a break with an implicit contract: that the state will look after its own.

Q.17

With which of the following is the author most likely to agree?

1 **It is the state's responsibility to look after its citizens.**

2 **The impact of immigration in some cases is analogous to that of trade.**

3 **Voting in favour of Brexit has been a mistake.**

4 **Those voting in favour of Brexit have not carefully analysed the positive impact of immigration.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Politics / Economics
Word Count: 573
It is an inferential question. Refer to paragraph 5: *"For the host economy, the gains and drawbacks are similar to those from trade."* Here, the author clearly mentions that the gains and drawbacks of immigration is similar to those from trade. So, the author would agree with the claim that the impact of immigration is analogous to that of trade in at least some cases.
Option 1 – Refer to the last sentence: *"Many native workers see uncontrolled immigration as a break with an implicit contract: that the state will look after its own."* The view that the state should take care of its citizens is one that is taken by many native workers. The author merely states their view and does not explicitly endorse that view.
Option 3 – The author's tone is neutral throughout the passage, S/he does not pass any judgement on whether Brexit is good or bad. Hence, option 3 is incorrect.
Option 4 – This has the same problem as option 3. The author does not criticize the views taken by those in favour of Brexit.

FeedBack

Directions for questions (13 to18): The passage below is accompanied by a set of six questions. Choose the best answer to each question.

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Q.18

The passage suggests that the likelihood of potential immigrant getting a visa is high in a sector where:

1 there is an excess of highly skilled workforce.

2 there is a huge growth potential.

3 there is a demand for mid-skilled workforce.

4 there is a shortage of qualified workforce with the right skills.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 4
Genre: Politics / Economics
Word Count: 573
It is a fact based question. Refer to paragraph 6: *"Migrants are also often granted work visas on the strength of having scarce skills."* From that statement it is implied that the chances of getting a visa is high if the person applying for visa has a scarce skill. Scarce skills are those wherein there is a shortage of qualified workforce with the right skills.
Option 1 – This is incorrect. If there is an excess of highly skilled workforce, then it would mean that there are no scarce skills. This statement contradicts the claim made by the author.
Option 2 – The growth potential is not mentioned by the author.
Option 3 – Scarce skills is not applicable to mid-skilled workforce. Hence this statement is incorrect.

FeedBack

Directions for questions (19 to21): The passage below is accompanied by a set of three questions. Choose the best answer to each question.

As algorithms have become increasingly advanced, they may start knowing us better than we know ourselves. At least, that's what one Target customer discovered when he angrily stormed into a store clutching a circular for maternity clothes that had been sent to his teenage daughter, only to later find out that the store had accurately predicted she was pregnant.

Such examples represent a cautionary tale for retailers. On one hand, they want to take advantage of moments like a first pregnancy when customers are liable to change their buying patterns. On the other, they need to weigh the invasiveness of such predictions with customers' need for privacy. "That's one example of where a company might receive blowback for an algorithm being too good," says Teodorescu.

Much of the earliest applications of machine learning (in the 1940s) concerned language. Since then, the field of textual analysis had burgeoned to the point where analysts can "fingerprint" particular authors by the probability of how they use connecting words like "the," "and," and "that."

More recently, machine learning has moved into the realm of detecting emotion by examining the probability of certain words appearing close to each other according to a person's mood. "The really hot topic in the field is sentiment analysis," says Teodorescu. In fact, it's become increasingly common for companies to monitor their brand image through what customers say about them online—looking for trends of positive or negative keywords.

You don't have to be, say, United Airlines to take advantage of these tools. Managers can now purchase off-the-shelf products that can mine Twitter or Yelp and develop a detailed analysis of how sentiment is changing in real time. "It has basically reduced the barrier between those who can afford to keep data programmers on staff and everyone else."

Q.19

Which of the following best describes the author's development of his point of view in the passage?

1 **The author starts with a cautionary tone and goes to explain the need to not panic about an impending doom.**

2 **The author explores the possible repercussions of a technology that is 'too accurate for its own benefit'.**

3 **The author discusses several measures one has to take in order to escape a possible technical catastrophe.**

4 **The author analyses the possible usage of a particular technical development with some examples.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 4
Genre: Marketing Technology
Word Count: 298
It's a logical structure question. The answer will be based on the tone of the author too. The process of elimination really helps in such questions.
Option 1 – There is no 'cautionary tone' in the beginning of the paragraph.
There is no mention of any 'impending doom'. It's an extreme option.
Option 2 – The focus of the author is not on any repercussions. So, this option is eliminated too.
Option 3 – 'Possible technical catastrophe' is factually not supported by the passage.
The author talks about the advancement of machine algorithms and how they might be used. The line 'too accurate for its own good' is mentioned in a sarcastic manner. It doesn't really impact the overall theme of the passage. So, option 4 is the correct answer.

FeedBack

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Q.20
According to the passage, how have companies been analysing sentiments?

1 **Generating trends for their products to reduce barriers with the competitors**

2 **Mining keywords used online for them to look for trends**

3 Looking for positive or negative trends for their products to reduce barriers with the competitors

4 By gauging the customer's mood to monitor the brand image

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Marketing Technology
Word Count: 298
This question is factual in nature. However, a close reading of the last two paragraphs is crucial.
Option 1 - The companies aren't "generating" trends, they are only extracting trends. Moreover the purpose of reducing barriers with competitors is not mentioned in this context. So, this option is incorrect.
Option 3 – For the same reason as above, it is eliminated too.
Option 4 – It is vague when it says 'gauging the customer's mood'. It doesn't detail the process of doing so.
Only 2 – It accurately captures the essence of the last two paragraphs. Pay special attention to the line: "In fact, it's become increasingly common for companies to monitor their brand image through what customers say about them online—looking for trends of positive or negative keywords." This makes option 2 the correct answer.

FeedBack

Directions for questions (19 to21): The passage below is accompanied by a set of three questions. Choose the best answer to each question.

As algorithms have become increasingly advanced, they may start knowing us better than we know ourselves. At least, that's what one Target customer discovered when he angrily stormed into a store clutching a circular for maternity clothes that had been sent to his teenage daughter, only to later find out that the store had accurately predicted she was pregnant.

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Q.21

What does the author imply by the example of 'fingerprinting by the analysts'?

1 **The power of textual analysis proved to be a boon for consumers.**

2 **Textual analysis could actually identify linguistic prints.**

3 **Since 1940s, textual analysis has been able to adapt to the demands of social media.**

4 **Textual analysis in the 1940s could compare different authors from their tones.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Marketing Technology
Word Count: 298
Though it is an inferential question, the options are easy to eliminate.
Option 1 – It's incorrect. Textual analysis proved beneficial for the companies, not the consumers.
Option 3 – 'Adapt to the demands of social media' is a distorted version of facts. The author talks about social media in a different context.
Option 4 – Tone is not mentioned anywhere in the passage. The example of fingerprinting talks about analysing texts.
Option 2 - Fingerprinting hasn't been used literally here. From analysis, the machines have been able to form a pattern of his writing style based on his use of connecting words. Only option 2 matches this. So, it is the correct answer.

FeedBack

Directions for questions (22 to24): The passage below is accompanied by a set of three questions. Choose the best answer to each question.

Long before Darwin set foot on the Beagle, Aristotle explained the natural world in terms of 'primary substances' – his name for individuals qua individuals, the most basic forms of existence. A single, specific acorn is a primary substance, from which you can then build more general categories such as acorns or seeds. Aristotle went on to analyse why something is the way it is in terms of four causes, with the final cause or telos (meaning 'end' in Ancient Greek) being the ultimate reason or purpose for its existence. A thing's telos is its essential nature. Acorns are meant to become oak trees, just as knives are meant to cut. The forces that animate the acorn lie within it, and work so as to achieve this ultimate goal. This teleology goes all the way down. Why does the acorn fall from the tree? Because, being made mostly of the elements of earth and water, it wants to find its natural place, which is as close to the centre of the Earth as possible.

For nearly two millennia, Aristotle's theory of final causes dominated how European scholars thought about the living world. But such notions were eventually displaced by the philosophies that emerged during the scientific revolution of the 16th and 17th centuries. Instead of the telos, science focused on the interaction of matter in motion in accordance with universal laws. On this view, organisms are not defined by some abstract, transcendent purpose; their distinct quality must come from what can be observed down here on Earth. Acorns become oak trees due to the unfolding interactions of their underlying matter. Tacking on something about the nature or purpose of an acorn adds nothing to this explanation.

Q.22

The dominant view of European scholars prior to the scientific revolution is that:

1 **the distinct quality of a living being is one that is observable.**

2 **a being has a final purpose for its existence.**

3 **the elements of earth and water were crucial for the natural evolution of living beings.**

4 **the *'what'* is more important than the *'why'*.**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
Genre: Science / Theory of evolution
Word Count: 285
It is an inferential question but it can be located in the second paragraph of the passage.
Prior to the scientific revolution, the dominant view was the Aristotelian theory of final causes (refer to the first sentence of paragraph 2). The final cause is explained in paragraph 1 *as the ultimate reason or purpose for its existence.* Therefore, the dominant view of European scholars during the period in question is that living world has an ultimate reason and purpose for existence. This makes option 2 the correct answer.
Option 1 – This is the view held by the 16th and 17th century scholars. Hence, it is incorrect.
Option 3 – This statement takes the last sentence mentioned in paragraph 1 out of context. *"Why does the acorn fall from the tree? Because, being made mostly of the elements of earth and water, it wants to find its natural place, which is as close to the centre of the Earth as possible."* The statement elucidates the purpose of acorns – to become an oak tree. This statement mentions natural evolution which is completely out of context.
Option 4 – The converse would be true. The final cause is about the purpose – "the why". So, those endorsing the view of Aristotle (like the scholars before scientific revolution), would consider "why" to be more important.

FeedBack

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Q.23

Which one of the following is an example of telos, as mentioned in the passage?

1 **A sailboat's purpose is sailing.**

2 **The basic ingredient of a book is paper.**

3 **The author of novel caused its existence.**

4 **A table does not collapse because it is designed with four legs of equal length.**

Solution:
Correct Answer : 1
Genre: Science / Theory of evolution
Word Count: 285
This is an extremely easy further application question.
Refer to paragraph 1: *"final cause or telos (meaning 'end' in Ancient Greek) being the ultimate reason or purpose for its existence."*
Telos is the ultimate reason as to why a thing exists. The ultimate reason for a sailboat to exist is to sail. Hence, option 1 is the correct answer.
Option 2 - This is an example of what a thing is made of. This is different from an ultimate purpose.
Option 3 – This is an example of how something coming into existence. It does not signify an ultimate purpose. The ultimate purpose of a novel would be to entertain or fascinate the readers.
Option 4 – This is an example of how something is designed. It does not signify an ultimate purpose. The ultimate purpose of a table would to be to hold things or provide a service to someone (like writing).

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Q.24

Which one of the following best captures the view held by modern scholars regarding acorns becoming oak trees?

1 **Arbitrary without any system**

2 **Deliberated by a superior motive**

3 **Natural selection**

4 **Gradual without any sense of a superior purpose**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 4
Genre: Science / Theory of evolution
Word Count: 285
Refer paragraph 2: *"On this view, organisms are not defined by some abstract, transcendent purpose; their distinct quality must come from what can be observed down here on Earth. Acorns become oak trees due to the unfolding interactions of their underlying matter. Tacking on something about the nature or purpose of an acorn adds nothing to this explanation."*
Two things can be validly inferred: 1 not defined by transcendent (or superior) purpose and 2 unfolding (or gradual) interactions. This makes option 4 the correct answer. It is gradual without a sense of a superior purpose.
Option 1- The view of the modern scholars is that purpose is not needed and what is important is that which is observable. That does not necessarily mean that there is no system or a process by which acorns become oak trees.
Option 2 - This is contradictory statement. The modern scholars hold the view that there is no superior motive.
Option 3 - Nothing about natural selection is mentioned in this passage.

FeedBack

Q.25
Directions for question 25: The passage given below is followed by four summaries. Choose the option that best captures the author's position.

One of the paradoxes of modern India is that, while there is on the surface tremendous interest in the country's ancient history, there is also the dwindling ability and appetite to engage with the past seriously. Mytho-nationalist claims about the achievements of ancient Indians rest on interpretations of historical texts, but most Indians, including those who seek to defend history from the crude uses of politicians, have never read these texts, nor are they even capable of reading them.

1. Modern India nationalists, in their quest to counter mytho-nationalist claims of politicians, are unable to read ancient texts; this hampers their ability to deal with their past.
2. The misreading or inability to read Vedas has rendered modern Indians incapable of truly appreciating their past.
3. Even well-meaning Indians, who want to keep history separate from politics, are unable to deal with India's past due to their inability to have a healthy appetite for historical texts.
4. Factors like the lack of ability to read old texts have rendered Modern India unable to truly engage with its past history.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 4
The paragraph has two main points:
a. Modern Indians want to engage with their history. However, they are not able to do it.
b. The factors responsible for this include the inability to read old texts.
Option 1 – Talks about modern Indian nationalists. This is misleading. Secondly, 'deal with their past' doesn't convey the meaning intended by the author.
Option 2 – 'Misreading' is factually incorrect. This option creates a cause and effect relationship which runs counter to the essence of the paragraph.
Option 3 – 'Lack of healthy appetite' is the distorted term. The author talks about it in a different spirit. Secondly, it is an incomplete option.
Option 4 – Correct captures both the main points. Hence, it is the correct answer.

FeedBack

Q.26

Directions for question 26: The passage given below is followed by four summaries. Choose the option that best captures the author's position.

Rationality has taken a hit in various domains of decision-making. Economics used to be thought of as a realm of pure rationality, something disproven, for starters, by the million-plus Pet Rocks sold around Christmas in 1975. Formal behavioural economics research comes to much the same conclusion more systematically. For example, people make radically different choices about an economic scenario depending on whether it is described in terms of risk or gain ("you have a 50% chance of losing X number of dollars," versus "you have a 50% chance of gaining X").

1. Formal behavioural economic research reinforces the belief that Economics is not really a realm of pure rationality and economic decisions can vary radically.
2. Rationality and decision-making don't go hand in hand as proven by the Pet Rocks and other such behavioural economic research projects.
3. Economics is no longer a realm of pure rationality and economic decision making now depends on the way questionnaires are framed.
4. People make economic decisions, not by analysing the issue rationally but by going with what sounds like a profitable venture.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 1
This is an easy to answer summary questions. The author has two main points:
a. Rationality, especially in the field of Economics, doesn't always govern decision making.
b. Example of Pet Rocks and the example of formal behavioural research reinforces the same conclusion.
Option 1 – It covers both the points. It is the most complete option.
Option 2 – It wrongly attributes 'Pet Rocks' as an economic research project. It is not mentioned in the paragraph. Hence, it is a distorted option.
Option 3 – This goes way beyond the scope of the paragraph. The author doesn't predict human behaviour.
Option 4 – 'Sounds like a profitable venture' is misleading and vague. This is not the main idea of the paragraph.

FeedBack

Q.27

Directions for question 27: The passage given below is followed by four summaries. Choose the option that best captures the author's position.

Unfortunately, many parents underrate the unique contribution that sport makes in the moulding process of their children and as a result they delay starting their children in such activities or skip it altogether. Children are then forced to learn the lessons associated with sport participation later on in life, as teenagers and in some cases as adults when the consequences weigh more heavily. While it is true that children can be exposed in other ways to develop various positive personality traits, sports competition further tests a person's true character by forcing the individual to exhibit exemplary behaviour in their actions, regardless of their emotions, such as congratulating your opponent immediately after facing defeat.

1. Though sports is by no means the sole method of developing positive personality traits, parents deliberately underrate its value and don't allow children to participate in sports until they are teenagers by which time the stakes are much higher.
2. Participating in sports benefits children by helping them develop some positive personality traits but parents, many times, underestimate the efficacy of sport which affects these kids.
3. Children learn many positive things from sports such as personality development and empathy; however, parents delay the participation of children in sports until the latter are teenagers and this proves to be counter-productive.
4. Sports competitions help children develop many positive personality traits in children such as exemplary behaviour and graciousness in defeat, a fact which is unfortunately ignored and underrated by parents.

Solution:
Correct Answer : 2
This is an easy summary question if one follows the method of elimination.
The paragraph has two main points:
a. Many parents, deliberately or otherwise, underrate the influence of sports participation due to which children can't learn some valuable lessons until much later.
b. Sports help children develop some positive traits.
Option 1 – It unnecessarily blames all parents for deliberately affecting the development of their children. The tone doesn't match that of the author.
Option 2 – It correctly summarises the paragraph keeping its main idea and essence intact. It covers both the points.
Option 3 – 'Empathy' is an alien term. '...which proves to be counter-productive' is factually incorrect. The option is distorted as it combines the two main points in an illogical manner.
Option 4 – Parents don't ignore the value of sports. They underrate sports participation. Secondly, this option doesn't cover the first point.

Bookmark

Answer key/Solution

FeedBack

Q.28
Directions for question 28: The five sentences (labelled 1, 2, 3, 4, 5) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

1. There are four such stabilities operating simultaneously at any given moment in every individual's life: sava-dharma (self-stability, the instinct of self-preservation, individuality); kula-dharma (family-stability); yuga-dharma (the spirit of the age); and sanatana-dharma (that which is unchanging, eternal, absolute).
2. Like all of us in the conflicts of life, Arjuna on the battlefield of Kurukshetra is caught simultaneously in these four dharmas and has to choose.
3. "Dharma" does not mean "religion" but "that which is stable," from the root dhri meaning earth.
4. Not choosing is not an option.
5. His choice will determine the quality of his character.

Solution:
Correct Answer : 31254
There are two strong mandatory pairs in this paragraph.
2 and 5 – Arjuna and 'his'.
3 and 1 – 'Such stabilities' in 1 refers to the concept of 'Dharma' as stability in 3.
Now the task is to find the opening sentence. 4 can't open as it talks about the choices mentioned in 5. So, 4 should come at the end.
So, 31254 becomes the right sequence.

Bookmark

Answer key/Solution

FeedBack

Q.29

Directions for question 29: The five sentences (labelled 1, 2, 3, 4, 5) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

1. The classical conception treats beauty as a matter of instantiating definite proportions or relations among parts, sometimes expressed in mathematical ratios, for example the 'golden section.'
2. The sculpture known as 'The Canon,' by Polykleitos, was held up as a model of harmonious proportion to be emulated by students and masters alike: beauty could be reliably achieved by reproducing its objective proportions.
3. Nevertheless, it is conventional in ancient treatments of the topic also to pay tribute to the pleasures of beauty, often described in quite ecstatic terms, as in Plotinus.
4. Though Plato and Aristotle disagree on what beauty is, they both regard it as objective in the sense that it is not localized in the response of the beholder.
5. This is the spirit that Beauty must ever induce: wonderment and a delicious trouble, longing and love and a trembling that is all delight.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 41235
The two strong mandatory pairs in the paragraph are:
1 and 2 – 'The sculpture' is an example of the 'golden section' mentioned in 1. It is an example of 'definition – example'.
2 and 3 – 'Nevertheless' in 3 contradicts, though mildly, the idea presented in 2.
Then we have a theme based pair. Plato and Aristotle are from the classical school of thought. So, 4 and 1 become the right order.
5 is a vague sentence. Upon a closer look, we can ascertain that 'this is the spirit' in 5 refers to the example given in 3. Refer to the phrase 'ecstatic terms' in 3.
So, 41235 is the correct sequence.

FeedBack

Q.30

Directions for question 30: The five sentences (labelled 1, 2, 3, 4, 5) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

1. Signs of whether it is working may come in a month; tests will confirm in three months.
2. Scientists have tried editing a gene inside the body for the first time, in a bold attempt to tackle an incurable a disease by permanently changing a patient's DNA.
3. Scientists have edited people's genes before, altering cells in the lab that are then returned to patients.
4. There also are gene therapies that do not involve editing DNA.
5. If successful, the new technique could give a major boost to the fledgling field of gene therapy.

Solution:
Correct Answer : 21534
3 and 4 is a strong mandatory pair. 'Also' in 4 adds new information to 3. Either 2 or 3 can open the paragraph. After, 3 and 4, 2 doesn't make any logical sense.
So, 2 is the opening sentence of the paragraph. It introduces the topic of a new kind of test. 3 talks about a previous scenario.
2 and 1 is a mandatory pair. 'It' in 1 refers to the test in 2. 5 comes next. 'The new technique' in 5 refers to 2 and 1.
So, the correct sequence is 21534.

Bookmark

Answer key/Solution

FeedBack

Q.31
Directions for question 31: The five sentences (labelled 1, 2, 3, 4, 5) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

1. Preliminary results from the probe reveal that Pluto has icy mountains and is geologically active, perhaps due to the decay of radioactive elements deep inside the planetary body.
2. Researchers were also surprised by the complex structure of Pluto's thin atmosphere, which contains multiple distinct layers of haze.
3. A study summarizing the major findings of the New Horizon mission's Pluto flyby raises questions about the dwarf planet's geology, atmosphere, and formation, as well as those of its moons.
4. The results change much of what was thought about the bodies in our solar system beyond Neptune.
5. This finding raises the possibility that other dwarf planets in the Kuiper Belt could also have surprising tectonic and volcanic features.

Solution:
Correct Answer : 31524
The strongest clue in the sentence is the closing sentence. 4 is a generic conclusion to the entire paragraph. The other sentences talk about Pluto and its atmosphere.
Now, we need to arrange 1, 2, 3, and 5.
3 opens the paragraph for two reasons: it talks about the mission which is the main idea of the paragraph, it also uses the indefinite article in 'a study'. This normally is a feature of a topic sentence.
3 and 1 make a mandatory pair – "The probe" in 1 refers to 3.
1 and 5 make a mandatory pair – "This finding" in 5 refers to both 3 and 1. So, it will come next.
2 has to come before 4. Refer to 'also' in 2.
So, the correct sequence is 31524.

Bookmark

Answer key/Solution

FeedBack

Q.32

Directions for question 32: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.

1. By signing up to social networking sites we also consciously agree to them using our personal data to some degree. But what of our children?
2. But is it safe, or even ethical to publish something about someone who can't give their consent?
3. Love it or loathe it, Facebook is a fact of modern life, and the arrival of smartphones has made the process of updating your status near-effortless.
4. Most people who have a relationship with a child will have posted, or thought about posting something about them on Facebook, Instagram or Twitter at some point.
5. Every time you post about your child on social media you are helping to create for them a data-rich, enduring and potentially problematic online profile.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 5
This is a tricky question. All the sentences surely belong to the same passage and topic. However, the tone or the theme of the sentence will help us identify the odd one out.
Let's find the pairs. In 3, the author introduces the concept of social media.
And in 1, s/he raises the issue of the safety of our children.
However, the author has not given any answer to the problem. The author is simply asking questions in 4 and 2.
5 is a very sure answer that social media is bad for our children. It's also very generic and broad. It can be a summary of the entire passage.
So, the correct sequence is 3142. 5 is the odd one out.

FeedBack

Q.33

Directions for question 33: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.

1. Patrick Guye and his colleagues were able to differentiate IPS cells into all three germ layers—endoderm, mesoderm, and ectoderm—that go on to form the cells of the body, such as blood vessels, muscle, and skin.
2. Testing drugs and their interactions, specifically on an individual patient's cells using an "organ-on-a-chip," looks extremely feasible.
3. Most studies of induced pluripotent stem (IPS) cells, which are mature cells that have been reprogrammed to act like undifferentiated embryonic stem cells, have focused on differentiating them into a single type of cell, even though most tissues and organs are made up of several types of cells.
4. Rather than immediately prompting the cells to develop into a particular tissue cell, the researchers waited to see what would happen next.
5. By genetically engineering the IPS cells to express a protein called GATA6, the cells developed into endoderm.

Solution:
Correct Answer : 2
The correct sequence is 3154. But we actually don't need to arrange the remaining sentences. All the other sentences talk about IPS cells and GATA6. 2 talks about a possible application of the technology. Thematically, it will come in the next paragraph.
So, 2 is the odd one out.

Bookmark

Answer key/Solution

FeedBack

Q.34
Directions for question 34: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.

1. Two people who attended the first series of events in May at Sydney University's MacLaurin Hall said the event included a "weird" and cringe-worthy performance while being served tiny share plates of "cheap" and "horrible" food.
2. Disappointed muggles say Sydney-based Immersive Events "tricked" them with its very own polyjuice potion, selling tickets using the Harry Potter name before it was revelio-d as a generic "Wizard's Brunch".
3. Worst of all, "there was no butter beer".
4. Like anything that achieves major cultural status, Harry Potter too has his share of haters.
5. Harry Potter fans who forked out up to $200 for a Hogwarts-style feast have said they were left wishing they could obliviate the "unpleasant, poorly organised" event from their memories.

Solution:
Correct Answer : 4
This is a very easy question. Sentences 1, 2, 3, and 5 talk about a Harry Potter themed event which some people found to be disappointing. Sentence 4 talks about negative criticism of 'Harry Potter', the book series. It doesn't fit the context. In fact, people who attended the event were Harry Potter fans whose expectations were not fulfilled by the event. So, 4 is the odd one out.

Bookmark

Answer key/Solution

FeedBack

Sec 2

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

Four patriotism based movies – Indian Soldier (IS), I-Indian (II), True Indian (TI), and Wake Up India (WUI) – were released on the occasion of 72nd Independence Day, on 15 August 2018. The total box office collection for the first 4 days of each of the 4 movies was Rs. 61 crores and the sum of the box office collection of the 4 movies for each of the first 4 days was also Rs. 61 crores. Further, it is known that the box office collection (in Rs. crores) on each of the 4 days for each of the 4 movies was a prime number, such that for any movie the box office collection of no two days was same and for any day, the box office collections of no two movies was same.

Q.35

If on the first day of the release, the box office collection of one of the movies was more than 300% of the combined box office collection of the other 3 movies on that day, then what was the box office collection (in Rs. crores) of that movie having the highest collection, on that day?

Solution:
Correct Answer : 47

Bookmark

Answer key/Solution

First, we need to find out in how many ways we can write 61 as a sum of 4 distinct prime numbers.
For this, first we write down all the prime numbers less than equal to 61,
i.e., 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59. Now, lets try to make all possible combinations of four numbers, out of these numbers, which adds up to 61.

61 = 47 + 7 + 5 + 2	...(1)
= 43 + 13 + 3 + 2	...(2)
= 43 + 11 + 5 + 2	...(3)
= 41 + 11 + 7 + 2	...(4)
= 41 + 13 + 5 + 2	...(5)
= 37 + 19 + 3 + 2	...(6)
= 37 + 17 + 5 + 2	...(7)
= 31 + 23 + 5 + 2	...(8)
= 31 + 17 + 11 + 2	...(9)
= 29 + 19 + 11 + 2	...(10)
= 29 + 17 + 13 + 2	...(11)
= 29 + 23 + 7 + 2	...(12)
= 23 + 19 + 17 + 2	...(13)

It is possible only in equation (1) i.e. 47 is more than 300% of the sum of other three i.e. 47 > 300% of (7 + 5 + 2).

FeedBack

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

Four patriotism based movies – Indian Soldier (IS), I-Indian (II), True Indian (TI), and Wake Up India (WUI) – were released on the occasion of 72nd Independence Day, on 15 August 2018. The total box office collection for the first 4 days of each of the 4 movies was Rs. 61 crores and the sum of the box office collection of the 4 movies for each of the first 4 days was also Rs. 61 crores. Further, it is known that the box office collection (in Rs. crores) on each of the 4 days for each of the 4 movies was a prime number, such that for any movie the box office collection of no two days was same and for any day, the box office collections of no two movies was same.

Q.36

If on the 2nd day of the release of the 4 movies, the movie 'True Indian' had the highest box office collection among the 4 movies, then the number of possible values of the box office collection of 'True Indian' on that day is

1 **13**

2 **10**

3 **7**

4 **5**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

First, we need to find out in how many ways we can write 61 as a sum of 4 distinct prime numbers.
For this, first we write down all the prime numbers less than equal to 61,
i.e., 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59. Now, lets try to make all possible combinations of four numbers, out of these numbers, which adds up to 61.

61 = 47 + 7 + 5 + 2	...(1)
= 43 + 13 + 3 + 2	...(2)
= 43 + 11 + 5 + 2	...(3)
= 41 + 11 + 7 + 2	...(4)
= 41 + 13 + 5 + 2	...(5)
= 37 + 19 + 3 + 2	...(6)
= 37 + 17 + 5 + 2	...(7)
= 31 + 23 + 5 + 2	...(8)
= 31 + 17 + 11 + 2	...(9)
= 29 + 19 + 11 + 2	...(10)
= 29 + 17 + 13 + 2	...(11)
= 29 + 23 + 7 + 2	...(12)
= 23 + 19 + 17 + 2	...(13)

Highest possible value can be – 47, 43, 41, 37, 31, 29 and 23 i.e. total 7 values.

FeedBack

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

Four patriotism based movies – Indian Soldier (IS), I-Indian (II), True Indian (TI), and Wake Up India (WUI) – were released on the occasion of 72nd Independence Day, on 15 August 2018. The total box office collection for the first 4 days of each of the 4 movies was Rs. 61 crores and the sum of the box office collection of the 4 movies for each of the first 4 days was also Rs. 61 crores. Further, it is known that the box office collection (in Rs. crores) on each of the 4 days for each of the 4 movies was a prime number, such that for any movie the box office collection of no two days was same and for any day, the box office collections of no two movies was same.

Q.37

If on the 3rd day of the release, the box office collection of one of the movies is more than the combined box office collection of the other 3 movies on that day but less than the twice of the combined box office collection of the other 3 movies on that day, then what can be the box office collection of the movie with the 2nd highest box office collection on that day?

1 **Rs. 17 crores**

2 **Rs. 19 crores**

3 **Rs. 23 crores**

4 **All of these**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

First, we need to find out in how many ways we can write 61 as a sum of 4 distinct prime numbers.
For this, first we write down all the prime numbers less than equal to 61,
i.e., 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59. Now, lets try to make all possible combinations of four numbers, out of these numbers, which adds up to 61.

61 = 47 + 7 + 5 + 2	...(1)
= 43 + 13 + 3 + 2	...(2)
= 43 + 11 + 5 + 2	...(3)
= 41 + 11 + 7 + 2	...(4)
= 41 + 13 + 5 + 2	...(5)
= 37 + 19 + 3 + 2	...(6)
= 37 + 17 + 5 + 2	...(7)
= 31 + 23 + 5 + 2	...(8)
= 31 + 17 + 11 + 2	...(9)
= 29 + 19 + 11 + 2	...(10)
= 29 + 17 + 13 + 2	...(11)
= 29 + 23 + 7 + 2	...(12)
= 23 + 19 + 17 + 2	...(13)

If we observe all the above equations, we can see that the given conditions are satisfied in equation (6), (7), (8) and (9). In all these 4 equations, 2nd highest box office collection of a movie is Rs. 17 crore, Rs. 19 crore and Rs. 23 crore. So, all 3 options are possible.

FeedBack

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

Four patriotism based movies – Indian Soldier (IS), I-Indian (II), True Indian (TI), and Wake Up India (WUI) – were released on the occasion of 72nd Independence Day, on 15 August 2018. The total box office collection for the first 4 days of each of the 4 movies was Rs. 61 crores and the sum of the box office collection of the 4 movies for each of the first 4 days was also Rs. 61 crores. Further, it is known that the box office collection (in Rs. crores) on each of the 4 days for each of the 4 movies was a prime number, such that for any movie the box office collection of no two days was same and for any day, the box office collections of no two movies was same.

Q.38

On the 4th day of the release of 4 movies, what can be the least possible value of the box office collection (in Rs. crores) of the movie, with the highest box office collection among the 4 movies, on that day?

Solution:
Correct Answer : 23

Bookmark

Answer key/Solution

First, we need to find out in how many ways we can write 61 as a sum of 4 distinct prime numbers.
For this, first we write down all the prime numbers less than equal to 61,
i.e., 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59. Now, lets try to make all possible combinations of four numbers, out of these numbers, which adds up to 61.

61 = 47 + 7 + 5 + 2 ...(1)
= 43 + 13 + 3 + 2 ...(2)
= 43 + 11 + 5 + 2 ...(3)
= 41 + 11 + 7 + 2 ...(4)
= 41 + 13 + 5 + 2 ...(5)
= 37 + 19 + 3 + 2 ...(6)
= 37 + 17 + 5 + 2 ...(7)
= 31 + 23 + 5 + 2 ...(8)
= 31 + 17 + 11 + 2 ...(9)
= 29 + 19 + 11 + 2 ...(10)
= 29 + 17 + 13 + 2 ...(11)
= 29 + 23 + 7 + 2 ...(12)
= 23 + 19 + 17 + 2 ...(13)

In equation 13, the highest value is the least among all the 13 equation.
∴ The required answer is 23.

FeedBack

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

A survey is conducted among the people of town 'X' to establish the data regarding their choices of two drinks - Tea and Coffee, and three games - Cricket, Football and Hockey. The results of the survey reveal that:
(i) All the people, who drink neither tea nor coffee, like to play both football and hockey.
(ii) All the people, who drink both tea and coffee, like to play cricket and exactly one more game out of football and hockey.
(iii) All the people, who drink any one (but not both) of the two drinks, like to play at most one of the three games.
(iv) The total population of town 'X' is 432, out of which, 120 people like to play cricket, 108 people like to play football, 144 people like to play hockey and 168 people do not like to play any of the three games.
(v) 24 people in town 'X' do not drink any of the two drinks whereas 288 people drink tea and 192 people drink coffee.
All the following questions are pertaining to the town X and based on the information given above.

Q.39
What percentage of the people who like to play Football don't drink any of the two drinks?

1 $16\frac{1}{6}\%$

2 $11\frac{1}{9}\%$

3 $22\frac{2}{9}\%$

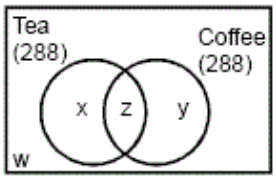
4 ○ **Cannot be determined**

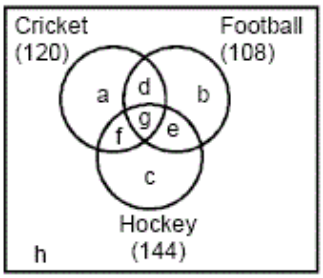
Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

Suppose 'w', 'x', 'y' and 'z' represent the number of persons who do not drink any of the two drinks, who drink only Tea, who drink only Coffee and who drink both the drinks. Then it is given that:
w = 24, (x + z) = 288, (y + z) = 192 and (w + x + y + z) = 432.
By solving all the equations above simultaneously, we get to know that: x = 216, y = 120 and z = 72.
Suppose 'a' persons like to play only Cricket, 'b' persons like to play only Football, 'c' persons like to play only Hockey, 'd' persons like to play both Cricket and Football but not Hockey, 'e' persons like to play both Football and Hockey but not Cricket, 'f' persons like to play both Cricket and Hockey but not Football, 'g' persons like to play all the three games and 'h' persons do not like to play any of the three games. Then it is given that:
(a + b + c) + (d + e + f) + g + h = 432,
a + (d + f) + g = 120,
b + (d + e) + g = 108,
c + (e + f) + g = 144 and
h = 168.
We also have the information to conclude that: (e + g) = w = 24, (f + d) = z = 72 and (a + b + c + h) = (x + y) = 336.
By solving all the equations above simultaneously, we get to know that: a = 36, e = 12, g = 12, (b + d) = 84, (d + f) = 72, (f + c) = 120 and (c + b) = 132.
Following diagrams will help further to understand all the calculations given above:





Conclusions:
(i) x = 216; y = 120; z = 72; w = 24
(ii) a = 36; e = 12; g = 12
(iii) e + g = w = 24; f + d = z = 72
(iv) a + b + c + h = x + y = 336
(v) b + d = 84; c + f = 120; b + c = 132

(e + g) as a percentage of 108 is $22\frac{2}{9}\%$.

FeedBack

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

A survey is conducted among the people of town 'X' to establish the data regarding their choices of two drinks - Tea and Coffee, and three games - Cricket, Football and Hockey. The results of the survey reveal that:
(i) All the people, who drink neither tea nor coffee, like to play both football and hockey.
(ii) All the people, who drink both tea and coffee, like to play cricket and exactly one more game out of football and hockey.
(iii) All the people, who drink any one (but not both) of the two drinks, like to play at most one of the three games.
(iv) The total population of town 'X' is 432, out of which, 120 people like to play cricket, 108 people like to play football, 144 people like to play hockey and 168 people do not like to play any of the three games.
(v) 24 people in town 'X' do not drink any of the two drinks whereas 288 people drink tea and 192 people drink coffee.
All the following questions are pertaining to the town X and based on the information given above.

Q.40
What percentage of the people who drink tea also like to play cricket?

1 $37\frac{1}{2}\%$

2 $41\frac{2}{3}\%$

3 $12\frac{1}{2}\%$

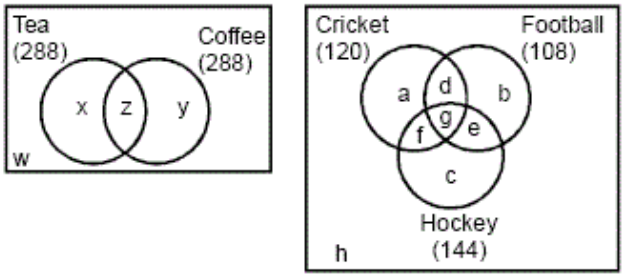
4 **Cannot be determined**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Suppose 'w', 'x', 'y' and 'z' represent the number of persons who do not drink any of the two drinks, who drink only Tea, who drink only Coffee and who drink both the drinks. Then it is given that:
w = 24, (x + z) = 288, (y + z) = 192 and (w + x + y + z) = 432.
By solving all the equations above simultaneously, we get to know that: x = 216, y = 120 and z = 72.
Suppose 'a' persons like to play only Cricket, 'b' persons like to play only Football, 'c' persons like to play only Hockey, 'd' persons like to play both Cricket and Football but not Hockey, 'e' persons like to play both Football and Hockey but not Cricket, 'f' persons like to play both Cricket and Hockey but not Football, 'g' persons like to play all the three games and 'h' persons do not like to play any of the three games. Then it is given that:
(a + b + c) + (d + e + f) + g + h = 432,
a + (d + f) + g = 120,
b + (d + e) + g = 108,
c + (e + f) + g = 144 and
h = 168.
We also have the information to conclude that: (e + g) = w = 24, (f + d) = z = 72 and (a + b + c + h) = (x + y) = 336.
By solving all the equations above simultaneously, we get to know that: a = 36, e = 12, g = 12, (b + d) = 84, (d + f) = 72, (f + c) = 120 and (c + b) = 132.
Following diagrams will help further to understand all the calculations given above:



Conclusions:
(i) x = 216; y = 120; z = 72; w = 24
(ii) a = 36; e = 12; g = 12
(iii) e + g = w = 24; f + d = z = 72
(iv) a + b + c + h = x + y = 336
(v) b + d = 84; c + f = 120; b + c = 132

We cannot say for sure about the choice of drink of 'a' persons.

FeedBack

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

A survey is conducted among the people of town 'X' to establish the data regarding their choices of two drinks - Tea and Coffee, and three games - Cricket, Football and Hockey. The results of the survey reveal that:
(i) All the people, who drink neither tea nor coffee, like to play both football and hockey.
(ii) All the people, who drink both tea and coffee, like to play cricket and exactly one more game out of football and hockey.
(iii) All the people, who drink any one (but not both) of the two drinks, like to play at most one of the three games.
(iv) The total population of town 'X' is 432, out of which, 120 people like to play cricket, 108 people like to play football, 144 people like to play hockey and 168 people do not like to play any of the three games.
(v) 24 people in town 'X' do not drink any of the two drinks whereas 288 people drink tea and 192 people drink coffee.
All the following questions are pertaining to the town X and based on the information given above.

Q.41

If the number of people who play only hockey is maximum possible, then what is the number of people who like to play Football and drink any one (but not both) of the two drinks?

1 **48**

2 **12**

3 **36**

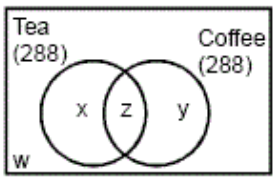
4 **Cannot be determined**

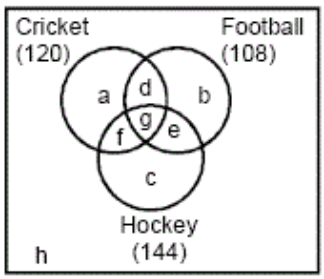
Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Suppose 'w', 'x', 'y' and 'z' represent the number of persons who do not drink any of the two drinks, who drink only Tea, who drink only Coffee and who drink both the drinks. Then it is given that:
w = 24, (x + z) = 288, (y + z) = 192 and (w + x + y + z) = 432.
By solving all the equations above simultaneously, we get to know that: x = 216, y = 120 and z = 72.
Suppose 'a' persons like to play only Cricket, 'b' persons like to play only Football, 'c' persons like to play only Hockey, 'd' persons like to play both Cricket and Football but not Hockey, 'e' persons like to play both Football and Hockey but not Cricket, 'f' persons like to play both Cricket and Hockey but not Football, 'g' persons like to play all the three games and 'h' persons do not like to play any of the three games. Then it is given that:
(a + b + c) + (d + e + f) + g + h = 432,
a + (d + f) + g = 120,
b + (d + e) + g = 108,
c + (e + f) + g = 144 and
h = 168.
We also have the information to conclude that: (e + g) = w = 24, (f + d) = z = 72 and (a + b + c + h) = (x + y) = 336.
By solving all the equations above simultaneously, we get to know that: a = 36, e = 12, g = 12, (b + d) = 84, (d + f) = 72, (f + c) = 120 and (c + b) = 132.
Following diagrams will help further to understand all the calculations given above:





Conclusions:
(i) x = 216; y = 120; z = 72; w = 24
(ii) a = 36; e = 12; g = 12
(iii) e + g = w = 24; f + d = z = 72
(iv) a + b + c + h = x + y = 336
(v) b + d = 84; c + f = 120; b + c = 132

Maximum value of 'c' is 120 and then taking f = 0, d = 72 and b = 12. Correct answer is 12.

FeedBack

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

A survey is conducted among the people of town 'X' to establish the data regarding their choices of two drinks - Tea and Coffee, and three games - Cricket, Football and Hockey. The results of the survey reveal that:
(i) All the people, who drink neither tea nor coffee, like to play both football and hockey.
(ii) All the people, who drink both tea and coffee, like to play cricket and exactly one more game out of football and hockey.
(iii) All the people, who drink any one (but not both) of the two drinks, like to play at most one of the three games.
(iv) The total population of town 'X' is 432, out of which, 120 people like to play cricket, 108 people like to play football, 144 people like to play hockey and 168 people do not like to play any of the three games.
(v) 24 people in town 'X' do not drink any of the two drinks whereas 288 people drink tea and 192 people drink coffee.
All the following questions are pertaining to the town X and based on the information given above.

Q.42
Which of the following is necessarily false?

1 **The number of people who play hockey and at least one more game, cannot be equal to 144.**

2 **The number of people who play football and at least one more game, cannot be equal to 108.**

3 **The number of people who play hockey, drink coffee and do not drink tea, cannot be equal to 120.**

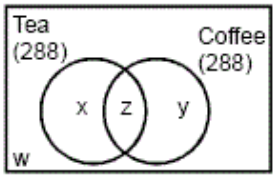
4 **None of the above.**

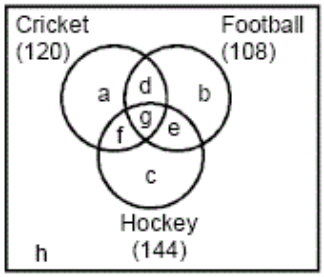
Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

Suppose 'w', 'x', 'y' and 'z' represent the number of persons who do not drink any of the two drinks, who drink only Tea, who drink only Coffee and who drink both the drinks. Then it is given that:
w = 24, (x + z) = 288, (y + z) = 192 and (w + x + y + z) = 432.
By solving all the equations above simultaneously, we get to know that: x = 216, y = 120 and z = 72.
Suppose 'a' persons like to play only Cricket, 'b' persons like to play only Football, 'c' persons like to play only Hockey, 'd' persons like to play both Cricket and Football but not Hockey, 'e' persons like to play both Football and Hockey but not Cricket, 'f' persons like to play both Cricket and Hockey but not Football, 'g' persons like to play all the three games and 'h' persons do not like to play any of the three games. Then it is given that:
(a + b + c) + (d + e + f) + g + h = 432,
a + (d + f) + g = 120,
b + (d + e) + g = 108,
c + (e + f) + g = 144 and
h = 168.
We also have the information to conclude that: (e + g) = w = 24, (f + d) = z = 72 and (a + b + c + h) = (x + y) = 336.
By solving all the equations above simultaneously, we get to know that: a = 36, e = 12, g = 12, (b + d) = 84, (d + f) = 72, (f + c) = 120 and (c + b) = 132.
Following diagrams will help further to understand all the calculations given above:





Conclusions:
(i) x = 216; y = 120; z = 72; w = 24
(ii) a = 36; e = 12; g = 12
(iii) e + g = w = 24; f + d = z = 72
(iv) a + b + c + h = x + y = 336
(v) b + d = 84; c + f = 120; b + c = 132

The number of people, who play hockey, drink coffee and do not drink tea CAN BE equal to 120.
So, statement (iii) is false.

FeedBack

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

Two friends - Amit and Sanjeev - were getting bored at home so decided to play some game. They collected 27 identical dice, where each face of dice had a distinct number written on it, out of 1, 2, 3, 4, 5, and 6. These numbers are written in such a way that the sum of numbers on every opposite faces is 7. They arranged these dice to form a large cube of size 3 x 3 x 3. The dice in the cube are arranged in such a way that the cube, so formed, has all the properties of these dice, i.e on each face of the cube only same digit of the dice are visible and the digit is distinct for all faces of the cube. Also, the sum of the digits visible on any two opposite faces of this cube is 7, e.g. the face on which all visible digits are 1 is opposite to the face on which all visible digits are 6.
The rules of this game will be as follows:
(I) Each of the two friends takes out a dice, one by one, from any visible face or edge or corner of the cube.
(II) When one takes out a dice, faces of its adjacent dice, which were earlier covered, will now become uncovered and number written on them will be visible.
(III) Now amount (in Rs.) equivalent to the sum of the numbers written on these recently uncovered faces will be paid by the other friend to the friend who has taken out the dice.
Example: **If Amit takes out a dice from the corner, faces of three of its adjacent dice now become uncovered. The sum of the numbers on these faces is the amount (in Rs.) paid by Sanjeev to Amit.**

Q.43

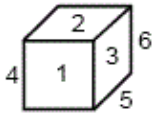
If Amit takes out a dice, then what is the largest possible amount (in Rs.) that Sanjeev has to pay to him?

Solution:

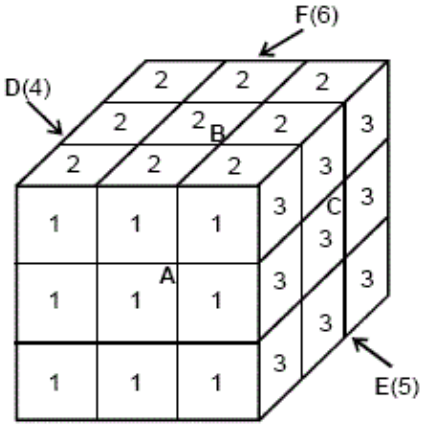
Correct Answer : 20

Bookmark

Answer key/Solution



Put all the dice one after other in the same orientation as shown in the picture above.



Let A, B, C, D, E and F are the faces with digits 1, 2, 3, 4, 5 and 6 respectively. When a dice is taken out from the centre of a face, 5 faces gets uncovered. But when a dice is taken out from the edge, 4 faces are uncovered whereas when a corner dice is taken out, 3 faces are uncovered.

The largest sum will be achieved when a cube from the centre of a face is taken out. Let a dice is taken out from the centre of A then the 5 faces uncovered are the numbers opposite to the number on face B, C, D and E and 1 face on the dice completely inside the cube. Hence the maximum possible sum is 2 + 3 + 4 + 5 + 6 i.e. 20.

FeedBack

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

Two friends - Amit and Sanjeev - were getting bored at home so decided to play some game. They collected 27 identical dice, where each face of dice had a distinct number written on it, out of 1, 2, 3, 4, 5, and 6. These numbers are written in such a way that the sum of numbers on every opposite faces is 7. They arranged these dice to form a large cube of size 3 x 3 x 3. The dice in the cube are arranged in such a way that the cube, so formed, has all the properties of these dice, i.e on each face of the cube only same digit of the dice are visible and the digit is distinct for all faces of the cube. Also, the sum of the digits visible on any two opposite faces of this cube is 7, e.g. the face on which all visible digits are 1 is opposite to the face on which all visible digits are 6.

The rules of this game will be as follows:

(I) Each of the two friends takes out a dice, one by one, from any visible face or edge or corner of the cube.

(II) When one takes out a dice, faces of its adjacent dice, which were earlier covered, will now become uncovered and number written on them will be visible.

(III) Now amount (in Rs.) equivalent to the sum of the numbers written on these recently uncovered faces will be paid by the other friend to the friend who has taken out the dice.

Example: **If Amit takes out a dice from the corner, faces of three of its adjacent dice now become uncovered. The sum of the numbers on these faces is the amount (in Rs.) paid by Sanjeev to Amit.**

Q.44

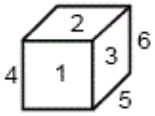
If Amit takes out a dice, then what is the smallest possible amount (in Rs.) that Sanjeev has to pay to him?

Solution:

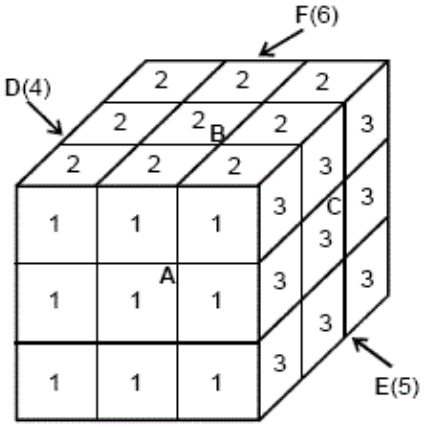
Correct Answer : 6

Bookmark

Answer key/Solution



Put all the dice one after other in the same orientation as shown in the picture above.



Let A, B, C, D, E and F are the faces with digits 1, 2, 3, 4, 5 and 6 respectively. When a dice is taken out from the centre of a face, 5 faces gets uncovered. But when a dice is taken out from the edge, 4 faces are uncovered whereas when a corner dice is taken out, 3 faces are uncovered.

The smallest sum will be achieved when the dice from the corner where face A, B, and C meet. The three faces uncovered are 1, 2 and 3 and hence the sum is 6.

FeedBack

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

Two friends - Amit and Sanjeev - were getting bored at home so decided to play some game. They collected 27 identical dice, where each face of dice had a distinct number written on it, out of 1, 2, 3, 4, 5, and 6. These numbers are written in such a way that the sum of numbers on every opposite faces is 7. They arranged these dice to form a large cube of size 3 x 3 x 3. The dice in the cube are arranged in such a way that the cube, so formed, has all the properties of these dice, i.e on each face of the cube only same digit of the dice are visible and the digit is distinct for all faces of the cube. Also, the sum of the digits visible on any two opposite faces of this cube is 7, e.g. the face on which all visible digits are 1 is opposite to the face on which all visible digits are 6.

The rules of this game will be as follows:

(I) Each of the two friends takes out a dice, one by one, from any visible face or edge or corner of the cube.

(II) When one takes out a dice, faces of its adjacent dice, which were earlier covered, will now become uncovered and number written on them will be visible.

(III) Now amount (in Rs.) equivalent to the sum of the numbers written on these recently uncovered faces will be paid by the other friend to the friend who has taken out the dice.

Example: **If Amit takes out a dice from the corner, faces of three of its adjacent dice now become uncovered. The sum of the numbers on these faces is the amount (in Rs.) paid by Sanjeev to Amit.**

Q.45

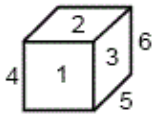
If Amit takes out a dice and then Sanjeev takes out a dice in such a way that the number of faces got uncovered is different for both of them, then what is the maximum possible difference between the amounts they need to pay each other? (Assume that both play intelligently and want to earn maximum possible amount from each other).

Solution:

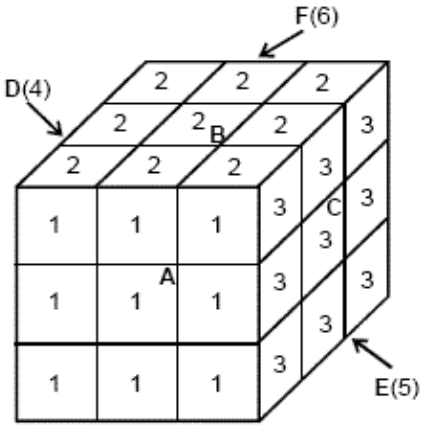
Correct Answer : 2

Bookmark

Answer key/Solution



Put all the dice one after other in the same orientation as shown in the picture above.



Let A, B, C, D, E and F are the faces with digits 1, 2, 3, 4, 5 and 6 respectively. When a dice is taken out from the centre of a face, 5 faces gets uncovered. But when a dice is taken out from the edge, 4 faces are uncovered whereas when a corner dice is taken out, 3 faces are uncovered.

Since both try to maximize the amount they earn from other person, one will take out a dice from centre and other from edge, we can say that the maximum possible difference is 20 – 18 (because 5 + 6 + 4 + 3) i.e. 2.

FeedBack

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

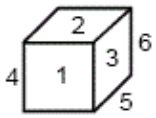
Two friends - Amit and Sanjeev - were getting bored at home so decided to play some game. They collected 27 identical dice, where each face of dice had a distinct number written on it, out of 1, 2, 3, 4, 5, and 6. These numbers are written in such a way that the sum of numbers on every opposite faces is 7. They arranged these dice to form a large cube of size 3 x 3 x 3. The dice in the cube are arranged in such a way that the cube, so formed, has all the properties of these dice, i.e on each face of the cube only same digit of the dice are visible and the digit is distinct for all faces of the cube. Also, the sum of the digits visible on any two opposite faces of this cube is 7, e.g. the face on which all visible digits are 1 is opposite to the face on which all visible digits are 6.
The rules of this game will be as follows:
(I) Each of the two friends takes out a dice, one by one, from any visible face or edge or corner of the cube.
(II) When one takes out a dice, faces of its adjacent dice, which were earlier covered, will now become uncovered and number written on them will be visible.
(III) Now amount (in Rs.) equivalent to the sum of the numbers written on these recently uncovered faces will be paid by the other friend to the friend who has taken out the dice.
Example: **If Amit takes out a dice from the corner, faces of three of its adjacent dice now become uncovered. The sum of the numbers on these faces is the amount (in Rs.) paid by Sanjeev to Amit.**

Q.46
If Amit takes out a dice from all eight corners, then what is the total amount (in Rs.) Sanjeev should pay to Amit?

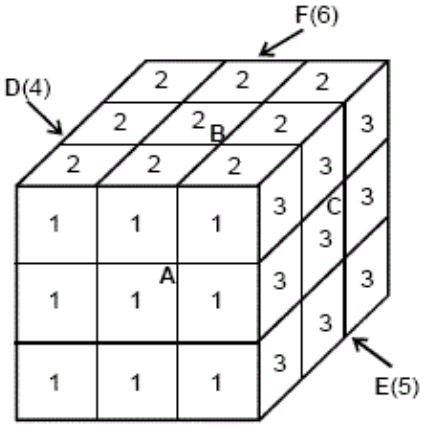
Solution:
Correct Answer : 84

Bookmark

Answer key/Solution



Put all the dice one after other in the same orientation as shown in the picture above.



Let A, B, C, D, E and F are the faces with digits 1, 2, 3, 4, 5 and 6 respectively. When a dice is taken out from the centre of a face, 5 faces gets uncovered. But when a dice is taken out from the edge, 4 faces are uncovered whereas when a corner dice is taken out, 3 faces are uncovered.

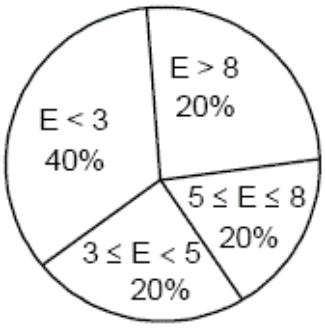
The eight corners are the corners where faces ABC, ABD, ACE, ADE, BCF, BDF, CEF and DEF meet. So, the three corners uncovered in these cases have the numbers on the faces of the remaining three faces i.e. (4,5,6), (3,5,6), (2,4,6), (2,3,6), (1,4,5), (1,3,5), (1,2,4) and (1,2,3) and hence the sum is 15 + 14 + 12 + 11 + 10 + 9 + 7 + 6 = 84.

FeedBack

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

In E-CL limited, there are a total of 2500 employees, each belonging to one of the 5 departments - Acads, Marketing, HR, Finance and Operations. Every employee belongs to one of the two designations i.e. Manager and Executive.
The table shown below gives the information about the number of employees belonging to the various departments at the two aforementioned designations and the following pie-chart shows the percentage-wise split up of the employees, according to their work experience.

Department	Number of employees	
	Managers	Executives
Acads	400	100
Marketing	300	350
Operations	300	450
Finance	150	200
HR	150	100



where E = Experience (in number of years)

Further, it is known that:
(i) No employee, belonging to Acads, has less than 3 years of experience.
(ii) 50% of the employees having experience of more than or equals to 3 years but less than 5 years, belong to Operations.
(iii) No Executive has an experience of more than or equal to 5 years.
(iv) No Manager has an experience of less than 3 years.

Q.47

What can be the maximum value of the number of employees, who are Managers in Marketing department with experience of more than or equal to 3 years but less than 5 years, as a percentage of the total number of employees belonging to Marketing?

1 **23.1%**

2 **46.2%**

3 **30.8%**

4 **41.4%**

Solution:
Correct Answer : 1

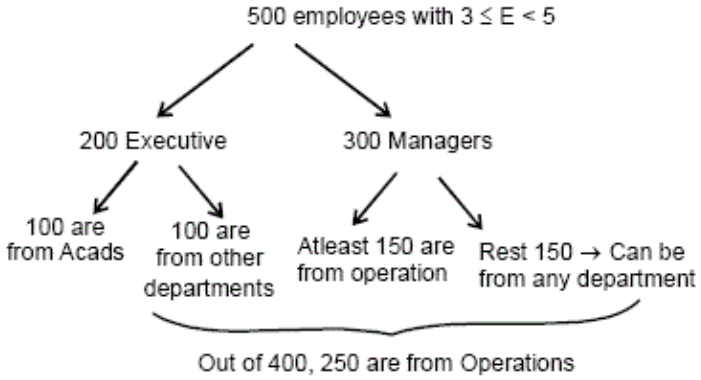
Bookmark

Answer key/Solution

Experience (E) (in number of years)	Number of Employees
$E < 3$	1000
$3 \leq E < 5$	500
$5 \leq E \leq 8$	500
$E > 8$	500

Out of the 500 employees with $(3 \leq E < 5)$,
(1) 100 are Executive, belonging to Acads. (Using (i) and (iii))
(2) 250 are from Operations. (Using (iii)), out of which, at least 150 are Mangers, belonging to Operations (Using (ii) and (iii)) and maximum 100 Executives, or maximum 250 can be Managers and 0 Executives.

i.e.,



Since out of 300 Managers at least 150 are from Operations, maximum number of Managers belonging to Marketing with $(3 \leq E < 5) = 150$

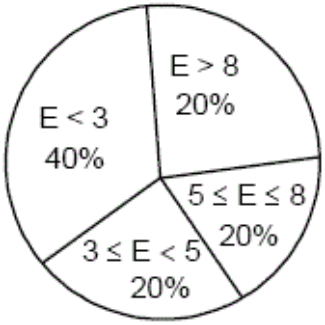
Percentage of total numbers of employees belonging to Marketing $= \frac{15\cancel{0}}{65\cancel{0}} \times 100 = 23.1\%$

FeedBack

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

In E-CL limited, there are a total of 2500 employees, each belonging to one of the 5 departments - Acads, Marketing, HR, Finance and Operations. Every employee belongs to one of the two designations i.e. Manager and Executive.
The table shown below gives the information about the number of employees belonging to the various departments at the two aforementioned designations and the following pie-chart shows the percentage-wise split up of the employees, according to their work experience.

Department	Number of employees	
	Managers	Executives
Acads	400	100
Marketing	300	350
Operations	300	450
Finance	150	200
HR	150	100



where E = Experience (in number of years)

Further, it is known that:
(i) No employee, belonging to Acads, has less than 3 years of experience.
(ii) 50% of the employees having experience of more than or equals to 3 years but less than 5 years, belong to Operations.
(iii) No Executive has an experience of more than or equal to 5 years.
(iv) No Manager has an experience of less than 3 years.

Q.48

If the number of employees belonging to Operations having experience of less than 3 years is minimum possible, then what can be the maximum number of employees belonging to Operations with experience of more than or equal to 5 years but less than or equals to 8 years?

Solution:
Correct Answer : 150

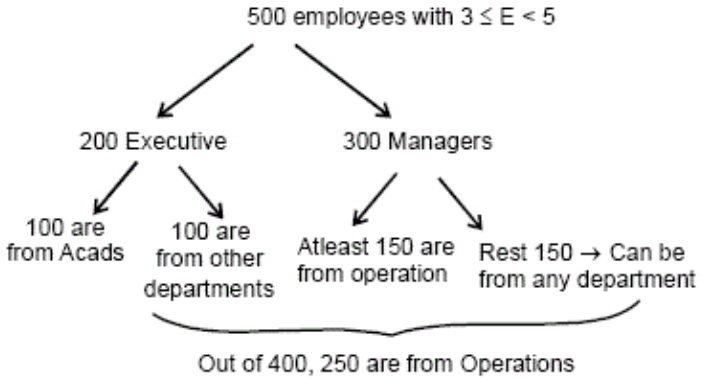
Bookmark

Answer key/Solution

Experience (E) (in number of years)	Number of Employees
$E < 3$	1000
$3 \leq E < 5$	500
$5 \leq E \leq 8$	500
$E > 8$	500

Out of the 500 employees with $(3 \leq E < 5)$,
(1) 100 are Executive, belonging to Acads. (Using (i) and (iii))
(2) 250 are from Operations. (Using (iii)), out of which, at least 150 are Mangers, belonging to Operations (Using (ii) and (iii)) and maximum 100 Executives, or maximum 250 can be Managers and 0 Executives.

i.e.,



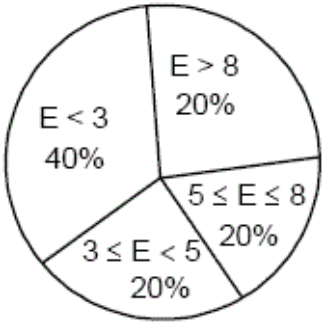
Since the number of employees with $(E < 3)$ is 1000 and all these 1000 employees are Executive, so at least 350 of these employees must be from Operations. This means out of 200 Executive with $(3 \leq E < 5)$, 100 are from Operations and the other 100 are from Acads. Now maximum 150 Managers, belonging to Operations can be with $(5 \leq E \leq 8)$.
(Since at least 150 Managers out of 300 Managers belonging to Operations must be with $(3 \leq E < 5)$).
$\therefore$ required number = 150.

FeedBack

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

In E-CL limited, there are a total of 2500 employees, each belonging to one of the 5 departments - Acads, Marketing, HR, Finance and Operations. Every employee belongs to one of the two designations i.e. Manager and Executive.
The table shown below gives the information about the number of employees belonging to the various departments at the two aforementioned designations and the following pie-chart shows the percentage-wise split up of the employees, according to their work experience.

Department	Number of employees	
	Managers	Executives
Acads	400	100
Marketing	300	350
Operations	300	450
Finance	150	200
HR	150	100



where E = Experience (in number of years)

Further, it is known that:
(i) No employee, belonging to Acads, has less than 3 years of experience.
(ii) 50% of the employees having experience of more than or equals to 3 years but less than 5 years, belong to Operations.
(iii) No Executive has an experience of more than or equal to 5 years.
(iv) No Manager has an experience of less than 3 years.

Q.49

If at least 50% of the employees in E-CL limited are women and there are no woman managers in Acads and at least 10% of the Managers in each of the remaining 4 departments are men, then what can be the maximum value of the number of men who are Executives in Marketing and Operations taken together?

1 **800**

2 **400**

3 **760**

4 **670**

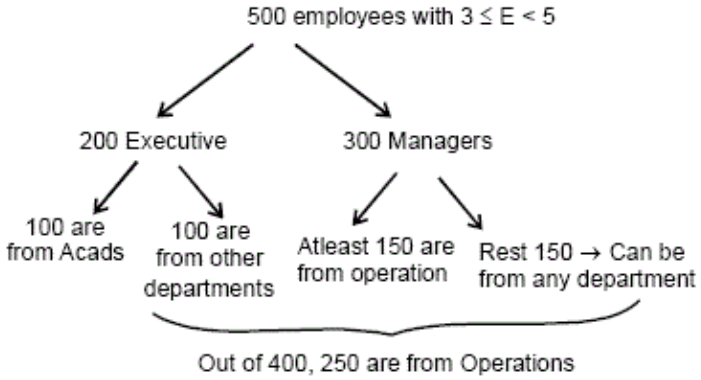
Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

Experience (E) (in number of years)	Number of Employees
$E < 3$	1000
$3 \leq E < 5$	500
$5 \leq E \leq 8$	500
$E > 8$	500

Out of the 500 employees with $(3 \leq E < 5)$,
(1) 100 are Executive, belonging to Acads. (Using (i) and (iii))
(2) 250 are from Operations. (Using (iii)), out of which, at least 150 are Mangers, belonging to Operations (Using (ii) and (iii)) and maximum 100 Executives, or maximum 250 can be Managers and 0 Executives.
i.e.,



Minimum number of women employees = 50% of 2500 = 1250
Considering no women Managers in Acads and at least 10% of Managers in each of the remaining department to be men, Maximum number of women Managers = 810
(i.e., 90% of total Managers excluding Acads)
So, remaining women employees i.e. (1250 – 810) = 440 are Executive. Since total number of Executives belonging to Acads, Finance and HR = 400, therefore at least 40 women Executives are there in Operations and Marketing put together.
Hence, maximum number of men Executives in Operation and Marketing put together = (350 + 450) – 40 = 760.

FeedBack

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

In E-CL limited, there are a total of 2500 employees, each belonging to one of the 5 departments - Acads, Marketing, HR, Finance and Operations. Every employee belongs to one of the two designations i.e. Manager and Executive.
The table shown below gives the information about the number of employees belonging to the various departments at the two aforementioned designations and the following pie-chart shows the percentage-wise split up of the employees, according to their work experience.

Department	Number of employees	
	Managers	Executives
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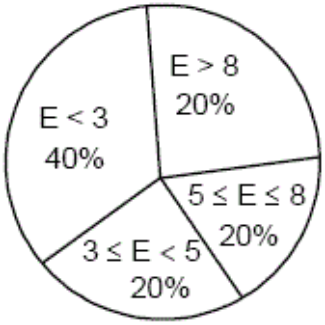
Marketing	300	350
Operations	300	450
Finance	150	200
HR	150	100



where E = Experience (in number of years)

Further, it is known that:
(i) No employee, belonging to Acads, has less than 3 years of experience.
(ii) 50% of the employees having experience of more than or equals to 3 years but less than 5 years, belong to Operations.
(iii) No Executive has an experience of more than or equal to 5 years.
(iv) No Manager has an experience of less than 3 years.

Q.50

If no Manager from Acads has experience of more than 5 years and no Manager from Operations has experience of more than 8 years, then what can be the maximum number of employees from Marketing are there having experience of more than or equal to 5 years and less than or equal to 8 years?

Solution:
Correct Answer : 100

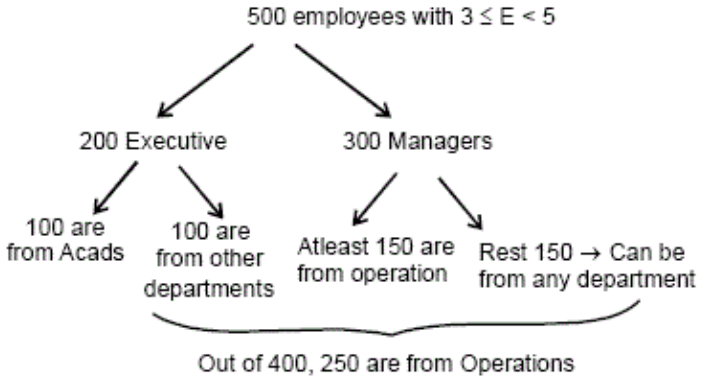
Bookmark

Answer key/Solution

Experience (E) (in number of years)	Number of Employees
$E < 3$	1000
$3 \leq E < 5$	500
$5 \leq E \leq 8$	500
$E > 8$	500

Out of the 500 employees with $(3 \leq E < 5)$,
(1) 100 are Executive, belonging to Acads. (Using (i) and (iii))
(2) 250 are from Operations. (Using (iii)), out of which, at least 150 are Mangers, belonging to Operations (Using (ii) and (iii)) and maximum 100 Executives, or maximum 250 can be Managers and 0 Executives.

i.e.,



There are 500 Employees with $(5 \leq E \leq 8)$ and 500 employees with $(3 \leq E < 5)$, out of which 200 are Executive, so this implies that the rest 800 are Managers, out of which 400 belongs to Acads and 300 belongs to Operations. Hence, at maximum only 100 can belong to Marketing.

FeedBack

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

Six sprinters - A, B, C, D, E and F - participated in a running race. There were four rounds in the race - Round 1, Round 2, Round 3 and Round 4. In each round, the sprinters were given a rank from 1 to 6, based on the time taken by them to finish the race i.e. who finished a round first was given rank 1, who finished second was given rank 2, and so on till who finished 6th was given rank 6. In each round, these sprinters based on their ranks from 1 to 6 were awarded 10, 8, 6, 4, 2 and 1 points respectively. The following table shows the partial information of the ranks attained by the top five persons, in terms of cumulative points scored in all the four rounds combined, out of these six sprinters. For each row, the last column gives the total number of points scored by the top five persons in all the rounds taken together.

	Ranks				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A		1			21
B			3		22
C				2	20
D	2				19
E			4		23

The following additional information is also known:

(i) Each sprinter finished within the first three positions in exactly two of these four rounds.

(ii) No two sprinters got the same rank in any round.

(iii) No sprinter finished two or more rounds at the same position.

Q.51

Who got the rank 1 in Round 1?

1 **A**

2 **B**

3 **E**

4 **Cannot be determined**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

According to the given information:
21 = (10 + 8 + 2 + 1) or (10 + 6 + 4 + 1).
22 = (10 + 6 + 4 + 2)
20 = (8 + 6 + 4 + 2)
19 = (10 + 6 + 2 + 1) or (8 + 6 + 4 + 1)
23 = (10 + 8 + 4 + 1)
As D got 4th rank in the round 1, the other rank can be 3rd , 4th and 6th. But as B and E got 3rd and 4th rank respectively in round 3, therefore, D got 6th rank in round 3. For A, he finished Round 1, Round 3 and Round 4 in the 2nd, 5th and 6th (or) 3rd, 4th and 6th rank. However, as in the Round 3, B, D and E got 3rd, 6th and 4th ranks respectively, the only possibility is 2nd, 5th and 6th rank. C cannot get 2nd or 6th rank in Round 3, therefore, C and A got 5th and 2nd rank respectively. Similarly, E got 2nd rank in Round 2 and, 1st and 6th rank in Round 1 and Round 4 in any order. With these results and the information given we get the following possibilities:

Possibility (a):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	6	1	2	5	21
B	4	5	3	1	22
C	3	4	5	2	20
D	2	3	6	4	19
E	1	2	4	6	23

Possibility (b):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	5	1	2	6	21
B	1	5	3	4	22
C	4	3	5	2	20
D	2	4	6	3	19
E	6	2	4	1	23

Either B or E won the race.

FeedBack

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

Six sprinters - A, B, C, D, E and F - participated in a running race. There were four rounds in the race - Round 1, Round 2, Round 3 and Round 4. In each round, the sprinters were given a rank from 1 to 6, based on the time taken by them to finish the race i.e. who finished a round first was given rank 1, who finished second was given rank 2, and so on till who finished 6th was given rank 6. In each round, these sprinters based on their ranks from 1 to 6 were awarded 10, 8, 6, 4, 2 and 1 points respectively. The following table shows the partial information of the ranks attained by the top five persons, in terms of cumulative points scored in all the four rounds combined, out of these six sprinters. For each row, the last column gives the total number of points scored by the top five persons in all the rounds taken together.

	Ranks				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A		1			21
B			3		22
C				2	20
D	2				19
E			4		23

The following additional information is also known:

(i) Each sprinter finished within the first three positions in exactly two of these four rounds.

(ii) No two sprinters got the same rank in any round.

(iii) No sprinter finished two or more rounds at the same position.

Q.52

Who was the last person to finish Round 2?

1 **F**

2 **C**

3 **E**

4 **Cannot be determined**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

According to the given information:
21 = (10 + 8 + 2 + 1) or (10 + 6 + 4 + 1).
22 = (10 + 6 + 4 + 2)
20 = (8 + 6 + 4 + 2)
19 = (10 + 6 + 2 + 1) or (8 + 6 + 4 + 1)
23 = (10 + 8 + 4 + 1)
As D got 4th rank in the round 1, the other rank can be 3rd , 4th and 6th. But as B and E got 3rd and 4th rank respectively in round 3, therefore, D got 6th rank in round 3. For A, he finished Round 1, Round 3 and Round 4 in the 2nd, 5th and 6th (or) 3rd, 4th and 6th rank. However, as in the Round 3, B, D and E got 3rd, 6th and 4th ranks respectively, the only possibility is 2nd, 5th and 6th rank. C cannot get 2nd or 6th rank in Round 3, therefore, C and A got 5th and 2nd rank respectively. Similarly, E got 2nd rank in Round 2 and, 1st and 6th rank in Round 1 and Round 4 in any order. With these results and the information given we get the following possibilities:

Possibility (a):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	6	1	2	5	21
B	4	5	3	1	22
C	3	4	5	2	20
D	2	3	6	4	19
E	1	2	4	6	23

Possibility (b):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	5	1	2	6	21
B	1	5	3	4	22
C	4	3	5	2	20
D	2	4	6	3	19
E	6	2	4	1	23

F finished last in Round 2.

FeedBack

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

Six sprinters - A, B, C, D, E and F - participated in a running race. There were four rounds in the race - Round 1, Round 2, Round 3 and Round 4. In each round, the sprinters were given a rank from 1 to 6, based on the time taken by them to finish the race i.e. who finished a round first was given rank 1, who finished second was given rank 2, and so on till who finished 6th was given rank 6. In each round, these sprinters based on their ranks from 1 to 6 were awarded 10, 8, 6, 4, 2 and 1 points respectively. The following table shows the partial information of the ranks attained by the top five persons, in terms of cumulative points scored in all the four rounds combined, out of these six sprinters. For each row, the last column gives the total number of points scored by the top five persons in all the rounds taken together.

	Ranks				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A		1			21
B			3		22
C				2	20
D	2				19
E			4		23

The following additional information is also known:

(i) Each sprinter finished within the first three positions in exactly two of these four rounds.

(ii) No two sprinters got the same rank in any round.

(iii) No sprinter finished two or more rounds at the same position.

Q.53

What is the sum of the ranks obtained by F in all the four rounds taken together?

1 **30**

2 **10**

3 **15**

4 **18**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

According to the given information:
21 = (10 + 8 + 2 + 1) or (10 + 6 + 4 + 1).
22 = (10 + 6 + 4 + 2)
20 = (8 + 6 + 4 + 2)
19 = (10 + 6 + 2 + 1) or (8 + 6 + 4 + 1)
23 = (10 + 8 + 4 + 1)
As D got 4th rank in the round 1, the other rank can be 3rd , 4th and 6th. But as B and E got 3rd and 4th rank respectively in round 3, therefore, D got 6th rank in round 3. For A, he finished Round 1, Round 3 and Round 4 in the 2nd, 5th and 6th (or) 3rd, 4th and 6th rank. However, as in the Round 3, B, D and E got 3rd, 6th and 4th ranks respectively, the only possibility is 2nd, 5th and 6th rank. C cannot get 2nd or 6th rank in Round 3, therefore, C and A got 5th and 2nd rank respectively. Similarly, E got 2nd rank in Round 2 and, 1st and 6th rank in Round 1 and Round 4 in any order. With these results and the information given we get the following possibilities:

Possibility (a):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	6	1	2	5	21
B	4	5	3	1	22
C	3	4	5	2	20
D	2	3	6	4	19
E	1	2	4	6	23

Possibility (b):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	5	1	2	6	21
B	1	5	3	4	22
C	4	3	5	2	20
D	2	4	6	3	19
E	6	2	4	1	23

Total of ranks obtained by F = 3 + 6 + 1 + 5 = 15.

FeedBack

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

Six sprinters - A, B, C, D, E and F - participated in a running race. There were four rounds in the race - Round 1, Round 2, Round 3 and Round 4. In each round, the sprinters were given a rank from 1 to 6, based on the time taken by them to finish the race i.e. who finished a round first was given rank 1, who finished second was given rank 2, and so on till who finished 6th was given rank 6. In each round, these sprinters based on their ranks from 1 to 6 were awarded 10, 8, 6, 4, 2 and 1 points respectively. The following table shows the partial information of the ranks attained by the top five persons, in terms of cumulative points scored in all the four rounds combined, out of these six sprinters. For each row, the last column gives the total number of points scored by the top five persons in all the rounds taken together.

	Ranks				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A		1			21
B			3		22
C				2	20
D	2				19
E			4		23

The following additional information is also known:

(i) Each sprinter finished within the first three positions in exactly two of these four rounds.

(ii) No two sprinters got the same rank in any round.

(iii) No sprinter finished two or more rounds at the same position.

Q.54

In how many rounds did B finish earlier than D finish?

1 **None**

2 **One**

3 **Two**

4 **Three**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

According to the given information:
21 = (10 + 8 + 2 + 1) or (10 + 6 + 4 + 1).
22 = (10 + 6 + 4 + 2)
20 = (8 + 6 + 4 + 2)
19 = (10 + 6 + 2 + 1) or (8 + 6 + 4 + 1)
23 = (10 + 8 + 4 + 1)
As D got 4th rank in the round 1, the other rank can be 3rd , 4th and 6th. But as B and E got 3rd and 4th rank respectively in round 3, therefore, D got 6th rank in round 3. For A, he finished Round 1, Round 3 and Round 4 in the 2nd, 5th and 6th (or) 3rd, 4th and 6th rank. However, as in the Round 3, B, D and E got 3rd, 6th and 4th ranks respectively, the only possibility is 2nd, 5th and 6th rank. C cannot get 2nd or 6th rank in Round 3, therefore, C and A got 5th and 2nd rank respectively. Similarly, E got 2nd rank in Round 2 and, 1st and 6th rank in Round 1 and Round 4 in any order. With these results and the information given we get the following possibilities:

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	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
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B	4	5	3	1	22
C	3	4	5	2	20
D	2	3	6	4	19
E	1	2	4	6	23

Possibility (b):

	Rank				
Persons	Round 1	Round 2	Round 3	Round 4	Total Points
A	5	1	2	6	21
B	1	5	3	4	22
C	4	3	5	2	20
D	2	4	6	3	19
E	6	2	4	1	23

In two rounds, B finished better than D.

FeedBack

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

A company 'ABC' is in the manufacturing business of gears for motor bikes. These gears after being manufactured were packed in a packet such that each packet has 100 pieces of gears. Total number of packets need not be an integer value, as the last packet may contain less than 100 pieces in it depending on the number of manufactured pieces,e.g, if company manufactures 340 pieces then number of packets will become 3.40. The cost (in '00 Rs.) and sales revenue (in '00 Rs.) of the company are given by two quadratic functions, as written below, where x represents the number of packets and 0 < x < 7. Assume that all manufactured pieces are sold. The number of pieces manufactured by the company is an integer value always.

Profit earned by the company = Total sales – Total cost.
Cost function: $x^2 - 8x + 18$
Sales revenue function: $6x - x^2 + 8$

Q.55
For how many values of x the company makes a profit?

1 **540**

2 **541**

3 **539**

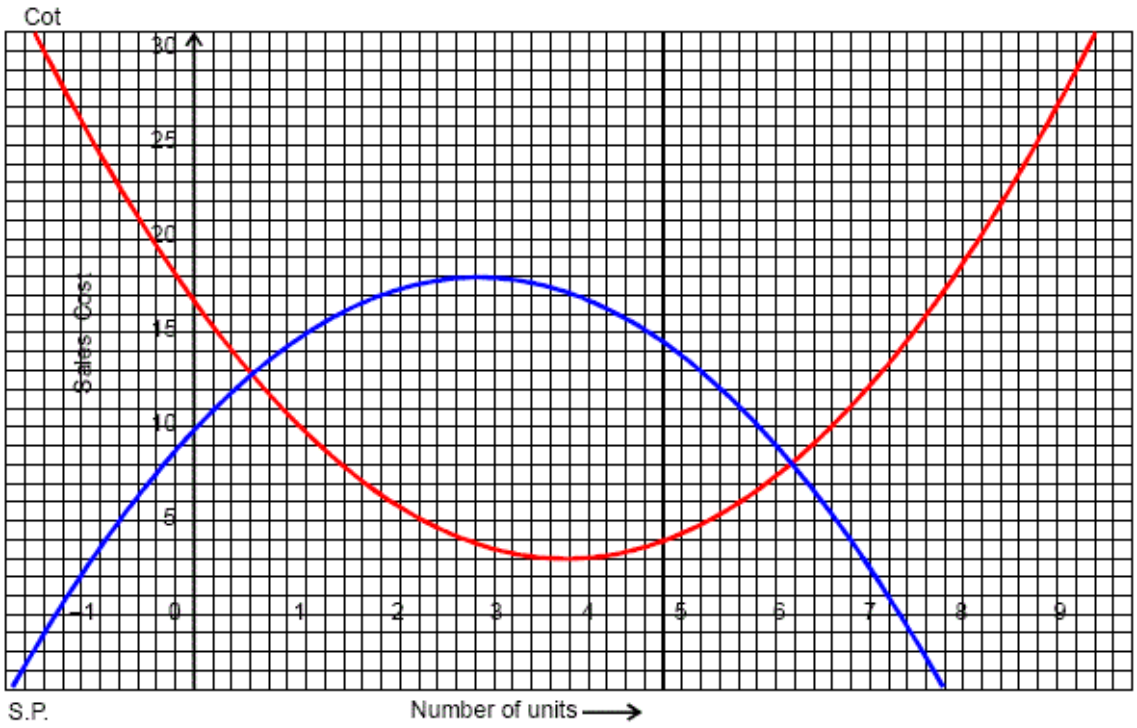
4 **538**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

First let us draw the graph of cost function and sales revenue function using the given expression.
In the figure given below, the red graph is the graph of the cost function and blue graph is the sales function.



The function of profit is $6x - x^2 + 8 - (x^2 - 8x + 18)$ i.e. $-2x^2 + 14x - 10$.
The intersection points of the graphs are the points where profit is zero i.e. $-2x^2 + 14x - 10 = 0$.
Solving this equation we get $x = 0.807$ or 6.192.

As can be seen from the graphs, company will make profit for those values of x, where sales graph is above the cost graph.
Now, as x is the packets having maximum 100 pieces, $x = 0.807$ or 6.192 means 80.7 pieces to 619.2 pieces.
Since manufactured pieces can be integral value only, so the integer values for which company makes profit are 81 to 619 i.e. 539 values.

FeedBack

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

A company 'ABC' is in the manufacturing business of gears for motor bikes. These gears after being manufactured were packed in a packet such that each packet has 100 pieces of gears. Total number of packets need not be an integer value, as the last packet may contain less than 100 pieces in it depending on the number of manufactured pieces,e.g, if company manufactures 340 pieces then number of packets will become 3.40. The cost (in '00 Rs.) and sales revenue (in '00 Rs.) of the company are given by two quadratic functions, as written below, where x represents the number of packets and $0 < x < 7$. Assume that all manufactured pieces are sold. The number of pieces manufactured by the company is an integer value always.

Profit earned by the company = Total sales – Total cost.
Cost function: $x^2 - 8x + 18$
Sales revenue function: $6x - x^2 + 8$

Q.56

If the company manufactured more than or equal to 400 pieces but less than 700 pieces, then how many pieces should it manufacture for the maximum profit?

1 **400**

2 **619**

3 **620**

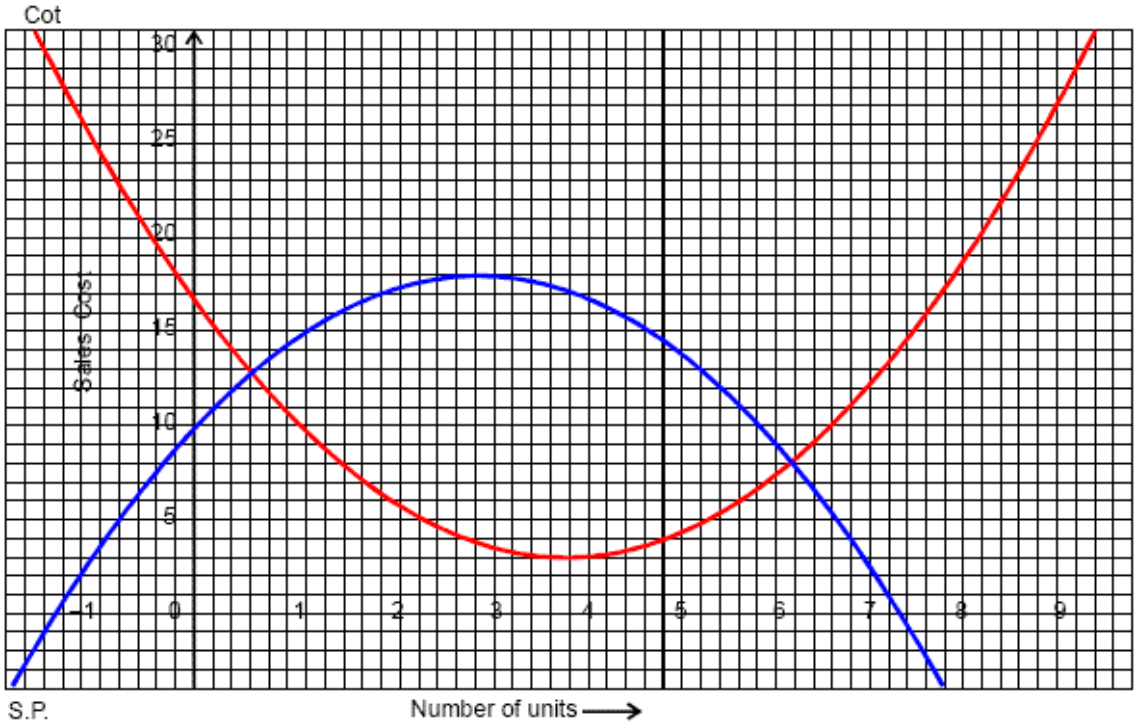
4 **699**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

First let us draw the graph of cost function and sales revenue function using the given expression.
In the figure given below, the red graph is the graph of the cost function and blue graph is the sales function.



The function of profit is $6x - x^2 + 8 - (x^2 - 8x + 18)$ i.e. $-2x^2 + 14x - 10$.
The intersection points of the graphs are the points where profit is zero i.e. $-2x^2 + 14x - 10 = 0$.
Solving this equation we get $x = 0.807$ or 6.192.

The minimum of cost function occurs at $x = 4$ i.e. at 400 pieces and the maximum of sales function occurs at $x = 3$ i.e. 300 pieces. Hence between 400 and 700 the sales price will keep decreasing but cost price will keep increasing and hence the profit is maximum at 400 pieces.

FeedBack

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

A company 'ABC' is in the manufacturing business of gears for motor bikes. These gears after being manufactured were packed in a packet such that each packet has 100 pieces of gears. Total number of packets need not be an integer value, as the last packet may contain less than 100 pieces in it depending on the number of manufactured pieces,e.g, if company manufactures 340 pieces then number of packets will become 3.40. The cost (in '00 Rs.) and sales revenue (in '00 Rs.) of the company are given by two quadratic functions, as written below, where x represents the number of packets and $0 < x < 7$. Assume that all manufactured pieces are sold. The number of pieces manufactured by the company is an integer value always.

Profit earned by the company = Total sales – Total cost.
Cost function: $x^2 - 8x + 18$
Sales revenue function: $6x - x^2 + 8$

Q.57
The maximum profit (in Rs.) the company can earn is

1 **350**

2 **1000**

3 **1400**

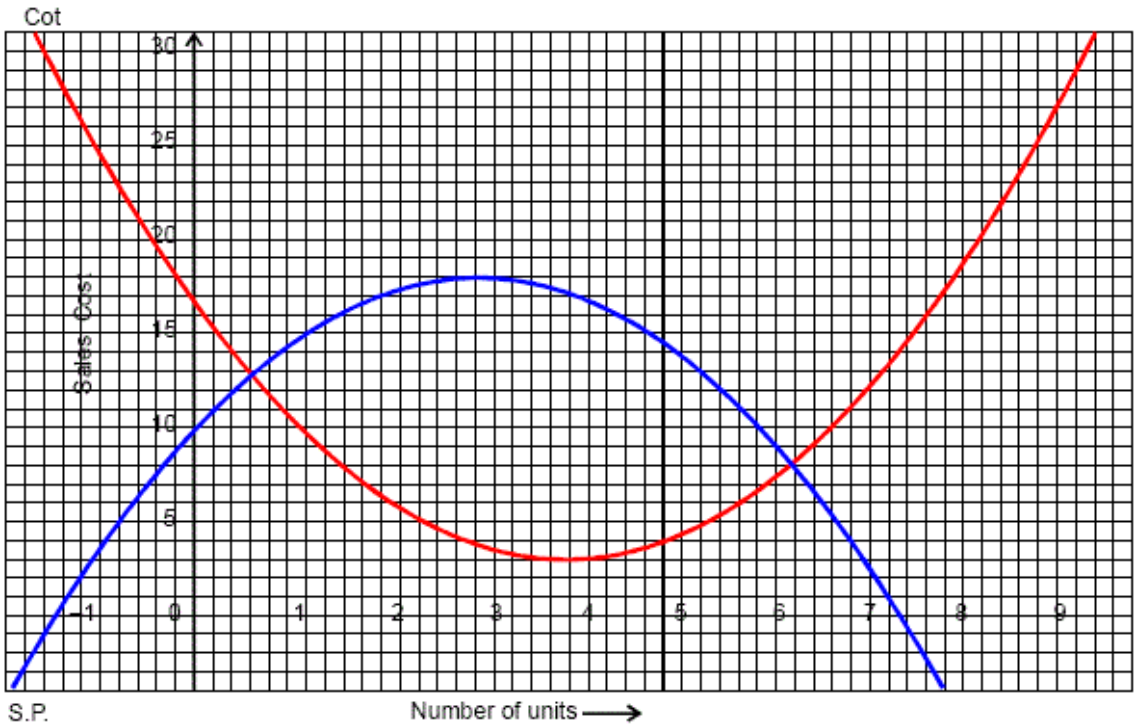
4 **1450**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

First let us draw the graph of cost function and sales revenue function using the given expression.
In the figure given below, the red graph is the graph of the cost function and blue graph is the sales function.



The function of profit is $6x - x^2 + 8 - (x^2 - 8x + 18)$ i.e. $-2x^2 + 14x - 10$.
The intersection points of the graphs are the points where profit is zero i.e. $-2x^2 + 14x - 10 = 0$.
Solving this equation we get $x = 0.807$ or 6.192.

The profit will be maximised when the function $-2x^2 + 14x - 10$ is maximised. It gets maximised at $x = 3.5$ i.e. 350 pieces.
Hence, the maximum profit is $-2 \times (3.5)^2 + 14 \times 3.5 - 10 = 14.5$ in 100's or Rs. 1450.

FeedBack

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

A company 'ABC' is in the manufacturing business of gears for motor bikes. These gears after being manufactured were packed in a packet such that each packet has 100 pieces of gears. Total number of packets need not be an integer value, as the last packet may contain less than 100 pieces in it depending on the number of manufactured pieces,e.g, if company manufactures 340 pieces then number of packets will become 3.40. The cost (in '00 Rs.) and sales revenue (in '00 Rs.) of the company are given by two quadratic functions, as written below, where x represents the number of packets and $0 < x < 7$. Assume that all manufactured pieces are sold. The number of pieces manufactured by the company is an integer value always.

Profit earned by the company = Total sales – Total cost.
Cost function: $x^2 - 8x + 18$
Sales revenue function: $6x - x^2 + 8$

Q.58
The profit earned by the company by manufacturing 280 pieces is same as that by manufacturing 'A' pieces. What is the value of 'A'?

1 **480**

2 **420**

3 **320**

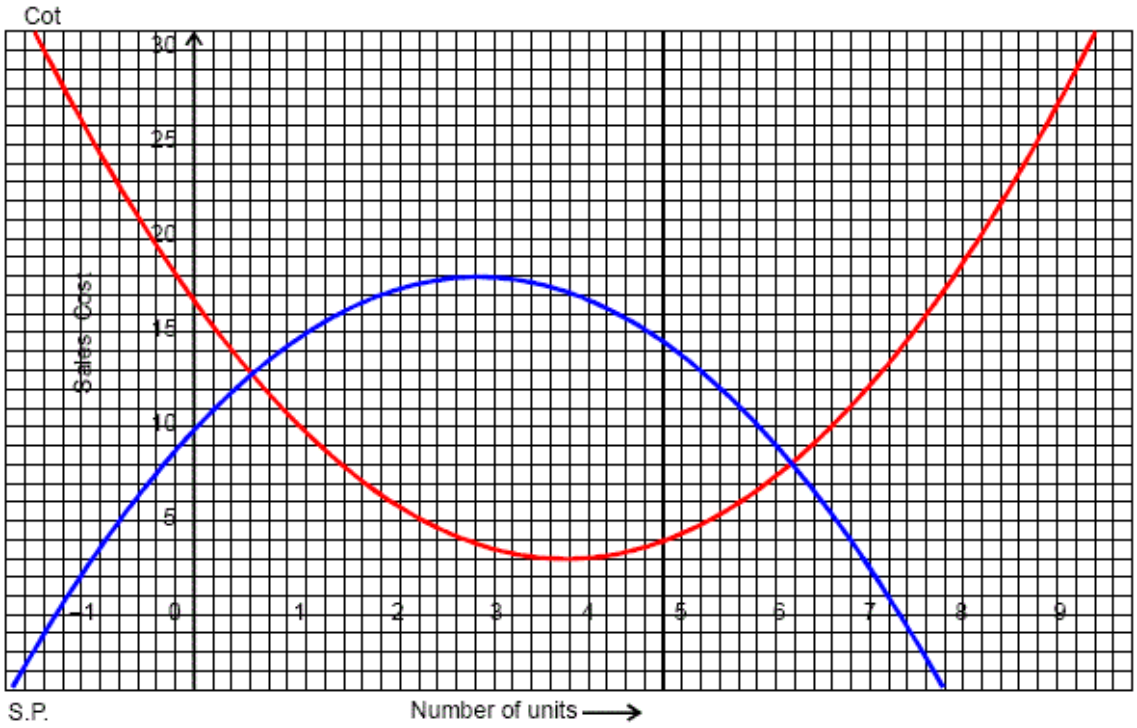
4 **None of these**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

First let us draw the graph of cost function and sales revenue function using the given expression.
In the figure given below, the red graph is the graph of the cost function and blue graph is the sales function.



The profit earned by the company by manufacturing 280 pieces = $-2(2.8)^2 + 14(2.8) - 10$.
Now suppose for x pieces the company will get the same profit.
Then $-2x^2 + 14x - 10 = -2(2.8)^2 + 14(2.8) - 10$.
Therefore, solving it we get $x = 4.2$ which means 420 pieces.

FeedBack

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

A boat racing competition was held at the Hussain Sagar Lake in Hyderabad in which a total of ten boats participated. Two ends of the lake - A and B - were tagged as start and reverse respectively. The starting point of the race is end A which is also the finishing point for the race, such that every boat has to start the race from A then row to the other end B of the lake and then row back to the end A without stopping at the end B. All the ten boats started from end A at the same time.
Some of the data related to the race is also known:
(i) The distance between the two ends of the lake was 2 km.
(ii) Speeds (in kmph) of all the ten boats were different from each other but the speed of each boat remains constant throughout the race.
(iii) The distance, from the end A, at which two boats are present at the same time is called the meeting point.

Q.59
Find the number of meetings, for all the boats taken together, at the meeting points during the race.

1 **10**

2 **25**

3 **45**

4 **55**

Solution:
Correct Answer : 3
As the speed of all the boats is different, the boat with maximum speed will meet all the other nine boats at nine different points while returning to the starting point from the endpoint.
In the same way boat with second maximum speed will meet the other eight boats only, as its meeting with the boat having highest speed is already counted in the previous case.
Similarly, the boat with second least speed will meet one boat.
Therefore, total meetings of the boat = 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 45

Bookmark

Answer key/Solution

FeedBack

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

A boat racing competition was held at the Hussain Sagar Lake in Hyderabad in which a total of ten boats participated. Two ends of the lake - A and B - were tagged as start and reverse respectively. The starting point of the race is end A which is also the finishing point for the race, such that every boat has to start the race from A then row to the other end B of the lake and then row back to the end A without stopping at the end B. All the ten boats started from end A at the same time.
Some of the data related to the race is also known:
(i) The distance between the two ends of the lake was 2 km.
(ii) Speeds (in kmph) of all the ten boats were different from each other but the speed of each boat remains constant throughout the race.
(iii) The distance, from the end A, at which two boats are present at the same time is called the meeting point.

Q.60

Find the minimum possible number of meeting points in the lake.

1 **45**

2 **22**

3 **17**

4 **9**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Suppose boat with highest speed was meeting all other nine boats at points which are at a distance of a, b, c, ..., i respectively from end A of the lake.
Let speed of boats be $x_1, x_2, ..., x_{10}$ such that $x_1 > x_2 >, ..., x_{10}$.
So, boats with speed x_1 and x_2 will meet each other at distance 'a' when boat with speed x_1 is returning towards end A and boat with speed x_2 is going towards end B.
time taken by boat with speed x_1 to reach the meeting point = time taken by boat with speed x_2

i.e, $\frac{2-a}{x_1} = \frac{a}{x_2} \Rightarrow \frac{2-a}{a} = \frac{x_1}{x_2}$

Now let us assume that boat with speed x_2 and x_3 also meets at the point which is at 'a' distance from end A.
So, time taken of these two boats should be equal

i.e, $\frac{2-a}{x_2} = \frac{a}{x_3} \Rightarrow \frac{2-a}{a} = \frac{x_2}{x_3} = \frac{x_1}{x_2}$

Similarly, for minimum meeting points ratio of the consecutively positioned boats should be the same.
Now the meeting points of the other boats can be superimposed with the nine meeting points.
So, the minimum number of meeting points can be 9.

FeedBack

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

A boat racing competition was held at the Hussain Sagar Lake in Hyderabad in which a total of ten boats participated. Two ends of the lake - A and B - were tagged as start and reverse respectively. The starting point of the race is end A which is also the finishing point for the race, such that every boat has to start the race from A then row to the other end B of the lake and then row back to the end A without stopping at the end B. All the ten boats started from end A at the same time.
Some of the data related to the race is also known:
(i) The distance between the two ends of the lake was 2 km.
(ii) Speeds (in kmph) of all the ten boats were different from each other but the speed of each boat remains constant throughout the race.
(iii) The distance, from the end A, at which two boats are present at the same time is called the meeting point.

Q.61

If the meeting points in the lake were minimum possible and the speed of the fastest and the second fastest boats were 10 kmph and 8 kmph respectively, then find the speed of the boat having 4th highest speed.

1 **6.4 kmph**

2 **6 kmph**

3 **5.12 kmph**

4 **4 kmph**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

As for minimum meeting points ratio of the consecutively positioned boats should be the same.
Ratio of the boats having highest and second highest speed = 10 : 8 = 5: 4

So, speed of third positioned boat = $\frac{x_2}{x_3} = \frac{x_1}{x_2} = \frac{8}{5} \times 4 = 6.4$ kmph

Speed of the boat at forth position = $\frac{6.4}{5} \times 4 = 5.12$ kmph

FeedBack

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

A boat racing competition was held at the Hussain Sagar Lake in Hyderabad in which a total of ten boats participated. Two ends of the lake - A and B - were tagged as start and reverse respectively. The starting point of the race is end A which is also the finishing point for the race, such that every boat has to start the race from A then row to the other end B of the lake and then row back to the end A without stopping at the end B. All the ten boats started from end A at the same time.
Some of the data related to the race is also known:
(i) The distance between the two ends of the lake was 2 km.
(ii) Speeds (in kmph) of all the ten boats were different from each other but the speed of each boat remains constant throughout the race.
(iii) The distance, from the end A, at which two boats are present at the same time is called the meeting point.

Q.62
Suppose the meeting points of the boat having highest speed with the boats having 2nd highest speed, 3rd highest speed, 4th highest speed,...., lowest speed, are numbered as 1st, 2nd, 3rd,..., 9th respectively.

If the meeting points in the lake were minimum possible, then at which meeting point there will be exactly 5 meetings?

1 **5th**

2 **4th**

3 **2nd**

4 **1st**

Solution:
Correct Answer : 1
At the first meeting point, there were exactly 9 meetings.
At the second meeting point, there were exactly 8 meetings.
At the third meeting point, there were exactly 7 meetings.
At the fourth meeting point, there were exactly 6 meetings.
At the fifth meeting point, there were exactly 5 meetings

FeedBack

Bookmark

Answer key/Solution

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

A newspaper agency conducted a survey in which a reader has to select his first three preferences of newspapers, out of the five newspapers - Rajdhani News (RN), Dainik Khabre (DK), Times of Capital (TC), Rajdhani Express (RE) and Din Raat (DR). According to a reader's choice, 5, 3 and 2 points are awarded to the newspaper selected by him at first, second and third preference respectively. It is also known that every newspaper is selected as the first preference by the equal number of readers. The total points awarded to the five newspapers in this survey are tabulated below. Some of the cells in the following table are left blank intentionally.

Name of the Newspaper	Total Points
Rajdhani News (RN)	150
Dainik Khabre (DK)	-
Times of Capital (TC)	128
Rajdhani Express (RE)	142
Din Raat (DR)	-

Q.63
If the total points awarded, out of the five newspapers, is not maximum for RN, then find the minimum number of readers covered in the survey.

1 **80**

2 **75**

3 **65**

4 **56**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3
If RN is a not a newspaper with maximum number of points, either DK or DR should have maximum points. Let DK got maximum points.
For minimum number of readers DR must get least points.
As every paper was selected as first preference by equal number of readers, we can say that it got only points which it got as first preference.
Let the points of DR = 5x
As sum of the points given by a reader are 10.
Sum of the total points must be a multiple of 10.
Sum of the points of the newspaper whose points is given = 420.
So, sum of the points of DK and DR must also be a multiple of 10.
As number of points of DR is a multiple of 5, number of points of DK must also be a multiple of 5.
Let the points got by DK = y
As half of the points is because of first preference, total number of points because of first preference = 5x × 5 = 25x Or, total number of points given by readers = 25x × 2 = 50x
Hence, 420 + y + 5x = 50x
Or, 45x = 420 + y
Minimum value of y for getting integer value of x = 165.
X = 13.
Therefore minimum number of points = 420 + 165 + 65 = 650.
So minimum number of readers covered = 650/10 = 65.

FeedBack

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

A newspaper agency conducted a survey in which a reader has to select his first three preferences of newspapers, out of the five newspapers - Rajdhani News (RN), Dainik Khabre (DK), Times of Capital (TC), Rajdhani Express (RE) and Din Raat (DR). According to a reader's choice, 5, 3 and 2 points are awarded to the newspaper selected by him at first, second and third preference respectively. It is also known that every newspaper is selected as the first preference by the equal number of readers. The total points awarded to the five newspapers in this survey are tabulated below. Some of the cells in the following table are left blank intentionally.

Name of the Newspaper	Total Points
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Dainik Khabre (DK)	-
Times of Capital (TC)	128
Rajdhani Express (RE)	142
Din Raat (DR)	-

Q.64
If Dainik Khabre is the newspaper with the maximum total points and the readers covered in the survey is minimum possible, then the total points awarded to Din Raat cannot be more than

1 **55**

2 **59**

3 **69**

4 **79**

Solution:
Correct Answer : 4
As solved in the last question for minimum number of readers, sum of the points got by DK and DR = 165 + 65 = 230.
Minimum number of points with DK for 1st position = 151
Therefore maximum points got by DR = 230 – 151 = 79

FeedBack

Bookmark

Answer key/Solution

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

A newspaper agency conducted a survey in which a reader has to select his first three preferences of newspapers, out of the five newspapers - Rajdhani News (RN), Dainik Khabre (DK), Times of Capital (TC), Rajdhani Express (RE) and Din Raat (DR). According to a reader's choice, 5, 3 and 2 points are awarded to the newspaper selected by him at first, second and third preference respectively. It is also known that every newspaper is selected as the first preference by the equal number of readers. The total points awarded to the five newspapers in this survey are tabulated below. Some of the cells in the following table are left blank intentionally.

Name of the Newspaper	Total Points
Rajdhani News (RN)	150
Dainik Khabre (DK)	-
Times of Capital (TC)	128
Rajdhani Express (RE)	142
Din Raat (DR)	-

Q.65
If Rajdhani News is the paper with maximum points, then find the range of the people who covered in the survey.

1 **From 60 to 70**

2 **From 55 to 70**

3 **From 54 to 71**

4 **From 53 to 65**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
As solved in the first question.
Let the number of points as of first preference to each of the five papers = 5x.
Let the sum of the points to DK and DR = y
Now y > 5x + 5x = 10x and y < 300
(420 + y)/2 = 25x
50x = 420 + y
Minimum possible value of y for satisfying all conditions = 130
Maximum possible value of y for satisfying all conditions = 280
Hence, range of total points in the survey is (420 + 130 = 550) to (420 + 280 = 700)
Therefore range of the readers who were covered in the survey is (550/10 = 55 to 700/10 = 70), i.e. the range is 55 – 70.

FeedBack

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

A newspaper agency conducted a survey in which a reader has to select his first three preferences of newspapers, out of the five newspapers - Rajdhani News (RN), Dainik Khabre (DK), Times of Capital (TC), Rajdhani Express (RE) and Din Raat (DR). According to a reader's choice, 5, 3 and 2 points are awarded to the newspaper selected by him at first, second and third preference respectively. It is also known that every newspaper is selected as the first preference by the equal number of readers. The total points awarded to the five newspapers in this survey are tabulated below. Some of the cells in the following table are left blank intentionally.

Name of the Newspaper	Total Points
Rajdhani News (RN)	150
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Times of Capital (TC)	128
Rajdhani Express (RE)	142
Din Raat (DR)	-

Q.66
If Times of Capital is the newspaper with minimum points, then find the minimum readers covered in the survey.

1 **72**

2 **70**

3 **65**

4 **54**

Solution:
Correct Answer : 2
As solved in the last question
50x = 420 + y
Minimum possible value of y should be 280.
Therefore, minimum number of reader covered in the survey = 70.

FeedBack

Bookmark

Answer key/Solution

Sec 3

Q.67
The equations for four lines are given as: x + 2y − 3 = 0, 3x + 4y − 7 = 0, 2x + 3y − 4 = 0 and 4x + 5y − 6 = 0. What can be said about these four lines?

1 Concurrent

2 Are sides of a parallelogram

3 Are sides of a square

4 None of these

Solution:
Correct Answer : 4
If we observe the options, we can say to check for these properties we will be needing point of intersection of these lines and slopes.
Step 1: Let us find the point of intersection of x + 2y − 3 = 0 and 2x + 3y − 4 = 0
Solving the two equations, we get the point of intersection as (−1, 2).
Step 2: Let us check whether the point (−1, 2) lies on the line 4x + 5y − 6 = 0
Substituting values of x and y as −1 and 2 respectively, we get 4(−1) + 5(2) − 6 = 0.
Substituting the values of x and y satisfied the equation and hence the point of intersection lies on this line as well.
Step 3: Let us check whether the point (−1, 2) lies on the line 3x + 4y − 7 = 0.
Substituting values of x and y as −1 and 2 respectively, we get 3(−1) + 4(2) − 7 = −2.
Since four lines can be concurrent only when all four of them intersect at the same point.
All 4 lines do not pass through the same point, and hence the four lines are NOT concurrent.
As three of the lines pass through one point they cannot form sides of a quadrilateral, so cannot form a parallelogram or square also.

FeedBack

Bookmark

Answer key/Solution

Q.68

Kashish invested two equal amounts at 7.5% and 7% rate of simple interest. If the difference between the interests earned on these two investments after 8 years is Rs. 400, then find the total amount (in Rs) invested by Kashish.

Solution:

Correct Answer : 20000

Let the total amount invested be 2x.

Then, $\frac{x \times 7.5 \times 8}{100} - \frac{x \times 7 \times 8}{100} = 400 \Rightarrow \frac{4x}{100} = 400 \Rightarrow x = 10000$

$\therefore$ Total amount invested = 2x = Rs. 20000.

FeedBack

Bookmark

Answer key/Solution

Q.69

If a and b are the roots of the quadratic equation: $x^2 - 3x + 9 = 0$, then find the quadratic equation having its roots as a^2 and b^2.

1 **$x^2 + 18x - 81 = 0$**

2 **$x^2 + 9x + 81 = 0$**

3 **$x^2 - 9x + 81 = 0$**

4 **Cannot be determined**

Solution:

Correct Answer : 2

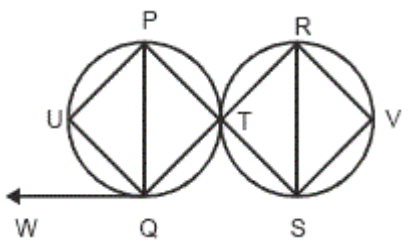
As 'a' and 'b' are roots of the quadratic equation $x^2 - 3x + 9 = 0$,
$a + b = 3$, $ab = 9$
So, $a^2 + b^2 = (a + b)^2 - 2ab$
The desired quadratic equation is $x^2 - x(a^2 + b^2) + a^2 b^2 = 0$.
$\therefore$ Equation is $x^2 + 9x + 81 = 0$.

FeedBack

Bookmark

Answer key/Solution

Q.70



Triangle PTQ and triangle TRS, as shown in the above figure, are isosceles with PQ and RS as their bases. Also, $\angle PTQ + \angle RVS = 180°$, $\angle PTQ = 2\angle RVS$, $\angle UQW = 75°$. If WQ is a tangent to the circle at point Q, then find $\angle UQP$.

1 **15°**

2 **45°**

3 **50°**

4 **60°**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

$\angle PTQ = 2\angle RTS$
$\angle PTQ + \angle RVS = 180°$
$\therefore \angle RVS = 60°, \angle PTQ = 120° = \angle RTS$

$\angle QPT = \angle PQT = \angle TRS = \angle TSR = \frac{180 - 120}{2} = 30°$

ΔPTQ and ΔRTS are similar.
$\angle UQW = \angle UPQ = 75°$ (alternate segment theorem)
$\therefore \angle UPT + \angle UQT = 180°$ (opposite angles in cyclic quadrilateral)
$\Rightarrow \angle UPQ + \angle QPT + \angle UQP + \angle PQT = 180°$
$\Rightarrow \angle UQP = 45°$

FeedBack

Q.71

A rope, 10 feet 2 inches long, has to be cut down into 20 pieces in such a way that some pieces are 9 inches long and others are 4 inches long. If 2 inches is allowed for sawing waste and remaining is used completely, then how many pieces of the respective lengths were cut?

1 **9, 11**

2 **8, 12**

3 **15, 5**

4 **10, 10**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Board is 10 feet 2 inches long.
As 1 foot = 12 inches
10 feet = 120 inches
Total length of board = 122 inches.
Now 2 inches is allowed for sawing waste, so remaining length = 120 inches
Let x and y be the number of pieces having length 9 inches and 7 inches respectively.
$\therefore \quad 9x + 4y = 120 \quad \ldots (i)$
and $x + y = 20 \quad \ldots (ii)$
Solving both these equations, we get
$x = 8, y = 12$

FeedBack

Q.72

Simplify the following expression:

$$\frac{\left(x^{2^{2n-1}}+y^{2^{2n-1}}\right)\left(x^{2^{2n-1}}-y^{2^{2n-1}}\right)}{x^{2^{2n}}-y^{2^{2n}}}.$$

1 **1**

2 **$x^n + y^n$**

3 **$x^{2n} - y^{2n}$**

4 **$x^{2n} + y^{2n}$**

Solution:
Correct Answer : 1

Numerator = $\left(x^{2^{2n-1}}\right)^2-\left(y^{2^{2n-1}}\right)^2 = x^{2^{2n}}-y^{2^{2n}}$ and Denominator = $x^{2^{2n}}-y^{2^{2n}}$

$\therefore \frac{\text{Numerator}}{\text{Denominator}} = 1.$

FeedBack

Bookmark

Answer key/Solution

Q.73

Deepti said to Bhavya, "When 10 times the month number of my birth added to 12 times the date of my birth, the result comes out to be 388". On which of the following days could Deepti be celebrating her birthday?

1 **29th March**

2 **31st April**

3 **29th September**

4 **24th October**

Solution:
Correct Answer : 4

Let date of birth be d and month be m, then $1 \le d \le 31$ and $1 \le m \le 12$.
Also, $10m + 12d = 388$
$\Rightarrow 5m + 6d = 194$
Possible values of m and d which satisfy the given equation are:
m = 4, d = 29 and
m = 10, d = 24
$\therefore$ Possible birthdays for Deepti are 29th April or 24th October.

FeedBack

Bookmark

Answer key/Solution

Q.74

If $(x + 2)^2 = 9$ and $(y + 3)^2 = 25$, then the maximum value of x/y is

1 **5/8**

2 **1/2**

3 **5/2**

4 **2/1**

Solution:

Correct Answer : 1

$(x + 2)^2 = 9$
$\Rightarrow x + 2 = \pm 3 \Rightarrow x = 1$ or -5
and $(y + 3)^2 = 25$
$\Rightarrow y + 3 = \pm 5 \Rightarrow y = 2$ or -8

Therefore, maximum value of $\frac{x}{y} = \frac{-5}{-8} = \frac{5}{8}$.

FeedBack

Bookmark

Answer key/Solution

Q.75

Two merchants - A and B - each sell an article for Rs.1000. If merchant A computes his profit on cost price while merchant B computes his profit on selling price, then both ended up on making an individual profit of 25%. By how much rupees is the profit made by merchant B greater than that of merchant A?

Solution:

Correct Answer : 50

Bookmark

Answer key/Solution

Merchant B computes his profit as a percentage of selling price. He makes a profit of 25% on selling price of Rs.1000.
i.e. his profit = 25% of 1000 = Rs.250
Merchant A computes his profit as a percentage of cost price.
Therefore, when he makes a profit of 25% or 1/4th of his cost price, and selling price is Rs. 1000 then, cost price = Rs. 800.
∴ Profit made by Merchant A = Rs. 200
So, Merchant B makes a profit of Rs.250 and Merchant A makes a profit of Rs.200
Hence, Merchant B makes Rs.50 more profit than Merchant A.

FeedBack

Q.76

ABCDEF is a regular hexagon. Find the ratio of the area of the triangle formed by joining the midpoints of the sides of the triangle ACE to that of the hexagon ABCDEF.

1 **1 : 2**

2 **1 : 4**

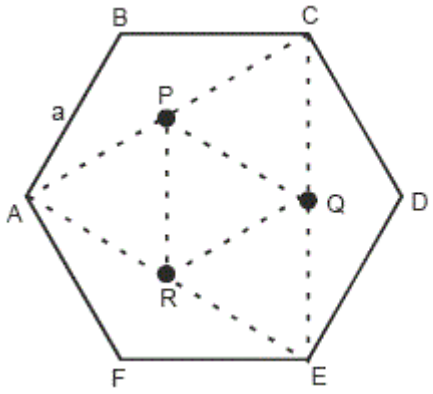
3 **1 : 8**

4 **2 : 3**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution



$Ar(\Delta PQR) = \frac{1}{4} Ar(\Delta ACE)$ [Because when we draw a triangle by jointing the mid-points of the sides of a triangle, then four regions so formed all have equal areas.]

In ΔABC, applying cosine formula

$AC^2 = AB^2 + BC^2 - 2 \cdot AB \cdot BC \cdot \cos B$

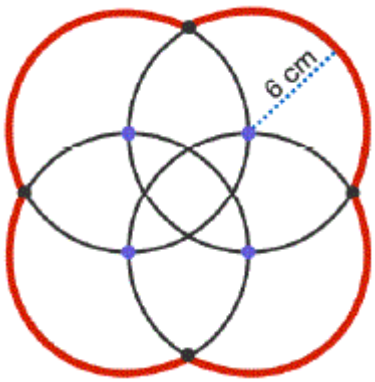
$\therefore AC^2 = a^2 + a^2 + 2a^2 \times \frac{1}{2} = 3a^2 \Rightarrow AC = \sqrt{3}a$

$\therefore \frac{\text{Area of } \Delta PQR}{\text{Area of ABCDEF}} = \frac{\frac{1}{4} \times \frac{\sqrt{3}}{4} \times \left(\sqrt{3}a\right)^2}{6 \times \frac{\sqrt{3}}{4} a^2} = \frac{1}{8}$

FeedBack

Q.77

All the four circles, shown in the figure given below, are congruent having radius 6 cm and every two adjacent circles pass through the centre of another circle. What is the perimeter of the red curve in the given figure?



1 **16π**

2 **18π**

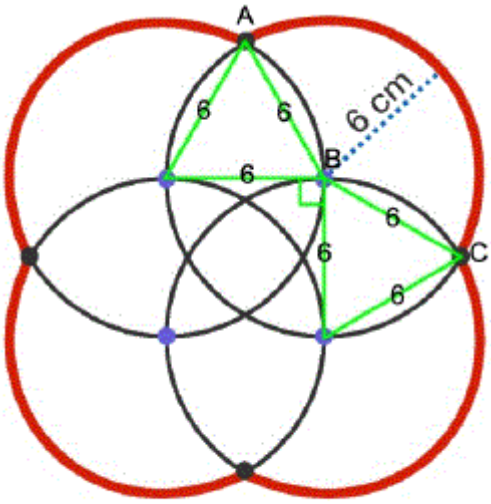
3 **20π**

4 **24π**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution



∠ABC = 360° – 90° – 60° – 60° = 150°
∴ Total red curve = 4×(150°/360°) × 2π × 6 = 20π

FeedBack

Q.78
A student was asked to find the 3/7th of a number but he instead multiplied it by 7/3. As a result, he got an answer which was more than the correct answer by 1680. What was the number?

Solution:
Correct Answer : 882

Bookmark

Answer key/Solution

Let the number be x.

He was asked to find $\frac{3}{7}x$, but he instead multiplied x by $\frac{7}{3}$ i.e. $\frac{7x}{3}$

$\therefore \quad \frac{7}{3}x - \frac{3}{7}x = 1680 \Rightarrow x = 882.$

FeedBack

Q.79
Anil spent 16.67% of his income on rent, 25% of the remaining on food, 60% of then remaining on education. If he is still able to save Rs. 4500 per month, then find his monthly income(in Rs.).

1 **16000**

2 **17000**

3 **18000**

4 **19000**

Solution:
Correct Answer : 3

Let his income be x.

He spent 16.66% i.e. $\frac{1}{6}$ of his income on rent

$\therefore$ Remaining = $\frac{5}{6}x$.

Now, he spent 25% of this remaining on food.

So, now remaining income after spending on food = 75% of $\frac{5x}{6}$.

On education he spent 60% of the remaining.

So now he is left with 40% of 75% of $\frac{5x}{6}$.

$\therefore \quad \frac{40}{100} \times \frac{3}{4} \times \frac{5x}{6} = 4500 \Rightarrow x = 18000.$

FeedBack

Bookmark

Answer key/Solution

Q.80

A and B invested in a business in the ratio 3 : 2. If 5% of the total profit earned in the business goes to charity and A's share of profit is Rs 855, then the total profit (in Rs.) earned is

1 **1425**

2 **1500**

3 **1537.5**

4 **1576**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

	A	:	B
Investment ratio	3	:	2

Investment ratio and profit ratio will remain same.
So, profit ratio is also 3 : 2.
Let total profit be 5x.
Now, 5% of the total profit goes to charity.

$\therefore$ The sum i.e. the profit which will be divided between A and B is $\frac{95}{100} \times 5x = \frac{19x}{4}$.

$\therefore$ A's share = $\frac{3}{5} \times \frac{19x}{4} = 855$

$\Rightarrow$ x = 300
$\therefore$ Total profit = 5 × 300 = 1500.

FeedBack

Q.81
Find the sum of all possible solutions of the equation $(x^2 + 5x + 5)^{(x^2 - 10x + 21)} = 1$.

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Case 1: As $a^0 = 1$, so $x^2 - 10x + 21 = 0$ when $(x^2 + 5x + 5) \neq 0$ will give us the results
Hence, x = 3, 7
Case 2: $1^{\text{any real number}} = 1 \Rightarrow x^2 + 5x + 5 = 1 \Rightarrow x = -1, -4$.
Case 2: $(-1)^{\text{even}} = 1 \Rightarrow x^2 + 5x + 5 = -1 \Rightarrow x = -2, -3$. But x = –2 will not make $x^2 - 10x + 21$ even.
So, the only permissible values of x are 3, 7, –1, –4 and –3.
Hence, their sum = 3 + 7 – 1 – 4 – 3 = 2

FeedBack

Q.82
If 6 fair coins are tossed, then what is the probability that there will be more heads than tails?

1 **1/2**

2 **31/64**

3 **1/3**

4 **11/32**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Case 1: When all coins show heads

Probability = $\left(\frac{1}{2}\right)^6$.

Case 2: When 5 are head, and 1 is tails = ${}^6C_5 \times \left(\frac{1}{2}\right)^5 \times \left(\frac{1}{2}\right)$

Case 3: When 4 are head and 2 are tail = ${}^6C_4 \times \left(\frac{1}{2}\right)^4 \times \left(\frac{1}{2}\right)^2$

$\therefore$ Probability = $\frac{1}{64} + \frac{6}{64} + \frac{15}{64} = \frac{22}{64} = \frac{11}{32}$

FeedBack

Q.83

Abhay, a CAT aspirant, decided to work on his calculations. So he started multiplying 4 consecutive Natural numbers and noting them down on a paper. Which of the following numbers could not be the number written by Abhay?

1 **360**

2 **5040**

3 **5047**

4 **7920**

Solution:
Correct Answer : 3
A number formed by the product of four consecutive numbers must be divisible by 4, but only 24023 is not a multiple of 4 among the given options.

Bookmark

Answer key/Solution

FeedBack

Q.84

If m, n and p are in an Arithmetic Progression (AP), then m^{th}, n^{th}, and p^{th} terms of that AP are in

1 **AP**

2 **GP**

3 **HP**

4 **None of these**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

Given m, n and p are in AP
$\Rightarrow n - m = p - n = k$ (say)
$\therefore n = m + k, p = m + 2k$
Consider an AP
$a_1\ a_2\ a_3$ ... whose common difference is 'd'
As $a_m + d = a_{m+1}$ [a_m is mth term],
So, $a_m + kd = a_{m+k} = a_n$ ($\because n = m + k$)
Also, $a_m + 2kd = a_m + 2k = a_p$ ($\because p = m + 2k$)
$a_p - a_n = [a_m + 2kd] - [a_m + kd) = kd$
$\therefore a_n - a_m = a_p - a_n = kd$
$\therefore a_m\ a_n\ a_p$ are in AP.

Alternative method:
As m, n and p are in AP
So, $n - m = p - n = k$ (let say)
$\therefore\ n = m + k$
$p = n + k = m + 2k$
Let a and d be the first term and the common difference of AP respectively.
$\therefore$ m^{th} term of an AP $= a + (m - 1)d$
n^{th} term of an AP $= a + (m + k - 1)d$ [$\because n = m + k$]
p^{th} term of an AP $= a + (m + 2k - 1)d$ [$\because p = m + 2k$]
So, $(n^m - m^n)$ term $= Kd$ and $(p^m - n^m)$ term $= Kd$.
As the difference is common. Hence, these three terms also form an AP.

FeedBack

Q.85

On a particular day, a salesman sold 3 types of toys. Each toy of the 3 varieties sells at Rs. 100, Rs. 50 and Rs. 25 respectively. If the total sales on that day was of Rs. 300 and that salesman sold at least one toy of each variety, then find the maximum number of toys he could have sold on that day.

Solution:
Correct Answer : 8

Bookmark

Answer key/Solution

Let x, y and z be the number of toys he sold of 1st, 2nd and 3rd varieties respectively on that day.
$\therefore\ 100x + 50y + 25z = 300$
To find the maximum number of toys he could have sold, x and y has to be minimum.
$\therefore\ x = 1, y = 1, z = 6$
so, maximum toys sold = 8

FeedBack

Q.86

Three different alloys, of copper and iron, have the two elements in the ratio 3 : 5, 3 : 7 and 12 : 5 respectively. If 8 kg of the first alloy and 30 kg of the second alloy are taken, then how much quantity (in kg) of the third alloy should be taken so that the ratio of copper and iron in the final mixture is 1 : 1?

1 **51**

2 **34**

3 **68**

4 **85**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Quantity of Copper and Iron from 1st alloy is 3 kg and 5 kg, while from 2nd alloy is 9 kg and 21 kg. So after mixing both the alloys the quantity of copper and Iron becomes 12 kg and 26 kg respectively. Let the quantity of 3rd alloy is 17a

So, we can say that $\frac{12+12a}{26+5a}=\frac{1}{1}$

$12 + 12a = 26 + 5a \Rightarrow 7a = 14 \Rightarrow a = 2$

So, the quantity required of 3rd alloy is 34 kg.

FeedBack

Q.87

The average age of husband, wife and their child 3 years ago from now was 27 years and that of wife and child 5 years ago from now was 20 years. The age (in years) of the husband 5 years ago from now was

Solution:
Correct Answer : 35

Bookmark

Answer key/Solution

Let the age of husband, wife and child be h, w and c years respectively.

Then, $\frac{h+w+c-9}{3}=27$ and $\frac{w+c-10}{2}=20$

By solving these two equations, we get h = 40 years.

So, 5 years ago, age of husband equals to 35 years.

FeedBack

Q.88

How many 9-digit numbers can be formed using the digits 6 and 7 only, so that the number so formed is multiple of 12?

1 **43**

2 **35**

3 **42**

4 **29**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

For any number to be a multiple of 12, it has to be divisible by 3 and 4 both.
So, for divisibility of any number by 4, the last 2 digits should be divisible by 4.
So by using 6 and 7 only possible case is of 76 as its last 2 digit.
Further the digits 7 and 6 should be used such that the sum of the digits of the so formed number has to be multiple of 3.
So possible cases are:
when the number have 3 digits as 6, and 6 digits as 7, e.g 7777776676 i.e.
or when the number have 3 digits as 7, and 6 digits as 6, e.g 776666676
So, 21 cases with each pair means 42 possible number are there.

FeedBack

Q.89

If $h(x) = k^x$, where k is any real number, then which of the following is/are true?

1 **$h(x + 2) - 2h(x + 2)\,(h(-1)) + h(x)\,h(0) = (k - 1)^2\,h(x)$**

2 **$h(x + 1)\,h(x - 1) = (h(x))^2$**

3 **$h(x)\,h(-x) = 1$**

4 **All of these**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Consider
Option (a) : $k^{x+2} - 2k^{x+2}k^{-1} + k^xk^0 = k^x(k^2 - 2k + 1)$
$= (k - 1)^2\,k^x = (k - 1)^2h(x) \rightarrow$ TRUE
Option (b) : $h(x + 1)h(x - 1) = k^{x+1}k^{x-1} = k^{2x} = (k^x)^2 = (h(x))^2 \rightarrow$ TRUE
(c) $h(x)h(-x) = k^xk^{-x} = 1 \rightarrow$ TRUE
Hence all options are true.

FeedBack

Q.90

In an acute-angled triangle, thirteen times an angle is equal to 17 times another. The angles (in degrees) of the triangle are all integers. If the third angle is less than or equal to 30°, then the difference between the first two angles (in degrees) is

Solution:

Correct Answer : 20

Bookmark

Answer key/Solution

Let the three angles be A, B and C such that
13A = 17B

$$A = \frac{17}{13}B$$

The angles are acute so the following values are possible:

A	B	C	
17	13	>90	Not possible
34	26	>90	Not possible
51	39	90	Not possible (As $C \leq 30°$)
68	52	60	Not Possible
85	65	30	Possible
>90	78		Not possible

$\therefore$ Least angle is 30°.

And the required Difference = 85 – 65 = 20°

FeedBack

Q.91

If M = 40! and N = 43, then find the remainder when M is divided by N.

Solution:

Correct Answer : 21

Bookmark

Answer key/Solution

$$\frac{42!}{43} \to R = 42 \quad \text{(Wilson's Theorem)}$$

$$\Rightarrow \frac{41! \times 42}{43} \to R = 42 \Rightarrow \frac{41!}{43} \to R = 1$$

$$\Rightarrow \frac{40! \times 41}{43} \to R = 1 = -42$$

$$\Rightarrow \frac{40!}{43} \to R = 21 \qquad \left(\because \frac{41}{43} \to R = 41 = -2\right)$$

FeedBack

Q.92

A circular track is marked with numbers from 1 to 15 so as to divide the track into 15 equal parts. Two runners started simultaneously from the point marked as 1 and run in opposite directions. After running for several hours, they noticed that they cross each other only at these 15 marked points and also that they crossed each other at each of these 15 points at least once. Which of the following is a possible value of the ratio of the speeds of the faster runner to the speed of the slower runner?

1 **2.75**

2 **2**

3 **1.5**

4 **All are possible**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

As both the runners are running in opposite directions, so the addition of the ratio of their speeds will give their total meeting points.
Checking options

(1) $2.75 = \frac{11}{4} \Rightarrow$ 15 meeting points i.e 11 + 4

(2) $2 = \frac{2}{1} \Rightarrow$ 3 meeting points

(3) $1.5 = \frac{3}{2} \Rightarrow$ 5 meeting points

FeedBack

Q.93
Find the complete range of values of x for which $(x^2 - x + 1)^x < 1$.

1 **$(-\infty, 0)$**

2 **$(0, 1)$**

3 **$(-\infty,0) \cup (0,1)$**

4 **$(0, 1) \cup (1, \infty)$**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

$(x^2 - x + 1)^x < 1$
$\Rightarrow x \log(x^2 - x + 1) < \log 1$
$\Rightarrow x \log(x^2 - x + 1) < 0 \quad (\because \log 1 = 0)$
Case (i):
$x < 0$ and $\log(x^2 - x + 1) > 0$
$\Rightarrow x^2 - x + 1 > 1$
$\Rightarrow x(x - 1) > 0$
$\Rightarrow x \in (-\infty,0) \cup (1,\infty)$
As $x < 0$, the solution in the case is $(-\infty,0)$
Case (ii):
$x > 0$ and $\log (x^2 - x + 1) < 0$
$\Rightarrow x^2 - x + 1 < 1$
$\Rightarrow x(x - 1) < 0$
$\Rightarrow 0 < x < 1$
So $0 < x < 1$ in this range
Combining both cases,
we get the solutions as $(-\infty,0) \cup (0,1)$

FeedBack

Q.94

P and Q can complete a task either by P working for 6 days and then Q working for 8 days or by P working for 3 days and then Q working for 16 days. In how many days can P and Q together complete twice the amount of task?

1 **14**

2 $8\frac{1}{3}$

3 $6\frac{6}{11}$

4 $13\frac{1}{11}$

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

As the work can be completed by P working for 6 days and then Q working for 8 days or P working for 3 days and then Q working for 16 days.
So we can conclude that the work done by P in 3 days is equivalent to work done by Q in 8 days.
So the ratio of their efficiencies will be 8 : 3.
If P does 8 units of work in one day then
Q does 3 units of work in one day.

So, total work will be $8 \times 6 + 3 \times 8 = 72$, then twice the amount of work i.e. 144 will be done by P and Q together in $\frac{144}{(8+3)}$

days $= 13\frac{1}{11}$ days.

FeedBack

Q.95

The ratio of the sum of first a odd natural numbers to the sum of first b even natural numbers is 32 : 51. If a and b are in ratio 4 : 5, then find the sum of all b even numbers and all a odd number.

1 **1600**

2 **2550**

3 **4150**

4 **3320**

Solution:

Correct Answer : 3

Let 'a' and 'b' be 4n and 5n
Sum of odd numbers = $(4n)^2$
and sum of even number = $5n(5n + 1)$

$$\therefore \frac{16n^2}{5n(5n+1)} = \frac{32}{51} \Rightarrow 51(16n^2) = 32(25n^2 + 5n)$$

On solving, we get n = 10
∴ Required sum = $(40)^2 + 50(51) = 4150$.

FeedBack

Bookmark

Answer key/Solution

Q.96

Had a person traveled 3 kmph faster he would have taken 2 hours less to cover a certain distance. Had he traveled 4 kmph slower he would have taken 5 hours more to cover the same distance. Find the distance (in km) he needs to cover.

Solution:

Correct Answer : 120

Let the distance = d (km), speed = s (km/h) and time = t (hours)
then d = st ... (1)
d = (s + 3) (t – 2) ... (2)
d = (s – 4) (t + 5) ... (3)
By (1) and (2), we get
3t – 2s = 6
and by (1) and (3), we get
5s – 4t = 20
Solve the equations to get, s = 12 km/h, t = 10 hours and d = 120 km

FeedBack

Bookmark

Answer key/Solution

Q.97

If $P = 2^7 \times 3^5 \times 7^4 \times 11^7$ and $Q = 2^8 \times 3^6 \times 7^3 \times 5^7$, then find the number of even factors common to both P and Q which are also perfect squares.

1 **24**

2 **192**

3 **168**

4 **18**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

$P = 2^7 \times 3^5 \times 7^4 \times 11^7$
$Q = 2^8 \times 3^6 \times 7^3 \times 5^7$

$2^2 \quad 3^0 \quad 7^0$
$2^4 \quad 3^2 \quad 7^2$
$2^6 \quad 3^4$

Number of common even factors, which are perfect squares → $3 \times 3 \times 2 = 18$

FeedBack

Q.98

A shopkeeper manufactures a product. 35% of the cost of the product is due to the raw material used by him, and 40% of the cost is its manufacturing cost. Remaining costs are due to packaging, transportations, etc. He marked up the price by 25% while selling it in market. If the cost of raw material is decreased by 10% and that of the manufacturing increased by 5%, but other costs as well as the selling price remains the same, then what is the (approximate) profit earned by the shopkeeper?

1 **25%**

2 **27%**

3 **20%**

4 **35%**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Let the cost price of the product = Rs. 100

Then, cost of the product due to raw material = $100 \times \frac{35}{100}$ = Rs. 35 and,

Manufacturing cost = $100 \times \frac{40}{100} = 40$

Marked price = $100\left[1+\frac{25}{100}\right]$ = Rs. 125 = Selling price

New cost price where in cost of the product due to raw material = $35\left[1+\frac{10}{100}\right] = 31.5$

& Manufacturing cost = $40\left[1+\frac{5}{100}\right] = 42$

$\therefore$ New cost price = 31.5 + 42 + 25 = 98.5

$\therefore$ Profit % = $\frac{125-98.5}{98.5} \times 100 \approx 27\%$

FeedBack

Q.99

If both 11^2 and 3^3 are factors of $(a \times 4^3 \times 6^2 \times 13^{11})$, then what is the smallest possible value of a?

1 **121**

2 **363**

3 **3267**

4 **33**

Solution:

Correct Answer : 2

$a \times 4^3 \times 6^2 \times 13'' = a \times 2^8 \times 3^2 \times 13^{11}$

11^2 and 3^3 is factors of given number, but 3^2 is already present in the number.

$\therefore$ a should be at least $11^2 \times 3 = 363$.

FeedBack

Bookmark

Answer key/Solution

Q.100

Find the sum of n terms of the following series:

$$\log\left(\frac{a}{b}\right) + \log\left(\frac{a^2}{b}\right) + \log\left(\frac{a^3}{b}\right) + \ldots$$

1 $\log\left(\frac{a^{\frac{n(n+1)}{2}}}{b}\right)$

2 $n \cdot \log\left(\frac{\sqrt{a}^{n+1}}{b}\right)$

3 $\log\left(\frac{a^{n(n+1)}}{b}\right)$

4 $n \cdot \log\left(\frac{\sqrt{a}}{b}\right)$

Solution:

Correct Answer : 2

n terms of the series

$$\log\left(\frac{a}{b}\right)+\log\left(\frac{a^2}{b}\right)+\log\left(\frac{a^3}{b}\right)+\ldots\log\left(\frac{a^n}{b}\right)$$

$$=(\log a-\log b)+\left(\log a^2-\log b\right)+\ldots+\left(\log a^n-\log b\right)$$

$$=\left(\log a+\log a^2+\ldots+\log a^n\right)-\underbrace{(\log b+\log b+\ldots+\log b)}_{\text{n times}}$$

$$=[1+2+\ldots+n]\log a-n\log b$$

$$=\frac{n(n+1)}{2}\log a-n\log b$$

$$=n\left[\log a^{\frac{n+1}{2}}-\log b\right]$$

$$=n\log\left(\frac{\sqrt{a}^{n+1}}{b}\right)$$

FeedBack

Bookmark

Answer key/Solution