



Mock CAT – 17 2019

Scorecard (procreview.jsp?sid=aaaacfmeUdDwo8biKQs_wSat Jan 11 22:57:36 IST 2020&qsetId=95cqrwcyc7Y=&qsetName=Mock CAT – 17 2019)

Accuracy (AccSelectGraph.jsp?sid=aaaacfmeUdDwo8biKQs_wSat Jan 11 22:57:36 IST 2020&qsetId=95cqrwcyc7Y=&qsetName=Mock CAT – 17 2019)

Qs Analysis (QsAnalysis.jsp?sid=aaaacfmeUdDwo8biKQs_wSat Jan 11 22:57:36 IST 2020&qsetId=95cqrwcyc7Y=&qsetName=Mock CAT – 17 2019)

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VARC

DILR

QA

Sec 1

Direction for questions (1-5): Read the given passage and answer the questions that follow.

Australia's indigenous Aboriginal people have the oldest living culture on Earth. For around 60,000 years, their intricate understanding of ecology ensured survival, and their physical, spiritual, mental and emotional well-being was achieved by maintaining healthy, balanced

relationships with all living and non-living things.

At the heart of their communities were traditional healers. They have been respected and entrusted with the well-being of Aboriginal communities for as long as the culture has been alive, yet still today surprisingly little is known of them. The few healers who remain have extensive knowledge of Aboriginal culture and are believed to possess supernatural abilities. Their role is to treat physical, mental and spiritual ailments using bush medicine, smoking ceremonies and spirit realignment – the latter being a common remedy for depression, or what indigenous Australians call “sickness of the spirit”.

In 2017, the World Health Organization published a study stating the total number of people living with depression in 2015 was estimated to exceed 300 million – an increase of more than 18.4% since 2005.

More recently, the Australian Medical Association announced their agreement with other leading global health organisations, declaring climate change a “health emergency” that will cause a higher incidence of mental ill-health, among other health-related issues. With modern living an apparent threat to both mental well-being and the planet, it can be wondered whether answers could be found by looking back to the wisdom of the world’s oldest continuous civilisation.

An Aboriginal elder and *mubarrn*, meaning “medicine” or “lore” man in the local Noongar language believe their healing ability has been passed down through ancestral lineage. For the Aboriginal healers, the most important first step in relation to healing is the ability to reconnect to the land, since for indigenous Australians, connection to country represents connection to their culture. For this reason, the healing ceremony started the previous day in the Stirling Range National Park, a 90-minute drive north of Kwoorabup, to experience a reconnection ceremony at an ancient sacred site on the traditional lands of the Koreng tribe to which the healer belongs.

Wading through knee-high grass, the healer how to dig for bloodroot (good for numbing toothache) and gather resin formed from the oozing red antiseptic sap of a marri tree, which strangely resembled the very thing it is known for healing – an open wound. “It cures stomach ache too,” he said.

Entering Wickelenup, the healer used clapsticks and what he called a “protection song” to summon his ancestors for the protection and blessing of our steps upon the Earth. After crossing a bed of clay that looked as if giant tins of red and yellow paint had been dropped from the sky, he led the patient to an oddly shaped chunk of volcanic rock that he used as a platform for grinding ochre. Then he stood with his eyes closed and sang the song line belonging to his family, the Kaarl Poorlanger, meaning “people of fire”, before mixing ochre on the stone and painting a russet-coloured pigment onto my skin in a technique known as “smudging”. “This is your mark, your connection to this land. You might wash it off later but I know it’s there... and so will you,” he said.

Q.1

Why is it important for the Aboriginal healers to reconnect to their land?

- 1 Because it has been passed down to them through their ancestral lineages.
- 2 Because it is easier to perform the healing ceremonies in a known place.
- 3 Because the land where they perform their rituals are sacred.
- 4 Because the land is synonymous with their cultural identity.

Solution:

Correct Answer : 4

Genre: Psychology / Cultural Studies

Word Count# 532

 **Bookmark**

 **Answer key/Solution**

Refer to the line: "For the Aboriginal healers, the most important first step in relation to healing is the ability to reconnect to the land, since for indigenous Australians, connection to country represents connection to their culture." So, option 4 is the clear answer.

The other options are mentioned in the passage, but they don't answer the given question.

 **FeedBack**

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Q.2

Why does the author give the statistics related to mental illness and depression in the passage?

- 1 In order to emphasize upon the severity of the issue.
 - 2 To show how the issue is related to the focal point of the passage.
 - 3 In order to highlight a possible preventive measure to counter epidemics.
 - 4 To explain that the traditional healers have the ability to replace modern medical professionals.
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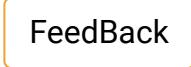
Solution:**Correct Answer : 2****Genre: Psychology / Cultural Studies****Word Count# 532** **Bookmark** **Answer key/Solution**

This question can be answered by the method of elimination. The author mentions depression and mental illness in order to explain that this issue can be curbed by following these traditional healers.

Option 1 – This is incomplete. The main focus is not on this issue itself. The author goes on to correlate this issue to the main idea of the passage. Hence, option 2 is the answer.

Option 3 – The issue is not prevention of epidemics in general. It is too generic.

Option 4 – This is factually not supported by the passage.

 **FeedBack**

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Q.3

Which of the following best describes the healing ceremony mentioned in the passage?

- 1 It comprised a few traditional rituals in order to invoke a connection with the land.
- 2 The ceremony combined modern techniques of marking with traditional beliefs regarding connectivity.
- 3 It entailed detailed ritualistic cleansings and markings.
- 4 The ceremony was a result of a detailed analysis of the sacred land.

Solution:

Correct Answer : 1

Genre: Psychology / Cultural Studies

Word Count# 532

 **Bookmark**

 **Answer key/Solution**

Option 4 is partly true.

**Options 2 and 3 are distorted. There are no ritualistic cleansings and markings.
There is no modern technique described in the passage.**

So, option 1 is the correct answer.

FeedBack

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Q.4

All of the following have been cited in the passage as features of the Australian aboriginal people EXCEPT:

- 1 They have a special relationship with their ecology.
- 2 They have a documented history that goes back 60, 000 years.
- 3 Their healing techniques continue to depend on traditional methods.
- 4 They strive to find a balance with their surroundings.

Solution:

Correct Answer : 2

Genre: Psychology / Cultural Studies

Word Count# 532

 **Bookmark**

 **Answer key/Solution**

Refer to the first paragraph. Options 1 and 4 are clearly mentioned.

Option 3 is the main idea of the passage.

Option 2 – There is no mention of any documented history. This history can be oral or narrative too. So, this is the correct answer as it has not been cited in the passage.

FeedBack

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Q.5

The writer of this passage is most likely a/an:

-
- 1 amateur investigator.
 - 2 social worker.
 - 3 research scholar.
 - 4 conservative teacher.
-

Solution:**Correct Answer : 3****Genre: Psychology / Cultural Studies****Word Count# 532****Bookmark****Answer key/Solution**

The language of the passage is very simple. It also shows that the writer is interested in knowing more about these traditional healers. So, option 3 is a valid choice.

Option 1 – This is not an investigative report.

Option 2 – A social worker is not likely to write such a descriptive narration.

Option 4 – This is a vague category. Conservative means orthodox. ‘Conservative teacher’ may talk about a personality type, but it surely doesn’t refer to any profession.

FeedBack

Direction for questions (6-10): Read the given passage and answer the questions that follow.

At the end of the Gulf war the then US president, George Bush Sr, called on the people of Iraq to rise up against the battered Baghdad regime. The rebellions were swift - with both the Shi'ite Muslims and the Kurds in revolt - but short, as the west failed to support either people.

By the terms of Iraq's surrender it was allowed to keep its helicopter gunships, which were ruthlessly used to regain control. The Kurds fled north to the mountains, to an area known as Iraqi Kurdistan, where they are believed to have lived for over 4,000 years. Estimated to be 20m to 25m strong, they are the fourth-largest ethnic group in the Middle East. They are also the most numerous stateless people in the world, spread over regions of Syria, Turkey, Iran and Iraq. In one of their own sayings, they have "no friends but the mountains". Their recent history is one of suppression. At the end of the first world war, the US president, Woodrow Wilson, supported Kurdish self-determination but no state was drawn into the post-war maps despite it being a clause of the 1920 Treaty of Sèvres. By 1924 Turkey had banned Kurdish culture, language and place names, and in 1929 the short life of an autonomous Kurdish province in Soviet Azerbaijan ended.

In Iraq the situation was a little better. A British protectorate allowed partial cultural freedom, a tradition continued by Arab nationalist and Ba'athist regimes that followed the overthrow of the monarchy in 1958. But there was killing too, and an intermittent war between the Iraqi government and Kurdish Democratic party of Iraq lasted 11 years from 1964 to 1975.

In that year a Kurdish leader, Mustafa Barzani, wrote to the US secretary of state, Henry Kissinger, to ask for help as "our movement and people are being destroyed in an unbelievable way".

But Iraq had reached an agreement with the Shah of Iran, one of the US's most valuable allies

in the region. Mr Kissinger no longer felt a compulsion to help and the Kurdish revolt collapsed.

Murderous persecution followed, culminating in perhaps one of Saddam Hussein's most notorious acts: the killing of more than 5,000 Kurds by mustard gas at Halabja in 1988.

The northern no-fly zone, policed by the US and UK to protect its own sorties into Iraq from 1992, has, however, provided the Kurds with an unprecedented - and unintended - level of protection.

Iraq withdrew its administration from the Kurdish region in 1992 and an autonomous government was formed from the two main political parties. Laurie Mylroie, a journalist for the Atlantic Monthly, travelled to northern Iraq soon after and reported that the Kurds were running their own affairs with a great deal of success.

"With little outside assistance," he wrote, "the Kurds have accomplished what George Bush [Sr] has so far failed to achieve elsewhere in Iraq - the orderly overthrow of Saddam Hussein's regime."

In Sulaimaniya, the largest city under Kurdish control, there were high levels of communal solidarity as its citizens cooperated with authorities that they had previously rebelled against as instruments of the hated Baghdad regime.

But two years later the government had collapsed and the two parties began an armed conflict. A ceasefire was announced in 1998 and the region was divided into two.

The Iraqi Kurds now enjoy numerous civil liberties, including both democracy and a free press. Leaders of ethnic minorities in the region, such as Assyrians and Turkomans, say they are living in a golden age. But autonomous Kurdistan, one of the most enduring legacies of the Gulf war, is vulnerable.

Q.6

As per the passage, at the end of the first world war:

-
- 1 the Treaty of Sèvres was completely violated.**
 - 2 the Kurds were persecuted in Turkey but protected elsewhere.**
 - 3 Iraq reached an agreement with Iran to end the Kurdish revolt.**
 - 4 the Kurds remained without a home state.**
-

Solution:**Correct Answer : 4****Genre: History****Word Count# 603** **Bookmark** **Answer key/Solution**

As this is a fact based question, we need to eliminate options.

Option 1 – We can't say that the violation of one clause of the treaty is a violation of the entire treaty.

Option 2 – It is mentioned that the Kurds were persecuted in other places too.

Option 3 – This didn't happen at the end of the first world war.

Option 4 – It is the correct answer. Refer to the line: "At the end of the first world war, the US president, Woodrow Wilson, supported Kurdish self-determination but no state was drawn into the post-war maps despite it being a clause of the 1920 Treaty of Sèvres."

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Q.7

All of the following can be inferred about the author's views of the West's attitude towards the Kurds EXCEPT:

1 S/he is disgusted by the complete lack of efforts made by the US to protect ethnic minorities in the Middle East.

2 S/he is puzzled by the continuous struggle of this community.

3 S/he is critical of the lack of concrete effort made by them.

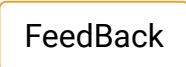
4 S/he is intrigued by the complexity of the issue and the lack of resolve shown by the parties involved.

Solution:**Correct Answer : 3****Genre: History****Word Count# 603** **Bookmark** **Answer key/Solution**

Option 1 is too harsh as 'disgusted' is too extreme a term.

Options 2 and 4 are wrong. The author is neither amused nor intrigued. Option 4 also doesn't talk about the West.

So, option 3 is the correct answer.

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The Iraqi Kurds now enjoy numerous civil liberties, including both democracy and a free press. Leaders of ethnic minorities in the region, such as Assyrians and Turkomans, say they are living in a golden age. But autonomous Kurdistan, one of the most enduring legacies of the Gulf war, is vulnerable.

Q.8

Which of the following is not true about the struggle of the Kurds?

-
- 1 Their situation worsened as a result of an 11 year political war.**
 - 2 They enjoyed protection at a level for the first time in 1967.**
 - 3 They enjoyed a brief reprieve due to a ceasefire in 1998.**
 - 4 Their struggle continues to be real and serious.**
-

Solution:**Correct Answer : 2****Genre: History****Word Count# 603****Bookmark****Answer key/Solution**

Option 1 – It is true. Refer to the line: “But there was killing too, and an intermittent war between the Iraqi government and Kurdish Democratic party of Iraq lasted 11 years from 1964 to 1975.”

Option 3 – It is true. Refer to the line: “A ceasefire was announced in 1998 and the region was divided into two.”

Option 4 – This is the main idea of the passage. So, this is surely true.

Option 2 – It is the correct answer. Refer to the line: “The northern no-fly zone, policed by the US and UK to protect its own sorties into Iraq from 1992, has, however, provided the Kurds with an unprecedented - and unintended - level of protection.” So, the year should be 1992, not 1967.

FeedBack

Direction for questions (6-10): Read the given passage and answer the questions that follow.

At the end of the Gulf war the then US president, George Bush Sr, called on the people of Iraq to rise up against the battered Baghdad regime. The rebellions were swift - with both the Shi'ite Muslims and the Kurds in revolt - but short, as the west failed to support either people.

By the terms of Iraq's surrender it was allowed to keep its helicopter gunships, which were ruthlessly used to regain control. The Kurds fled north to the mountains, to an area known as Iraqi Kurdistan, where they are believed to have lived for over 4,000 years. Estimated to be 20m to 25m strong, they are the fourth-largest ethnic group in the Middle East. They are also the most numerous stateless people in the world, spread over regions of Syria, Turkey, Iran and Iraq. In one of their own sayings, they have "no friends but the mountains". Their recent history is one of suppression. At the end of the first world war, the US president, Woodrow Wilson, supported Kurdish self-determination but no state was drawn into the post-war maps despite it being a clause of the 1920 Treaty of Sévres. By 1924 Turkey had banned Kurdish culture, language and place names, and in 1929 the short life of an autonomous Kurdish province in Soviet Azerbaijan ended.

In Iraq the situation was a little better. A British protectorate allowed partial cultural freedom, a tradition continued by Arab nationalist and Ba'athist regimes that followed the overthrow of the monarchy in 1958. But there was killing too, and an intermittent war between the Iraqi government and Kurdish Democratic party of Iraq lasted 11 years from 1964 to 1975.

In that year a Kurdish leader, Mustafa Barzani, wrote to the US secretary of state, Henry

Kissinger, to ask for help as "our movement and people are being destroyed in an unbelievable way".

But Iraq had reached an agreement with the Shah of Iran, one of the US's most valuable allies in the region. Mr Kissinger no longer felt a compulsion to help and the Kurdish revolt collapsed.

Murderous persecution followed, culminating in perhaps one of Saddam Hussein's most notorious acts: the killing of more than 5,000 Kurds by mustard gas at Halabja in 1988.

The northern no-fly zone, policed by the US and UK to protect its own sorties into Iraq from 1992, has, however, provided the Kurds with an unprecedented - and unintended - level of protection.

Iraq withdrew its administration from the Kurdish region in 1992 and an autonomous government was formed from the two main political parties. Laurie Mylroie, a journalist for the Atlantic Monthly, travelled to northern Iraq soon after and reported that the Kurds were running their own affairs with a great deal of success.

"With little outside assistance," he wrote, "the Kurds have accomplished what George Bush [Sr] has so far failed to achieve elsewhere in Iraq - the orderly overthrow of Saddam Hussein's regime."

In Sulaimaniya, the largest city under Kurdish control, there were high levels of communal solidarity as its citizens cooperated with authorities that they had previously rebelled against as instruments of the hated Baghdad regime.

But two years later the government had collapsed and the two parties began an armed conflict. A ceasefire was announced in 1998 and the region was divided into two.

The Iraqi Kurds now enjoy numerous civil liberties, including both democracy and a free press. Leaders of ethnic minorities in the region, such as Assyrians and Turkomans, say they are living in a golden age. But autonomous Kurdistan, one of the most enduring legacies of the Gulf war, is vulnerable.

Q.9

In the context of the passage, what is the significance of the saying 'no friends but the mountains'?

-
- 1 It exaggerates the extent of the Kurdish homelessness.**
 - 2 It downplays the significance by localizing the struggle.**
 - 3 It adds credence to the continuous nature of the issue.**
 - 4 It highlights a local version of a global story.**
-

Solution:**Correct Answer : 3****Genre: History****Word Count# 603** **Bookmark** **Answer key/Solution**

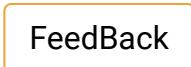
The saying just shows how the struggle continues to be a matter of concern for the Kurds. It also highlights their stateless status.

Option 1 – 'Exaggerates' distorts the tone of the passage.

Option 2 – 'Downplays' doesn't reflect the tone of the author.

Option 3 – It is the correct answer.

Option 4 – It's not a version of any story. It's an attempt to show the nature of the struggle.
So, option 3 is the correct answer.

 **FeedBack**

Direction for questions (6-10): Read the given passage and answer the questions that follow.

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Q.10

Which of the following has been cited as the main area of struggle for the Kurds as per the passage?

-
- 1 Their inability to garner local and international support.
 - 2 Their inability to maintain a stronghold over their homeland.
 - 3 Their unsuccessful attempts to gain political and military support.
 - 4 Their unsuccessful attempts to get their own country.
-

Solution:**Correct Answer : 4****Genre: History****Word Count# 603****Bookmark****Answer key/Solution**

Option 1 – This is partly true. The author doesn't blame the Kurds for the attitude of the international forum.

Option 2 – They don't have a homeland, as per the author.

Option 3 – This is clearly not the main problem (refer to the explanation for option 1).

Option 4 – This is the main idea of the passage.

FeedBack

Direction for questions (11-15): Read the given passage and answer the questions that follow.

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That is, until a financial crisis, the spectacle of crumbling glaciers and scenes of an Arab

Spring gone horribly awry ended the triumphalist bender. Suddenly, the euphoric style gave way to a chorus of dysphoria. [...]

It's important to recognise one of the catastrophist's rhetorical moves. Stories of doom thrive on turning a tension into an incompatibility. A tension implies two forces at odds – like hot and cold, like price stability and jobs, like helping strangers and assisting neighbours; while they pull in different directions, they can be mixed. Earlier big narratives used to explain choices in terms of tension and unstable compromise. In the 1950s and '60s, debates focused on how much the developing world could advance while being part of a wider global economy. A decade later, the tension was how to co-manage a troubled global commons.

Nowadays, the chorus of catastrophe presents differences as intractable and incompatible, the choice between them zero-sum. It's globalism or 'nation first', jobs or climate, friend or foe. The model is simple: earlier leaders muddled, dithered, compromised and mixed. In their efforts to avoid hard decisions, they led the nation to the edge of disaster.

Pessimism helped exorcise post-1989 triumphalism; there are worries about structural features of inequality and how the makers of catastrophe became its beneficiaries. But we also need to see how the consensus of catastrophe that straddles the ideological spectrum – but grows more dire and menacing as one approaches the extremes – favours the politics of the strong man glaring down the nation-doubters.

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Q.11

The main idea of the passage is to:

- 1 highlight the perils of economic crisis and inequality.
- 2 analyze the changing narratives related to economic trends.
- 3 explain how the current narrative of pessimism has been affecting the future of globalization.
- 4 describe a historical anecdote to the current economic trend and the stories around it.

Solution:**Correct Answer : 2****Genre: Economics / Government Policies****Word Count# 570****Bookmark****Answer key/Solution**

In the passage, the author highlights some aspects of the current global narrative on economics. Then the author contrasts the current narrative of pessimism with the earlier types (such as the overtly optimistic flat lined stories). So, option 2 is the clear answer.

Option 1 – This is too narrow. The focus is on the narrative surrounding these issues, not the issues themselves.

Option 3 – This is a conclusion based on the passage. The author is also not focused on the future of globalization.

Option 4 – There is no anecdote. So, this option is distorted.

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Q.12

As per the passage, the flat-world narration was stopped by:

- 1 the Arab Spring uprising.**
- 2 the scenes of environmental catastrophes.**
- 3 the multitude of crisis.**
- 4 the multitude of financial crises.**

Solution:**Correct Answer : 3****Genre: Economics / Government Policies****Word Count# 570****Bookmark****Answer key/Solution**

Refer to the lines: "That is, until a financial crisis, the spectacle of crumbling glaciers and scenes of an Arab Spring gone horribly awry ended the triumphalist bender. Suddenly, the euphoric style gave way to a chorus of dysphoria."

Options 1 and 2 are partly correct.

Option 4 is the effect itself, it's not the reason.

Option 3 is the correct answer as it summarizes these lines accurately.

FeedBack

Direction for questions (11-15): Read the given passage and answer the questions that follow.

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Q.13

Which of the following best describes the theme of the economic narratives from 1950s to now?

- 1 How to encourage inclusive growth, how to manage globalization, how the differences are irreconcilable.
- 2 How pessimism affects developing nations, how globalization is to be resurrected, how national economies are managed.
- 3 How to manage globalization, how the differences are unmanageable, how the future is hopeless.
- 4 How we are overtly optimistic, how we are overtly pessimistic, how we reconcile our differences.

Solution:**Correct Answer : 1****Genre: Economics / Government Policies****Word Count# 570****Bookmark****Answer key/Solution**

Refer to the lines: "In the 1950s and '60s, debates focused on how much the developing world could advance while being part of a wider global economy. A decade later, the tension was how to co-manage a troubled global commons. Nowadays, the chorus of catastrophe presents differences as intractable and incompatible, the choice between them zero-sum."

So, the correct order will be – inclusive growth, managing globalization, overtly pessimistic focus on differences. Hence, option 1 presents the correct order. The other options are factually incorrect.

[FeedBack](#)

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Q.14

As per the passage, nativists are people who:

- 1 are supporters of globalization.
- 2 are opposed to globalization.
- 3 are opposed to national economic interests.
- 4 are supporters of an open economy.

Solution:

Correct Answer : 2

Genre: Economics / Government Policies

Word Count# 570

 **Bookmark**

 **Answer key/Solution**

Refer to the lines: "It's a playbook for nativists, who see interdependence as a recipe for catastrophe." So, these people are against globalization. They would not support open economic trends. So, option 2 is the answer.

FeedBack

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Q.15

In the passage, the author advocates a narrative which:

- 1 projects the future of the world in a positive manner.
- 2 shows that our current economic policy won't survive for long.
- 3 projects a picture of the world economy in a clear light.
- 4 shows a balanced approach towards our economic realities.

Solution:

Correct Answer : 4

Genre: Economics / Government Policies

Word Count# 570

 **Bookmark**

 **Answer key/Solution**

The answer can be found in the last two paragraphs. The author makes two points: s/he is against the current tone of doomsday like prediction regarding the future of the world economy; s/he also doesn't want us to go back to the overtly optimistic fairy-tale based approach towards the future of world economy. So, the author supports a balance between the two approaches. Thus, option 4 is the correct answer. Options 1 and 2 are directly opposite to what the author states. Option 3 is vague as it doesn't clarify what 'clear light' stands for.

FeedBack

Direction for questions (16-20): Read the given passage and answer the questions that follow.

A project to produce detailed maps of all the land on Earth through laser scanning has been revealed by researchers who say action is needed now to preserve a record of the world's cultural, environmental and geological treasures.

Prof Chris Fisher, an archaeologist from Colorado State University, said he founded the Earth Archive as a response to the climate crisis. He said:

"We are going to lose a significant amount of both cultural patrimony –archaeological sites and landscapes – but also ecological patrimony – plants and animals, entire landscapes,

geology, hydrology. We really have a limit time to record those things before the Earth fundamentally changes."

He also said that while it was important to take action on the climate crisis, even if we started "living like the Flintstones", changes are already taking place.

The main technology Fisher hopes to use is aircraft-based Lidar, a scanning technique in which laser pulses are directed at the Earth's surface from an instrument attached to an aircraft. The time it takes for the pulses to bounce back is measured, allowing researchers to work out the distance to the object or surface they strike. Combined with location data, the approach allows scientists to build 3D maps of an area.

The method has already helped reveal ancient cities deep in jungles and map the full extent of sites built by rivals to the Aztecs.

The resolution of aircraft-based Lidar data can lead to images with stunning detail. "We can see things on the ground that are on the order of 20cm or so ... which is about the size of a construction brick," said Fisher. [...]

Fisher said that Lidar works well over land and the ice caps. As a result the project will focus on the planet's land area: roughly 29% of the Earth's surface. Fisher says the first areas to be recorded will be those most under threat, such as coastal regions at risk from sea level rises and the Amazon, where deforestation is surging under the Bolsonaro government in Brazil.

Fisher said the first move was to collate existing Lidar data. The Earth Archive will also contain data from other techniques including aerial photography and satellite data, some of which already exists.

The result, Fisher said, will be an open source record of the planet which could help archaeologists, geologists, conservationists and others.

Besides revealing manmade structures within jungles, Lidar can also reveal details such as the age and complexity of forests. The data can also be used to reconstruct landscapes and to track changes to the landscape over decades.

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Fisher's plans have had a mixed response from others in the field. While most say such a resource would be valuable, they say the practical hurdles are considerable.

Q.16

As per the passage, what is the main utility of Lidar?

- 1 The directing of pulses towards the Earth's surface from the aircraft.
- 2 Scientists being able to calculate the data given by Lidar.
- 3 The facilitation of creation of accurate 3D maps.
- 4 The measuring of the pulses that bounce back.

Solution:

Correct Answer : 3

Genre: Geography / Geology

Word Count# 525

 **Bookmark**

 **Answer key/Solution**

Refer to the lines: "The main technology Fisher hopes to use is aircraft-based Lidar, a scanning technique in which laser pulses are directed at the Earth's surface from an instrument attached to an aircraft. The time it takes for the pulses to bounce back is measured, allowing researchers to work out the distance to the object or surface they strike. Combined with location data, the approach allows scientists to build 3D maps of an area." So, the last sentence shows the main utility of the technique. Hence, option 3 is the correct answer.

Options 1 and 4 talk about how the technique works, not its utility.

Option 2 is vague and narrow. Option 3 is a clearer choice.

 **FeedBack**

Direction for questions (16-20): Read the given passage and answer the questions that follow.

A project to produce detailed maps of all the land on Earth through laser scanning has been revealed by researchers who say action is needed now to preserve a record of the world's cultural, environmental and geological treasures.

Prof Chris Fisher, an archaeologist from Colorado State University, said he founded the Earth Archive as a response to the climate crisis. He said:

"We are going to lose a significant amount of both cultural patrimony –archaeological sites and landscapes – but also ecological patrimony – plants and animals, entire landscapes, geology, hydrology. We really have a limit time to record those things before the Earth fundamentally changes."

He also said that while it was important to take action on the climate crisis, even if we started "living like the Flintstones", changes are already taking place.

The main technology Fisher hopes to use is aircraft-based Lidar, a scanning technique in

which laser pulses are directed at the Earth's surface from an instrument attached to an aircraft. The time it takes for the pulses to bounce back is measured, allowing researchers to work out the distance to the object or surface they strike. Combined with location data, the approach allows scientists to build 3D maps of an area.

The method has already helped reveal ancient cities deep in jungles and map the full extent of sites built by rivals to the Aztecs.

The resolution of aircraft-based Lidar data can lead to images with stunning detail. "We can see things on the ground that are on the order of 20cm or so ... which is about the size of a construction brick," said Fisher. [...]

Fisher said that Lidar works well over land and the ice caps. As a result the project will focus on the planet's land area: roughly 29% of the Earth's surface. Fisher says the first areas to be recorded will be those most under threat, such as coastal regions at risk from sea level rises and the Amazon, where deforestation is surging under the Bolsonaro government in Brazil.

Fisher said the first move was to collate existing Lidar data. The Earth Archive will also contain data from other techniques including aerial photography and satellite data, some of which already exists.

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He says a large part of the cost lies in getting the equipment to the required location, while filtering the data takes people power. While Fisher said the team was seeking funding, he said some organisations had already pledged to donate services in kind.

Fisher's plans have had a mixed response from others in the field. While most say such a resource would be valuable, they say the practical hurdles are considerable.

Q.17

Which of the following has been cited as an achievement of Lidar scanning?

- 1 The study of the Amazonian forests
 - 2 The work on ancient civilizations
 - 3 The mapping of 29% of the Earth's surface
 - 4 The uncovering of buried cities and sites
-

Solution:**Correct Answer : 4****Genre: Geography / Geology****Word Count# 525****Bookmark****Answer key/Solution**

Refer to the line: "The method has already helped reveal ancient cities deep in jungles and map the full extent of sites built by rivals to the Aztecs." Option 4 is the clear answer. The other options have not been mentioned as the impact of the technology. Option 3 is the aim of Fisher. It has not already been achieved.

FeedBack

Direction for questions (16-20): Read the given passage and answer the questions that follow.

A project to produce detailed maps of all the land on Earth through laser scanning has been revealed by researchers who say action is needed now to preserve a record of the world's cultural, environmental and geological treasures.

Prof Chris Fisher, an archaeologist from Colorado State University, said he founded the Earth Archive as a response to the climate crisis. He said:

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Fisher's plans have had a mixed response from others in the field. While most say such a resource would be valuable, they say the practical hurdles are considerable.

Q.18

Which of the following most accurately describes the author's views on Fisher's project?

-
- 1 The author is vehemently opposed to the project's extravagance.**
 - 2 The author is cautious in his evaluation of the project's success.**
 - 3 The author is supportive of Fisher's aim, but not of his means.**
 - 4 The author is in favor of the use of new technology.**
-

Solution:**Correct Answer : 2****Genre: Geography / Geology****Word Count# 525** **Bookmark** **Answer key/Solution**

Tagging: RC – Tone Based The author's tone in the passage is neutral. There isn't much data to show whether the author likes or dislikes the project. The last paragraph shows that the author is ready to evaluate the practicality of the project. So, option 2 is the correct answer.

Options 1 and 3 are extreme. The author doesn't criticize Fisher's means: Lidar scanning.

Option 4 is irrelevant. The focus of the passage is not the use of new technology.

FeedBack

Direction for questions (16-20): Read the given passage and answer the questions that follow.

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Fisher's plans have had a mixed response from others in the field. While most say such a resource would be valuable, they say the practical hurdles are considerable.

Q.19

According to Fisher, what is the main aim of the Earth Archive?

-
- 1 To act on the climate crisis by limiting the time of change.
 - 2 To save a record of some of the world's heritage which are under threat due to climate change.
 - 3 To uphold the cultural and ecological patrimony of the world by preserving archaeological sites and landscapes.
 - 4 To produce detailed accounts of the world's land by scanning through laser technology.
-

Solution:**Correct Answer : 2****Genre: Geography / Geology****Word Count# 525** **Bookmark** **Answer key/Solution**

Tagging: RC – Fact and Inference Based Refer to the line: “preserve a record of the world’s cultural, environmental and geological treasures.” ‘A project’ at the beginning of the passage refers to Earth Archive. So, option 2 is the clear answer.

Option 1 – It is a distorted option. Firstly, Fisher admits that we can’t stop change or the climate crisis.

Option 3 – This simply juxtaposes two lines of the passage. Secondly, Earth Archive aims to produce and preserve maps, not the sites.

Option 4 – This is the method, not the objective.

 **FeedBack**

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Fisher's plans have had a mixed response from others in the field. While most say such a resource would be valuable, they say the practical hurdles are considerable.

Q.20

As per the passage, Fisher's critics would agree with all of the following EXCEPT:

- 1 This project would lead to a depletion of the world's cultural resources.
 - 2 The aim of the project is noble.
 - 3 The logistics of the project are a matter of concern.
 - 4 Though the project has some utility, it also entails a few concerns.
-

Solution:**Correct Answer : 1****Genre: Geography / Geology****Word Count# 525** **Bookmark** **Answer key/Solution**

Refer to the last paragraph. "While most say such a resource would be valuable, they say the practical hurdles are considerable." So, these people would agree with options 2, 3, and 4.

Option 1 is too extreme. So, it is the correct answer.

 FeedBack

Direction for questions (21-24): Read the given passage and answer the questions that follow.

[...] It could be that the neighbourhood, not the individual, is the essential unit of social change. If you're trying to improve lives, maybe you have to think about changing many elements of a single neighbourhood, in a systematic way, at a steady pace. [...]

In a classic study, the sociologist Eric Klinenberg showed just how important neighbourhood is in determining who survives in a crisis. Klinenberg compared deaths in two Chicago neighbourhoods during a heat wave in 1995. More than six times as many people died in North Lawndale as in South Lawndale, even though the two places are demographically comparable.

The fact is that human behaviour happens in contagious, networked ways. Suicide, obesity and decreasing social mobility spread as contagions.

When you think in neighbourhood terms rather than in individual terms you see things previously rendered invisible. For example, Klinenberg found that fewer people died in South Lawndale in great part because there was more social connection there. Klinenberg's new book, "Palaces for the People," emphasizes the importance of "social infrastructure," physical places like libraries where people can gather. What do libraries have to do with deaths in a heat wave? It turns out quite a lot. Libraries nurture relationships among people who check in on one another when crises hit.

Some people say that we have to promote both kinds of change, individual and neighbourhood. Of course that's true, but it's also what people say when they don't know how to think in geographic terms and don't know how to adjust their work to neighbourhood realities.

Thinking in neighbourhood terms requires a radical realignment in how you see power structures. Does the neighbourhood control its own networks of care, or are there service providers coming down from above? Do the local norms of interaction need to be changed? For example, do people feel it's normal to knock on a neighbour's door and visit, or would that be considered a dangerous invasion of privacy? Are there forums where the neighbourhood can tell its collective story?

Thinking in neighbourhood terms means radical transformation in how change is done. It means escaping the tyranny of randomized controlled experiments in which one donor funds one program that tries to isolate one leverage point to have "impact."

It means adjusting the structures of the state so that the neighbourhood is an important structure of self-government, rather than imposing blanket programs willy-nilly across neighbourhood lines. [...]

Q.21

Which of the following doesn't reflect power structures in a neighborhood?

- 1 The network of care existing in the neighborhood.
- 2 The number of libraries which can be found in a neighborhood.
- 3 Rules pertaining to the neighborhood interactions.
- 4 Availability of outlets for the neighbors to express themselves.

Solution:

Correct Answer : 2

Genre: Sociology

Word Count# 403

 **Bookmark**

 **Answer key/Solution**

Refer to the paragraph: "Thinking in neighborhood terms requires a radical realignment in how you see power structures. Does the neighborhood control its own networks of care, or are there service providers coming down from above? Do the local norms of interaction need to be changed? For example, do people feel it's normal to knock on a neighbor's door and visit, or would that be considered a dangerous invasion of privacy? Are there forums where the neighborhood can tell its collective story?" So, options 1, 3, and 4 are true.

The example of library is given in a different context. So, the answer is option 2.

 **FeedBack**

Direction for questions (21-24): Read the given passage and answer the questions that follow.

[...] It could be that the neighbourhood, not the individual, is the essential unit of social change. If you're trying to improve lives, maybe you have to think about changing many elements of a single neighbourhood, in a systematic way, at a steady pace. [...]

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It means adjusting the structures of the state so that the neighbourhood is an important structure of self-government, rather than imposing blanket programs willy-nilly across neighbourhood lines. [...]

Q.22

Which of the following is the main point proven by the study by Eric Klinenberg?

- 1 How primary caregivers in families affect the neighborhood structure.
- 2 How collective networked groups affect individuals.
- 3 How individuals exist within the framework of family ties.
- 4 How libraries affect human interactions.

Solution:

Correct Answer : 2

Genre: Sociology

Word Count# 403

 **Bookmark**

 **Answer key/Solution**

Tagging: RC – Fact and Inference Based Refer to the line: “In a classic study, the sociologist Eric Klinenberg showed just how important neighborhood is in determining who survives in a crisis.” So, Klinenberg shows that individuals in a neighborhood don’t exist in isolation. The networks or groups affect them. Hence, option 2 is the best choice.

Options 1 and 3 are irrelevant as ‘families’ or ‘familial ties’ are not part of the discussion.

Option 4 talks about human interactions. This passage is about neighborhoods.

 **FeedBack**

Direction for questions (21-24): Read the given passage and answer the questions that follow.

[...] It could be that the neighbourhood, not the individual, is the essential unit of social change. If you're trying to improve lives, maybe you have to think about changing many elements of a single neighbourhood, in a systematic way, at a steady pace. [...]

In a classic study, the sociologist Eric Klinenberg showed just how important neighbourhood is in determining who survives in a crisis. Klinenberg compared deaths in two Chicago neighbourhoods during a heat wave in 1995. More than six times as many people died in North Lawndale as in South Lawndale, even though the two places are demographically comparable.

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Some people say that we have to promote both kinds of change, individual and neighbourhood. Of course that's true, but it's also what people say when they don't know how to think in geographic terms and don't know how to adjust their work to neighbourhood realities.

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Q.23

The main conclusion of the passage is that:

- 1 if one wants to improve the society, one needs to improve intrapersonal interactions.
- 2 any government policy dealing with social change should account for individualities of neighborhoods.
- 3 sociologists have done a lot of research to understand the dynamics between the individual and his/her surroundings.
- 4 radicalization of the society has to begin with changing the structures of neighborhoods and how they operate.

Solution:

Correct Answer : 2

Genre: Sociology

Word Count# 403

 **Bookmark**

 **Answer key/Solution**

Refer to the last paragraph. The author in this passage focuses on the importance of accounting for the specific natures of different neighborhoods while thinking of social changes. Hence, s/he concludes by saying that a government must not create blanket policies without being concerned about the nuances of a particular neighborhood. Hence, option 2 is the correct answer.

Option 1 – ‘Intrapersonal interactions’ is too narrow a term to talk about the overall conclusion of the passage.

Option 3 – The author doesn’t quote too many sociologists. This also is unrelated to the main idea of the passage.

Option 4 – This actually counters the last paragraph. The author cautions against the creation of blanket policies. Hence, option 2 is the best choice.

FeedBack

Direction for questions (21-24): Read the given passage and answer the questions that follow.

[...] It could be that the neighbourhood, not the individual, is the essential unit of social change. If you're trying to improve lives, maybe you have to think about changing many elements of a single neighbourhood, in a systematic way, at a steady pace. [...]

In a classic study, the sociologist Eric Klinenberg showed just how important neighbourhood is in determining who survives in a crisis. Klinenberg compared deaths in two Chicago neighbourhoods during a heat wave in 1995. More than six times as many people died in North Lawndale as in South Lawndale, even though the two places are demographically comparable.

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Q.24

Why does the author call the neighborhood as the essential unit of social change?

- 1 Because they guard the norms of individual welfare.
- 2 Because they dictate how an individual must behave.
- 3 Because they represent the collective goal.
- 4 Because they reflect the mirror through which values get created.

Solution:

Correct Answer : 3

Genre: Sociology

Word Count# 403

 **Bookmark**

 **Answer key/Solution**

This can be answered by understanding the main idea of the passage: individuals don't exist in vacuum. The neighborhoods affect the ways individuals behave. Hence, they are the real catalysts of social change. However, the author doesn't clarify this point explicitly. Hence, the answer option should not be too extreme. Options 1 and 2 are too extreme. Option 4 is irrelevant. Option 3 is the only option that matches the main idea. Hence, it is the correct answer.

FeedBack

Q.25

Directions for question (25): The four sentences (labelled 1, 2, 3, and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of four numbers as your answer.

1. Of course he had lived to such a great age that his blindness became like an ornament on him.
2. Ezeulu did not like to think that his sight was no longer as good as it used to be.
3. If Ezeulu lived to be so old he too would accept such a loss.
4. And some day he would have to rely on someone else's eyes as his grandfather had done when his sight failed.

Solution:**Correct Answer : 2413**

As this paragraph is in a narrative pattern, the sequence of events or thematic pairs would help find the correct arrangement.

 **Bookmark**
 **Answer key/Solution**

'He had lived' in 1 refers to Ezeulu's grandfather as mentioned in 4. So, 41 is a mandatory pair.

'If Ezeulu lived to be so old...' compares Ezeulu's wish to the longevity of his grandfather. So, 3 has to come after both 4 and 1. 3 can't come in between. Then, the 'he' in 1 would not refer to Ezeulu's grandfather (grammatically). So, 413 is a mandatory sequence. 2 has to be the opening sentence.

Thus, 2413 is the correct sequence.

 **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.

The concept of destiny is not at all synonymous with the concept of 'necessity'. Necessity, as the immanent and causal link joining objective processes in a series of 'if...then' connections, may form the ontological content of destiny, but it does not necessarily do so. In theological and teleological world-views, destiny most often is precisely that which does not spring from necessity. The whim or fancy of a god may become destiny. The accidental may become destiny, and so may an act that springs from 'free will'.

- 1 Destiny and necessity are different conceptual entities without any shared boundary.
- 2 The concepts of destiny and necessity may look similar but they are essentially different world-views.
- 3 Conceptually, necessity and destiny have some commonalities but they are not identical.
- 4 Destiny may give rise to the essence of necessity but not the vice-versa.

Solution:**Correct Answer : 3**

In this paragraph, the main point of the author is the topic sentence which also happens to be the opening sentence.

Everything else in the paragraph is an explanation of that idea.

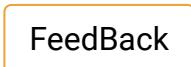
So, option 3 is the clear answer. The author essentially means that destiny and necessity are conceptually different, but they have some similarities.

 **Bookmark**
 **Answer key/Solution**

Option 1 – ‘Any shared boundary’ is factually incorrect. The paragraph hints at some commonalities.

Option 2 – These are not world-views.

Option 4 – This is a totally irrelevant option. The author doesn’t mention anything about the cause of the ‘essence of necessity’.

 **FeedBack**
Q.27

Directions for question (27): 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.

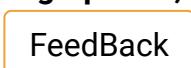
1. Twenty years ago we agreed to meet here tonight.
2. I'll explain if you want to be sure that everything's all right.
3. I will be glad about that, if my old friend comes too.
4. It sounds strange to you, doesn't it?
5. I'm waiting for a friend.

Solution:**Correct Answer : 3**

The correct order is 5142. We don't need to rearrange these sentences, however.

 **Bookmark**
 **Answer key/Solution**

This is a slightly vague paragraph. So, the key is to look for clues related to mandatory pairs. All the sentences talk about someone explaining his meeting with his friend. However, sentence 3 has the phrase ‘glad about that’. That doesn't link with any other sentence in the paragraph. So, sentence 3 is the odd one out.

 **FeedBack**

Q.28

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

1. Both approaches need to be tested further to ensure they work outside the lab.
2. In the second study, a team genetically modified bacteria in the mosquitoes' microbiome to secrete a substance that prevented the growth of the malaria-causing parasite, 'Plasmodium'.
3. One study focused on whether mosquitoes with genetic modifications that make them more resistant to the malaria parasite are able to spread.
4. Two studies affirm the promise of genetic modification of mosquitoes to curb malaria transmission.

Solution:

Correct Answer : 4321

This is a pretty direct question.

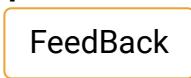
 **Bookmark**

 **Answer key/Solution**

'One study' and 'in the second study' in 3 and 2 respectively make them a mandatory pair.

4 has to be the opening sentence as 'two studies' introduce the theme of the sentences.

1 has to come at the end. It talks about 'both approaches'. This phrase refers to the approaches mentioned in 3 and 2. So, 4321 is the correct sequence.

 **FeedBack**

Q.29

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

1. Then, 500,000 years ago, a period of tectonic activity and variable climate caused a disruption in the archaeological record at the site.
2. Resources were different and more scarce; new, more variable tools showed up: small blades made of obsidian.
3. For hundreds of thousands of years, hominins there were using stone axes that changed very little.
4. When the record resumed, 320,000 years ago, the lifestyles of the hominins there had changed markedly.

Solution:**Correct Answer : 3142**

The strongest clues in the paragraph are the two years mentioned: 500,000 has to come before 320, 000 as the paragraph maintains a linear narrative sequence. So, 14 is a pair.

 **Bookmark** **Answer key/Solution**

3 introduces the topic of the sentence: what was thought about hominis originally.

2 has to come at the end as it explains the 'lifestyles...changes' mentioned in sentence 4. So, 3142 is a correct sequence.

 **FeedBack****Q.30**

Directions for question (30): The passage given below is followed by four summaries. Choose the option that best captures the author's position.

For one to be considered fluent, they must be in a position to speak or perform the language with fluency and accuracy. Some people may understand a second language well though they may face difficulties in speaking the language. Such people cannot therefore be considered proficient in a language. In addition, however much one learns a second language, they might never be in a position to use the language in the same way they use their native language. People also prejudice against a different language. They normally have judgments on a second language. Some believe that they cannot communicate fully. These intuitions normally deter people from learning or using the second language.

- 1 **People try to learn a second language but they are discouraged by a myriad factors.**
- 2 **For someone to be fluent in a second language, factors such as being judgemental or prejudiced may be hurdles.**
- 3 **Lack of fluency, inability to master a native language, and failure to communicate affect the ability of people to learn a language.**
- 4 **Some factors such as lack of fluency, accuracy, and natural prejudice deter people from trying to learn a second language.**

Solution:**Correct Answer : 2****The main points of the paragraph are:**

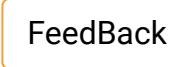
- People can be considered fluent in a second language.
- Some factors affect the ability of people to learn a second language.

 **Bookmark** **Answer key/Solution**

So, option 2 is the correct answer.

Options 1 and 4 are wrong because they talk about factors that discourage people from 'trying to learn a second language'. The paragraph doesn't talk about trying but actually learning a second language.

Option 3 – It talks about language in general, not a second language.

 **FeedBack**

Q.31

Directions for question (31): 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. Both the highland and lowland regions soon saw squash and cassava cultivated by these aspiring people.
 2. During the middle pre-classic period, which lasted until about 300 BC, Mayan farmers began to expand their presence.
 3. This middle period also saw the rise of the first major Mesoamerican civilization, the Olmecs.
 4. In addition to agriculture, the Mayans also displayed more advanced cultural traits like pyramid-building and city construction.
 5. The earliest Mayans were agricultural, growing crops such as corn and beans.
-

Solution:**Correct Answer : 4**

The correct order is 5213. In this paragraph, we need to arrange the four sentences in a paragraph.

Bookmark**Answer key/Solution**

5 opens the paragraph by introducing the agrarian roots of the earliest Mayans.

2 comes next as it talks about expanding the presence. **1** gives an example of that expansionist attitude. **3** comes next as it adds to the trait in the middle period. It goes thematically with **2** and **1**. So, **5213** is the correct sequence of the paragraph.

4 belongs to the topic. But it will thematically come later as the focus of the sentence shifts the topic to 'non-agrarian' fields. So, **4** is the odd one out.

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. Between 1969 and 1972, Apollo astronauts brought back to Earth a total of nine containers of moon material that were sealed on the lunar surface.
2. The triumphs of the Space Age are perhaps the greatest illustrations of this gap.
3. "Seeing is believing" is such a truism that it was already a cliché in the second century BCE.
4. Fewer than a dozen years passed between the founding of NASA and the Apollo 11 Moon landing on July 20, 1969.
5. The saying has stuck with us, because the human imagination is puny compared with the vastness of our experience and our potential.

Solution:**Correct Answer : 1**

The correct order is **3524**.

Bookmark**Answer key/Solution**

Sentence 3 opens the paragraph by talking about a saying.

Sentence 5 continues the idea of 'the saying'. So, **35** is a pair.

Sentence 2 talks about 'this gap' which is a conclusion about the difference mentioned in **5**.

So, the odd sentence can be **1** or **4**. Sentence **1** talks about what the astronauts brought back from the lunar surface. So, it has to come after sentence **4**. There also needs to be a transition sentence between **4** and **1**. So, **1** has to be the odd sentence in this paragraph.

FeedBack

Q.33

Directions for question (33): The passage given below is followed by four summaries. Choose the option that best captures the author's position.

The Shipman story illustrates the two complementary components of statistical literacy. First is the ability to carry out statistical investigations leading to clear communication of what the data reveals. The second vital component is the ability to read about a claim based on data, while also having an idea of how to critique the numbers and a sense of which questions to ask. Statistics often give some answers, but they generally raise even more questions. This kind of statistical literacy is difficult to teach. It cannot be reduced to formulae and algorithms – it is best learned through repeated experience and mentoring, almost as an apprenticeship. It takes time and effort to learn the art of statistics.

- 1 Collecting and analyzing data from statistical investigations is an ability that requires some skill and effort.
- 2 Generally, statisticians understand that their investigations may not answer all questions but they do teach a valuable lesson.
- 3 The two components of statistical literacy focus on the ability to carry out statistical investigations and the ability to analyze claims based on those investigations.
- 4 Learning statistics is not an easy task as illustrated by The Shipman story.

Solution:

Correct Answer : 1

The main point of the author is that statistical investigations are tricky.

 **Bookmark**

 **Answer key/Solution**

Collecting and analyzing those data require a skill. This skill also requires time and effort. So, option 1 is the clear answer.

Option 2 – This is outside the scope of the paragraph.

Option 3 – This is too narrow.

Option 4 – This just juxtaposes two sentences from the paragraph. It misses the main idea of the paragraph.

FeedBack

Q.34

Directions for question (34): The four sentences (labelled 1, 2, 3, and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of four numbers as your answer.

1. They're also raising important questions about what it means to be human.
2. Human enhancement technologies are opening up tremendous new possibilities.
3. These technologies are currently geared towards upgrading or restoring physical and psychological abilities for medical purposes.
4. And what is good or bad for out individual and collective wellbeing.

Solution:

Correct Answer : 2143

Sentences 1, 3, and 4 can't be the opening sentence because of 'they're', 'these', and 'and'.

 **Bookmark**

 **Answer key/Solution**

So, 2 is the opening sentence.

1 and 4 is a pair as 'and' adds to the idea of improving human behaviour.

The only place for sentence 3 is at the end. It expands on the idea of how these technologies are being used in new fields. So, the correct sequence is 2143.

FeedBack

Sec 2

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

At a newly opened lane in a toll plaza, only three types of vehicles are allowed i.e. bus, truck, and car. The charges for each type of vehicle are Rs. 500, Rs. 400 and Rs. 200 respectively. Every vehicle that passed through the toll plaza paid either in the denomination of Rs. 500 or Rs. 100. Vaibhav, the toll plaza executive had no cash at the starting of the toll plaza and at no instance, he had the shortage of the change during the time frame mentioned i.e. if a driver gave him Rs. 500 and wanted Rs. 100 back, at such instances he always had the change.

Vaibhav counted the denomination after every 10 vehicles passed the toll and he did this three times so as not to forget everything due to heavy rush. Further, he observed, that there is at least one vehicle of each type in every batch of 10 vehicles.

1. After the first 10 vehicles, Vaibhav noticed that he had a total of 6 currency notes of Rs. 500 and 2 currency notes of Rs. 100 each.
2. After the next 10 vehicles passed Vaibhav noticed that now he had a total of 13 currency notes of Rs. 500 and 12 currency notes of Rs. 100 each.
3. And, the final time he was able to check the currency he observed that now he had a total of 22 currency notes of Rs. 500 and 7 currency notes of Rs. 100 each.
4. Vaibhav also noticed that the maximum number of vehicle passed in first 30 vehicles were trucks.

The following questions pertain to the first thirty vehicles passed on the newly opened lane of the highway.

Q.35

Find the total number of trucks that passed through the lane.

Solution:**Correct Answer : 12**
 **Bookmark**
 **Answer key/Solution**

From the information we can conclude that the money he collected after 10 vehicles has passed is Rs. 3,200. In next 10 vehicles, he must have collected Rs. 4,500 and in final 10 vehicles the amount collected is Rs. 4,000.

The toll charges for a bus is Rs. 500, for a truck is Rs. 400 and for a car is Rs. 200. Further, there is at least one vehicle of each type. Now, from the information we can conclude that,

For first 10 vehicles,

$$500a + 400b + 200c = 3200$$

and, $a + b + c = 10$, where a, b and c are the number of buses, trucks and cars passed the toll respectively.

Solving the equations, we get $a = 2$, $b = 3$ and $c = 5$.

Similarly, for next 10 vehicles, equations will be

$$500a + 400b + 200c = 4500$$

and $a + b + c = 10$, then $a = 7$, $b = 2$ and $c = 1$ is the only possible solution

for final 10 vehicles,

$$500a + 400b + 200c = 4000$$

and $a + b + c = 10$, then

Three possible combinations of (a, b, c) are their

$$(a, b, c) = (2, 7, 1) \quad \dots (i)$$

$$= (4, 4, 2) \quad \dots (ii)$$

$$\text{or} \quad = (6, 1, 3) \quad \dots (iii)$$

Since the number of trucks were the maximum therefore only first combination i.e., $(a, b, c) = (2, 7, 1)$ is possible.

	500(Bus)	400(Truck)	200(Car)
First 10	2	3	5
11–20	7	2	1
21–30	2	7	1
	<u>11</u>	<u>12</u>	<u>7</u>

The total number of trucks passed through the lane are $3 + 2 + 7 = 12$.

 **FeedBack**

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

At a newly opened lane in a toll plaza, only three types of vehicles are allowed i.e. bus, truck, and car. The charges for each type of vehicle are Rs. 500, Rs. 400 and Rs. 200 respectively. Every vehicle that passed through the toll plaza paid either in the denomination of Rs. 500 or Rs. 100. Vaibhav, the toll plaza executive had no cash at the starting of the toll plaza and at no instance, he had the shortage of the change during the time frame mentioned i.e. if a driver gave him Rs. 500 and wanted Rs. 100 back, at such instances he always had the change.

Vaibhav counted the denomination after every 10 vehicles passed the toll and he did this three times so as not to forget everything due to heavy rush. Further, he observed, that there is at least one vehicle of each type in every batch of 10 vehicles.

1. After the first 10 vehicles, Vaibhav noticed that he had a total of 6 currency notes of Rs. 500 and 2 currency notes of Rs. 100 each.
2. After the next 10 vehicles passed Vaibhav noticed that now he had a total of 13 currency notes of Rs. 500 and 12 currency notes of Rs. 100 each.
3. And, the final time he was able to check the currency he observed that now he had a total of 22 currency notes of Rs. 500 and 7 currency notes of Rs. 100 each.
4. Vaibhav also noticed that the maximum number of vehicle passed in first 30 vehicles were trucks.

The following questions pertain to the first thirty vehicles passed on the newly opened lane of the highway.

Q.36

What is the minimum number of vehicles that need to pass before 6th truck could pass?

Solution:**Correct Answer : 20**
 **Bookmark**
 **Answer key/Solution**

From the information we can conclude that the money he collected after 10 vehicles has passed is Rs. 3,200. In next 10 vehicles, he must have collected Rs. 4,500 and in final 10 vehicles the amount collected is Rs. 4,000.

The toll charges for a bus is Rs. 500, for a truck is Rs. 400 and for a car is Rs. 200. Further, there is at least one vehicle of each type. Now, from the information we can conclude that,

For first 10 vehicles,

$$500a + 400b + 200c = 3200$$

and, $a + b + c = 10$, where a, b and c are the number of buses, trucks and cars passed the toll respectively.

Solving the equations, we get $a = 2$, $b = 3$ and $c = 5$.

Similarly, for next 10 vehicles, equations will be

$$500a + 400b + 200c = 4500$$

and $a + b + c = 10$, then $a = 7$, $b = 2$ and $c = 1$ is the only possible solution

for final 10 vehicles,

$$500a + 400b + 200c = 4000$$

and $a + b + c = 10$, then

Three possible combinations of (a, b, c) are their

$(a, b, c) = (2, 7, 1)$... (i)	
$= (4, 4, 2)$... (ii)	
$\text{or } = (6, 1, 3)$... (iii)	

Since the number of trucks were the maximum therefore only first combination i.e., $(a, b, c) = (2, 7, 1)$ is possible.

	500(Bus)	400(Truck)	200(Car)
First 10	2	3	5
11–20	7	2	1
21–30	2	7	1
	$\frac{11}{11}$	$\frac{12}{12}$	$\frac{7}{7}$

The minimum number of vehicle need to pass before 6th truck could pass are 20 Vehicles.

 **FeedBack**

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

At a newly opened lane in a toll plaza, only three types of vehicles are allowed i.e. bus, truck, and car. The charges for each type of vehicle are Rs. 500, Rs. 400 and Rs. 200 respectively. Every vehicle that passed through the toll plaza paid either in the denomination of Rs. 500 or Rs. 100. Vaibhav, the toll plaza executive had no cash at the starting of the toll plaza and at no instance, he had the shortage of the change during the time frame mentioned i.e. if a driver gave him Rs. 500 and wanted Rs. 100 back, at such instances he always had the change.

Vaibhav counted the denomination after every 10 vehicles passed the toll and he did this three times so as not to forget everything due to heavy rush. Further, he observed, that there is at least one vehicle of each type in every batch of 10 vehicles.

1. After the first 10 vehicles, Vaibhav noticed that he had a total of 6 currency notes of Rs. 500 and 2 currency notes of Rs. 100 each.
2. After the next 10 vehicles passed Vaibhav noticed that now he had a total of 13 currency notes of Rs. 500 and 12 currency notes of Rs. 100 each.
3. And, the final time he was able to check the currency he observed that now he had a total of 22 currency notes of Rs. 500 and 7 currency notes of Rs. 100 each.
4. Vaibhav also noticed that the maximum number of vehicle passed in first 30 vehicles were trucks.

The following questions pertain to the first thirty vehicles passed on the newly opened lane of the highway.

Q.37

What is maximum number of Rs. 100 note Vaibhav can have at any point in time if all bus drivers offered Rs. 500 note only?

Solution:**Correct Answer : 14**
 **Bookmark**
 **Answer key/Solution**

From the information we can conclude that the money he collected after 10 vehicles has passed is Rs. 3,200. In next 10 vehicles, he must have collected Rs. 4,500 and in final 10 vehicles the amount collected is Rs. 4,000.

The toll charges for a bus is Rs. 500, for a truck is Rs. 400 and for a car is Rs. 200. Further, there is at least one vehicle of each type. Now, from the information we can conclude that,

For first 10 vehicles,

$$500a + 400b + 200c = 3200$$

and, $a + b + c = 10$, where a, b and c are the number of buses, trucks and cars passed the toll respectively.

Solving the equations, we get $a = 2$, $b = 3$ and $c = 5$.

Similarly, for next 10 vehicles, equations will be

$$500a + 400b + 200c = 4500$$

and $a + b + c = 10$, then $a = 7$, $b = 2$ and $c = 1$ is the only possible solution

for final 10 vehicles,

$$500a + 400b + 200c = 4000$$

and $a + b + c = 10$, then

Three possible combinations of (a, b, c) are their

$$\begin{array}{ll} (a, b, c) = (2, 7, 1) & \dots (i) \\ = (4, 4, 2) & \dots (ii) \\ \text{or} & \dots (iii) \\ = (6, 1, 3) & \end{array}$$

Since the number of trucks were the maximum therefore only first combination i.e., $(a, b, c) = (2, 7, 1)$ is possible.

	500(Bus)	400(Truck)	200(Car)
First 10	2	3	5
11–20	7	2	1
21–30	2	7	1
	<u>11</u>	<u>12</u>	<u>7</u>

In first 10 vehicles, vaibhav can have maximum of 8 notes of 100 denominations from 4 car drivers at any point which later on be reduced to 2 notes, when he will be giving exchange to 2 bus drivers, 3 truck drivers and 1 car driver.

For next 10 vehicles, 7 bus drivers gave 500 notes making the denominations of 500 notes as 13. Therefore, 2 truck drivers and 1 car driver must have given notes in 100 Rs. currency. hence, vaibhav can have maximum of 12 notes of 100 denominations at any point.

Now, when last 10 vehicles are starting to pass, consider that the first vehicle to pass is a car and gave two notes of 100 Rs. and thus vaibhav will now have 14 100 currency notes which will be maximum with him at any point.

So, maximum 100 Rs. notes he can have at any point is 14.

FeedBack

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

At a newly opened lane in a toll plaza, only three types of vehicles are allowed i.e. bus, truck, and car. The charges for each type of vehicle are Rs. 500, Rs. 400 and Rs. 200 respectively. Every vehicle that passed through the toll plaza paid either in the denomination of Rs. 500 or Rs. 100. Vaibhav, the toll plaza executive had no cash at the starting of the toll plaza and at no instance, he had the shortage of the change during the time frame mentioned i.e. if a driver gave him Rs. 500 and wanted Rs. 100 back, at such instances he always had the change.

Vaibhav counted the denomination after every 10 vehicles passed the toll and he did this three times so as not to forget everything due to heavy rush. Further, he observed, that there is at least one vehicle of each type in every batch of 10 vehicles.

1. After the first 10 vehicles, Vaibhav noticed that he had a total of 6 currency notes of Rs. 500 and 2 currency notes of Rs. 100 each.
2. After the next 10 vehicles passed Vaibhav noticed that now he had a total of 13 currency notes of Rs. 500 and 12 currency notes of Rs. 100 each.
3. And, the final time he was able to check the currency he observed that now he had a total of 22 currency notes of Rs. 500 and 7 currency notes of Rs. 100 each.
4. Vaibhav also noticed that the maximum number of vehicle passed in first 30 vehicles were trucks.

The following questions pertain to the first thirty vehicles passed on the newly opened lane of the highway.

Q.38

Find the maximum number of trucks which offered Rs. 500 note at Toll plaza if all the bus drivers offered Rs.500 note only.

Solution:**Correct Answer : 10**
 **Bookmark**
 **Answer key/Solution**

From the information we can conclude that the money he collected after 10 vehicles has passed is Rs. 3,200. In next 10 vehicles, he must have collected Rs. 4,500 and in final 10 vehicles the amount collected is Rs. 4,000. The toll charges for a bus is Rs. 500, for a truck is Rs. 400 and for a car is Rs. 200. Further, there is at least one vehicle of each type. Now, from the information we can conclude that,

For first 10 vehicles,

$$500a + 400b + 200c = 3200$$

and, $a + b + c = 10$, where a, b and c are the number of buses, trucks and cars passed the toll respectively.

Solving the equations, we get $a = 2$, $b = 3$ and $c = 5$.

Similarly, for next 10 vehicles, equations will be

$$500a + 400b + 200c = 4500$$

and $a + b + c = 10$, then $a = 7$, $b = 2$ and $c = 1$ is the only possible solution

for final 10 vehicles,

$$500a + 400b + 200c = 4000$$

and $a + b + c = 10$, then

Three possible combinations of (a, b, c) are their

$$\begin{array}{ll} (a, b, c) = (2, 7, 1) & \dots (i) \\ = (4, 4, 2) & \dots (ii) \\ \text{or} & \dots (iii) \\ = (6, 1, 3) & \end{array}$$

Since the number of trucks were the maximum therefore only first combination i.e., $(a, b, c) = (2, 7, 1)$ is possible.

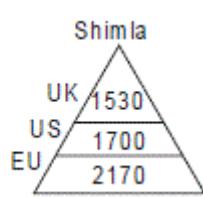
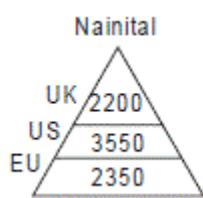
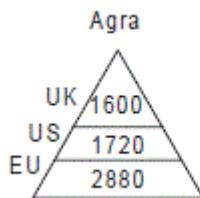
	500(Bus)	400(Truck)	200(Car)
First 10	2	3	5
11–20	7	2	1
21–30	2	7	1
	<u>11</u>	<u>12</u>	<u>7</u>

The maximum number of trucks which offered Rs. 500 note at Toll plaza if all the bus drivers offered Rs.500 note only will be 10.

 **FeedBack**

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

Married and unmarried couples from three countries - UK, US and EU visited India to explore three tourist places Agra, Nainital and Shimla. The amount spent by these couples was 20% of total amount i.e. 100 lakh dollars spent by them in their world tour. The average expenses of a couple in Agra, Nainital and Shimla was 40 dollars, 100 dollars and 100 dollars respectively. Number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14. The diagrams given below show the break-up of number of married couples from each country visiting each city.



It was also known that :-

- (I) Number of couples from EU was 1100 less than that from US but 1500 more than that from UK.
- (II) Total number of couples from UK visiting Agra and Nainital was equal to total number of unmarried couples visiting India from all the three countries.
- (III) One-third of couples visiting Agra were from US which was also equal to couples visiting Nainital from EU.
- (IV) The number of unmarried couples from EU visiting Shimla was 110 more than those visiting Agra.

Q.39

The maximum number of unmarried couples visiting a city from a particular country may be equal to

1 980

2 950

3 860

4 780

Solution:

Correct Answer : 2

Bookmark

Answer key/Solution

Amount spent in India = 20% of 100 lakh = 2000000 dollars.

According to the question, number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14.

$$\therefore 15x \times 40 + 20x \times 100 + 14x \times 100 = 2000000$$

$$\Rightarrow 4000x = 2000000$$

$$\Rightarrow x = 500$$

$$\therefore \text{Couples visiting Agra} = 15x = 7500$$

$$\text{Couples visiting Nainital} = 10000$$

$$\text{Couples visiting Shimla} = 7000$$

From statement I; Let the number of couples visiting from US be y.

According to the question;

$$(y - 1100) + y + (y - 2600) = 7500 + 10000 + 7000$$

$$\Rightarrow 3y - 3700 = 24500$$

$$\Rightarrow y = 24500 + 3700$$

$$\Rightarrow y = \frac{24500 + 3700}{3} = \frac{28200}{3} = 9400.$$

\therefore Number of couples from UK, US and EU were 6800, 9400 and 8300 respectively.

Now, the information given in the question may be tabulated as below:

Country	Agra		Nainital		Shimla	
	Married	Unmarried	Married	Unmarried	Married	Unmarried
UK	1600		2200		1530	
US	1720		3550		1700	
EU	2880		2350		2170	

Total couples = 24500

Total married couples = $(1600 + 1720 + 2880) + (2200 + 3550 + 2350) + (1530 + 1700 + 2170) = 6200 + 8100 + 5400 = 19700$

Total unmarried couples = $24500 - 19700 = 4800$.

From statement III, couples from US visiting Agra = Couples from EU visiting Nainital

$$= \frac{1}{3} \times (\text{Total couples visiting Agra}) = \frac{1}{3} \times 7500 = 2500$$

\therefore Unmarried couples from US visiting Agra = $2500 - 1720 = 780$.

Unmarried couples from EU visiting Nainital = $2500 - 2350 = 150$.

Couples visiting three cities are as below:-

Let couples from UK visiting Agra be a.

City Country	Agra	Nainital	Shimla
UK	a	4800 - a	2000
US	2500	a + 2700	4200 - a
EU	500 - a	2500	a + 800

From statement II, couples from UK visiting Shimla = $6800 - 4800 = 2000$.

Number of unmarried couples from EU visiting Shimla = $a + 800 - 2170 = a - 1370$

Number of unmarried couples from EU visiting Agra = $500 - a - 2880 = 2120 - a$

From statement IV;

$$a - 1370 = 2120 - a + 110$$

$$\Rightarrow 2a = 2120 + 110 + 1370 = 3600$$

$$\therefore a = 1800$$

Now, the couples visiting three cities are as below:-

City Country	Agra	Nainital	Shimla
UK	1800	3000	2000
US	2500	4500	2400
EU	3200	2500	2600

Number of unmarried couples visiting 3 cities areas below :-

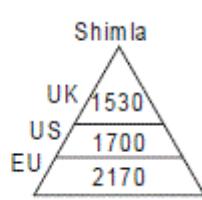
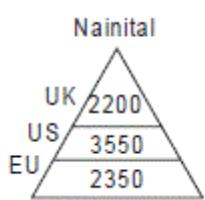
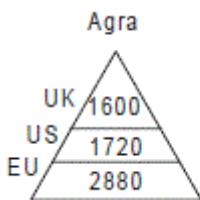
City Country	Agra	Nainital	Shimla	Total
UK	200	800	470	1470
US	780	950	700	2430
EU	320	150	430	900
Total	1300	1900	1600	4800

Unmarried couples from US visiting Nainital was the maximum i.e., 950.

FeedBack

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

Married and unmarried couples from three countries - UK, US and EU visited India to explore three tourist places Agra, Nainital and Shimla. The amount spent by these couples was 20% of total amount i.e. 100 lakh dollars spent by them in their world tour. The average expenses of a couple in Agra, Nainital and Shimla was 40 dollars, 100 dollars and 100 dollars respectively. Number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14. The diagrams given below show the break-up of number of married couples from each country visiting each city.



It was also known that :-

- (I) Number of couples from EU was 1100 less than that from US but 1500 more than that from UK.
- (II) Total number of couples from UK visiting Agra and Nainital was equal to total number of unmarried couples visiting India from all the three countries.
- (III) One-third of couples visiting Agra were from US which was also equal to couples visiting Nainital from EU.
- (IV) The number of unmarried couples from EU visiting Shimla was 110 more than those visiting Agra.

Q.40

What percentage (approximate) of couples visiting from US were unmarried?

- 1 27.29%
- 2 26.12%
- 3 25.85%
- 4 24.68%

Solution:

Correct Answer : 3

Bookmark

Answer key/Solution

Amount spent in India = 20% of 100 lakh = 2000000 dollars.

According to the question, number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14.

$$\therefore 15x \times 40 + 20x \times 100 + 14x \times 100 = 2000000$$

$$\Rightarrow 4000x = 2000000$$

$$\Rightarrow x = 500$$

$$\therefore \text{Couples visiting Agra} = 15x = 7500$$

$$\text{Couples visiting Nainital} = 10000$$

$$\text{Couples visiting Shimla} = 7000$$

From statement I; Let the number of couples visiting from US be y.

According to the question;

$$(y - 1100) + y + (y - 2600) = 7500 + 10000 + 7000$$

$$\Rightarrow 3y - 3700 = 24500$$

$$\Rightarrow y = 24500 + 3700$$

$$\Rightarrow y = \frac{24500 + 3700}{3} = \frac{28200}{3} = 9400.$$

\therefore Number of couples from UK, US and EU were 6800, 9400 and 8300 respectively.

Now, the information given in the question may be tabulated as below:

Country	Agra		Nainital		Shimla	
	Married	Unmarried	Married	Unmarried	Married	Unmarried
UK	1600		2200		1530	
US	1720		3550		1700	
EU	2880		2350		2170	

Total couples = 24500

Total married couples = $(1600 + 1720 + 2880) + (2200 + 3550 + 2350) + (1530 + 1700 + 2170) = 6200 + 8100 + 5400 = 19700$

Total unmarried couples = $24500 - 19700 = 4800$.

From statement III, couples from US visiting Agra = Couples from EU visiting Nainital

$$= \frac{1}{3} \times (\text{Total couples visiting Agra}) = \frac{1}{3} \times 7500 = 2500$$

\therefore Unmarried couples from US visiting Agra = $2500 - 1720 = 780$.

Unmarried couples from EU visiting Nainital = $2500 - 2350 = 150$.

Couples visiting three cities are as below:-

Let couples from UK visiting Agra be a.

City Country	Agra	Nainital	Shimla
UK	a	4800 - a	2000
US	2500	a + 2700	4200 - a
EU	500 - a	2500	a + 800

From statement II, couples from UK visiting Shimla = $6800 - 4800 = 2000$.

Number of unmarried couples from EU visiting Shimla = $a + 800 - 2170 = a - 1370$

Number of unmarried couples from EU visiting Agra = $500 - a - 2880 = 2120 - a$

From statement IV;

$$a - 1370 = 2120 - a + 110$$

$$\Rightarrow 2a = 2120 + 110 + 1370 = 3600$$

$$\therefore a = 1800$$

Now, the couples visiting three cities are as below:-

City Country	Agra	Nainital	Shimla
UK	1800	3000	2000
US	2500	4500	2400
EU	3200	2500	2600

Number of unmarried couples visiting 3 cities areas below :-

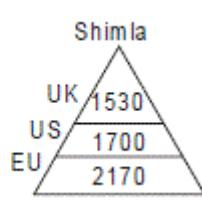
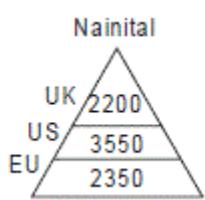
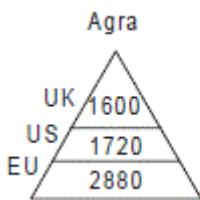
City Country	Agra	Nainital	Shimla	Total
UK	200	800	470	1470
US	780	960	700	2430
EU	320	150	430	900
Total	1300	1900	1600	4800

$$\text{Required percentage} = \frac{2430}{9400} \times 100 = 25.85\%$$

FeedBack

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

Married and unmarried couples from three countries - UK, US and EU visited India to explore three tourist places Agra, Nainital and Shimla. The amount spent by these couples was 20% of total amount i.e. 100 lakh dollars spent by them in their world tour. The average expenses of a couple in Agra, Nainital and Shimla was 40 dollars, 100 dollars and 100 dollars respectively. Number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14. The diagrams given below show the break-up of number of married couples from each country visiting each city.



It was also known that :-

- (I) Number of couples from EU was 1100 less than that from US but 1500 more than that from UK.
- (II) Total number of couples from UK visiting Agra and Nainital was equal to total number of unmarried couples visiting India from all the three countries.
- (III) One-third of couples visiting Agra were from US which was also equal to couples visiting Nainital from EU.
- (IV) The number of unmarried couples from EU visiting Shimla was 110 more than those visiting Agra.

Q.41

All unmarried persons visiting Agra from two among the three countries get married with a person from another country, that is, a male from UK can marry only the female either from US or EU, such that all the couples from exactly two of the countries get married, then what is the difference between the maximum and minimum number of couples who were still unmarried?

1 0

2 130

3 520

4 None of these

Solution:

Correct Answer : 4

Bookmark

Answer key/Solution

Amount spent in India = 20% of 100 lakh = 2000000 dollars.

According to the question, number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14.

$$\therefore 15x \times 40 + 20x \times 100 + 14x \times 100 = 2000000$$

$$\Rightarrow 4000x = 2000000$$

$$\Rightarrow x = 500$$

$$\therefore \text{Couples visiting Agra} = 15x = 7500$$

$$\text{Couples visiting Nainital} = 10000$$

$$\text{Couples visiting Shimla} = 7000$$

From statement I; Let the number of couples visiting from US be y.

According to the question;

$$(y - 1100) + y + (y - 2600) = 7500 + 10000 + 7000$$

$$\Rightarrow 3y - 3700 = 24500$$

$$\Rightarrow y = 24500 + 3700$$

$$\Rightarrow y = \frac{24500 + 3700}{3} = \frac{28200}{3} = 9400.$$

\therefore Number of couples from UK, US and EU were 6800, 9400 and 8300 respectively.

Now, the information given in the question may be tabulated as below:

Country	City		Agra		Nainital		Shimla	
	Married	Unmarried	Married	Unmarried	Married	Unmarried	Married	Unmarried
UK	1600		2200		1530			
US	1720		3550		1700			
EU	2880		2350		2170			

Total couples = 24500

Total married couples = $(1600 + 1720 + 2880) + (2200 + 3550 + 2350) + (1530 + 1700 + 2170) = 6200 + 8100 + 5400 = 19700$

Total unmarried couples = $24500 - 19700 = 4800$.

From statement III, couples from US visiting Agra = Couples from EU visiting Nainital

$$= \frac{1}{3} \times (\text{Total couples visiting Agra}) = \frac{1}{3} \times 7500 = 2500$$

\therefore Unmarried couples from US visiting Agra = $2500 - 1720 = 780$.

Unmarried couples from EU visiting Nainital = $2500 - 2350 = 150$.

Couples visiting three cities are as below:-

Let couples from UK visiting Agra be a.

Country \ City	Agra	Nainital	Shimla
UK	a	4800 - a	2000
US	2500	a + 2700	4200 - a
EU	500 - a	2500	a + 800

From statement II, couples from UK visiting Shimla = $6800 - 4800 = 2000$.

Number of unmarried couples from EU visiting Shimla = $a + 800 - 2170 = a - 1370$

Number of unmarried couples from EU visiting Agra = $500 - a - 2880 = 2120 - a$

From statement IV;

$$a - 1370 = 2120 - a + 110$$

$$\Rightarrow 2a = 2120 + 110 + 1370 = 3600$$

$$\therefore a = 1800$$

Now, the couples visiting three cities are as below:-

Country \ City	Agra	Nainital	Shimla
UK	1800	3000	2000
US	2500	4500	2400
EU	3200	2500	2600

Number of unmarried couples visiting 3 cities areas below :-

Country \ City	Agra	Nainital	Shimla	Total
UK	200	800	470	1470
US	780	950	700	2430
EU	320	150	430	900
Total	1300	1900	1600	4800

It is given that all unmarried persons visiting Agra from 2 countries got married. We can conclude that unmarried persons from UK and EU will be married as:

Number of persons in US > (number of persons in UK + no. of person in EU).

Minimum number of couples will be remained unmarried when all unmarried person gets married with persons from unmarried couples of US.

Minimum number of couples still unmarried = $780 - (200 + 3x) = 780 - 520 = 260$.

Now, maximum number of couples will be remained unmarried if 200 unmarried couples from UK gets married to 200

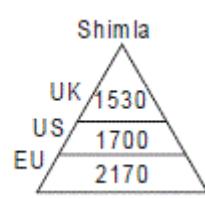
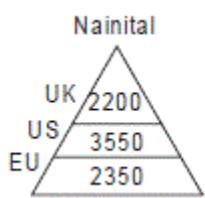
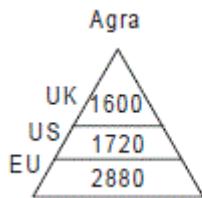
unmarried couples of EU and then 120 unmarried couples from EU will be left. Those, 120 unmarried couples if now gets married to 120 unmarried couples from US then $780 - 120 = 660$ unmarried couples will be left, which is the maximum.

$$\therefore \text{Difference} = 660 - 260 = 400.$$

FeedBack

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

Married and unmarried couples from three countries - UK, US and EU visited India to explore three tourist places Agra, Nainital and Shimla. The amount spent by these couples was 20% of total amount i.e. 100 lakh dollars spent by them in their world tour. The average expenses of a couple in Agra, Nainital and Shimla was 40 dollars, 100 dollars and 100 dollars respectively. Number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14. The diagrams given below show the break-up of number of married couples from each country visiting each city.



It was also known that :-

- (I) Number of couples from EU was 1100 less than that from US but 1500 more than that from UK.
- (II) Total number of couples from UK visiting Agra and Nainital was equal to total number of unmarried couples visiting India from all the three countries.
- (III) One-third of couples visiting Agra were from US which was also equal to couples visiting Nainital from EU.
- (IV) The number of unmarried couples from EU visiting Shimla was 110 more than those visiting Agra.

Q.42

Amount spent by couples in Nainital was by what percentage more than that spent in Shimla?

- 1 16.25%
- 2 25.54%
- 3 42.86%
- 4 40.50%

Solution:

Correct Answer : 3

Bookmark

Answer key/Solution

Amount spent in India = 20% of 100 lakh = 2000000 dollars.

According to the question, number of couples visiting Agra, Nainital and Shimla were in the ratio of 15 : 20 : 14.

$$\therefore 15x \times 40 + 20x \times 100 + 14x \times 100 = 2000000$$

$$\Rightarrow 4000x = 2000000$$

$$\Rightarrow x = 500$$

$$\therefore \text{Couples visiting Agra} = 15x = 7500$$

$$\text{Couples visiting Nainital} = 10000$$

$$\text{Couples visiting Shimla} = 7000$$

From statement I; Let the number of couples visiting from US be y.

According to the question;

$$(y - 1100) + y + (y - 2600) = 7500 + 10000 + 7000$$

$$\Rightarrow 3y - 3700 = 24500$$

$$\Rightarrow y = 24500 + 3700$$

$$\Rightarrow y = \frac{24500 + 3700}{3} = \frac{28200}{3} = 9400.$$

Δ Number of couples from UK, US and EU were 6800, 9400 and 8300 respectively.

Now, the information given in the question may be tabulated as below:

Country	Agra		Nainital		Shimla	
	Married	Unmarried	Married	Unmarried	Married	Unmarried
UK	1600		2200		1530	
US	1720		3550		1700	
EU	2880		2350		2170	

Total couples = 24500

Total married couples = $(1600 + 1720 + 2880) + (2200 + 3550 + 2350) + (1530 + 1700 + 2170) = 6200 + 8100 + 5400 = 19700$

Total unmarried couples = $24500 - 19700 = 4800$.

From statement III, couples from US visiting Agra = Couples from EU visiting Nainital

$$= \frac{1}{3} \times (\text{Total couples visiting Agra}) = \frac{1}{3} \times 7500 = 2500$$

Δ Unmarried couples from US visiting Agra = $2500 - 1720 = 780$.

Unmarried couples from EU visiting Nainital = $2500 - 2350 = 150$.

Couples visiting three cities are as below:-

Let couples from UK visiting Agra be a.

City Country	Agra	Nainital	Shimla
UK	a	4800 - a	2000
US	2500	a + 2700	4200 - a
EU	500 - a	2500	a + 800

From statement II, couples from UK visiting Shimla = $6800 - 4800 = 2000$.

Number of unmarried couples from EU visiting Shimla = $a + 800 - 2170 = a - 1370$

Number of unmarried couples from EU visiting Agra = $500 - a - 2880 = 2120 - a$

From statement IV;

$$a - 1370 = 2120 - a + 110$$

$$\Rightarrow 2a = 2120 + 110 + 1370 = 3600$$

$$\therefore a = 1800$$

Now, the couples visiting three cities are as below:-

City Country	Agra	Nainital	Shimla
UK	1800	3000	2000
US	2500	4500	2400
EU	3200	2500	2600

Number of unmarried couples visiting 3 cities areas below :-

City Country	Agra	Nainital	Shimla	Total
UK	200	800	470	1470
US	780	950	700	2430
EU	320	150	430	900
Total	1300	1900	1600	4800

$$\text{Required percentage} = \frac{(10000 \times 100) - (7000 \times 100)}{(7000 \times 100)} \times 100 = 42.86\%.$$

[FeedBack](#)

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

Eight players - P, Q, R, S, T, V, W and X - out of which three batsman, two bowler, two all rounder and one wicket keeper were sitting on a bench. Four players were facing towards North and remaining towards South. No batsman was sitting to the left of any bowler. Both all rounders were sitting next to each other but in opposite direction. The additional information was as below:-

- (I) The wicket keeper was sitting to the immediate left of S, a batsman. T was sitting at any of the end position.
 - (II) R, a bowler was not an immediate neighbour of T and V was sitting to the right of S.
 - (III) Two players were sitting between Q and T and three persons (not batsman) were sitting between S and W.
 - (IV) R was second to the right of Q and was facing opposite of Q.
 - (V) P, neither batsman nor bowler, was facing North.
-

Q.43

Who was wicket keeper?

1 P

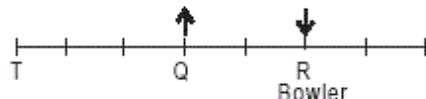
2 Q

3 V

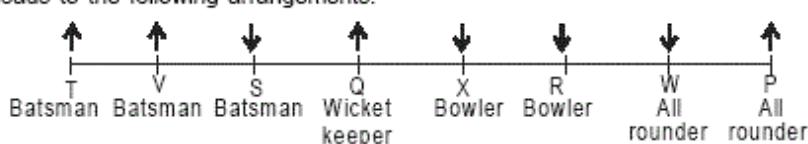
4 X

Solution:**Correct Answer : 2****Bookmark****Answer key/Solution**

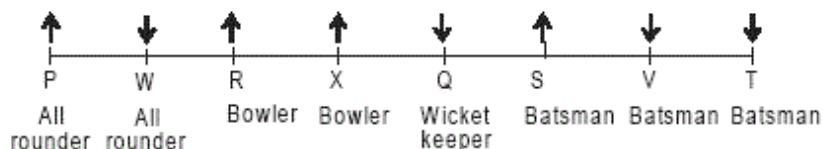
Case I:- T was sitting at left end. We can make the following arrangement as per the instruction (from statement I). From statement III, two players were sitting between Q and T. As per statement IV and II, R, a bowler was second to the right of Q and was not an immediate neighbour of T.



As per the instruction; we can conclude that; No batsman can sit at second position from right end because it is given that no batsman was sitting to the left of bowler. From statement III, only position at which S can sit is position number 3 or 7 from left end. But, if 'S' would be sitting at position number 7 from left end, there must be at least one Batsman who would be sitting between S and W, which is not allowed as per instructions. So, we can conclude that S was sitting at 3rd position from left end. Now, we can also conclude that three Batsmen were sitting at 1st, 2nd and 3rd position from left end and Q must be wicketkeeper as wicketkeeper was sitting to the immediate left of S. In this case, S would be facing towards South. Since two all-rounders were sitting together, they must sit at two right most positions. Some further analysis leads to the following arrangements.



Case II:- T was sitting at the right end. Similar analysis as that in case I leads to the following arrangements:-



Q was wicket keeper.

FeedBack

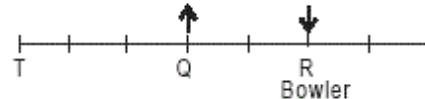
Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Eight players - P, Q, R, S, T, V, W and X - out of which three batsman, two bowler, two all rounder and one wicket keeper were sitting on a bench. Four players were facing towards North and remaining towards South. No batsman was sitting to the left of any bowler. Both all rounders were sitting next to each other but in opposite direction. The additional information was as below:-

- (I) The wicket keeper was sitting to the immediate left of S, a batsman. T was sitting at any of the end position.
- (II) R, a bowler was not an immediate neighbour of T and V was sitting to the right of S.
- (III) Two players were sitting between Q and T and three persons (not batsman) were sitting between S and W.
- (IV) R was second to the right of Q and was facing opposite of Q.
- (V) P, neither batsman nor bowler, was facing North.

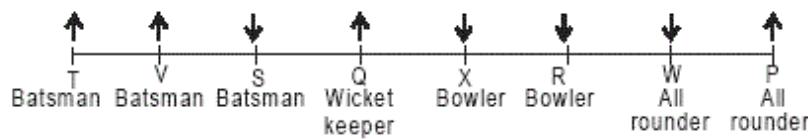
Q.44**Who were all rounder?**1 P and Q2 W and X3 P and X4 P and W**Solution:****Correct Answer : 4****Bookmark****Answer key/Solution**

Case I:- T was sitting at left end. We can make the following arrangement as per the instruction (from statement I). From statement III, two players were sitting between Q and T. As per statement IV and II, R, a bowler was second to the right of Q and was not an immediate neighbour of T.

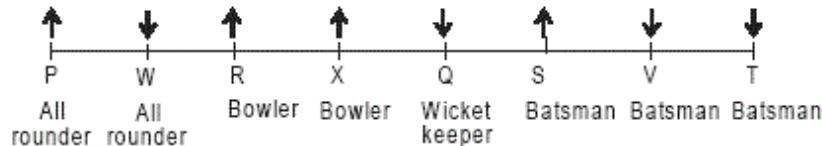


As per the instruction; we can conclude that; No batsman can sit at second position from right end because it is given that no batsman was sitting to the left of bowler. From statement III, only position at which S can sit is position number 3 or 7 from left end. But, if 'S' would be sitting at position number 7 from left end, there must be at least one Batsman who would be sitting between S and W, which is not allowed as per instructions. So, we can conclude that S was sitting at 3rd position from left end. Now, we can also conclude that three Batsmen were sitting at 1st, 2nd and 3rd position from left end and Q must be wicketkeeper as wicketkeeper was sitting to the immediate left of S. In this case, S would be facing towards South, Since two all-rounders were sitting together, they must sit at two right most positions.

Some further analysis leads to the following arrangements.



Case II:- T was sitting at the right end. Similar analysis as that in case I leads to the following arrangements:-



P and W were all-rounders.

FeedBack

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

Eight players - P, Q, R, S, T, V, W and X - out of which three batsman, two bowler, two all rounder and one wicket keeper were sitting on a bench. Four players were facing towards North and remaining towards South. No batsman was sitting to the left of any bowler. Both all rounders were sitting next to each other but in opposite direction. The additional information was as below:-

- (I) The wicket keeper was sitting to the immediate left of S, a batsman. T was sitting at any of the end position.
- (II) R, a bowler was not an immediate neighbour of T and V was sitting to the right of S.
- (III) Two players were sitting between Q and T and three persons (not batsman) were sitting between S and W.
- (IV) R was second to the right of Q and was facing opposite of Q.
- (V) P, neither batsman nor bowler, was facing North.

Q.45

Who were sitting between Q and T?

1 S and X

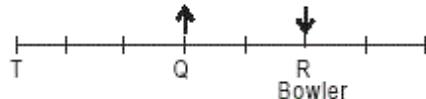
2 X and V

3 S and V

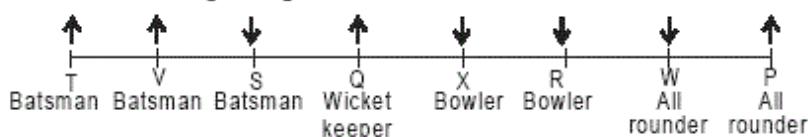
4 X and W

Solution:**Correct Answer : 3****Bookmark****Answer key/Solution**

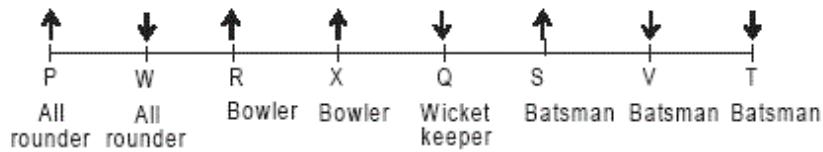
Case I:- T was sitting at left end. We can make the following arrangement as per the instruction (from statement I). From statement III, two players were sitting between Q and T. As per statement IV and II, R, a bowler was second to the right of Q and was not an immediate neighbour of T.



As per the instruction; we can conclude that; No batsman can sit at second position from right end because it is given that no batsman was sitting to the left of bowler. From statement III, only position at which S can sit is position number 3 or 7 from left end. But, if 'S' would be sitting at position number 7 from left end, there must be at least one Batsman who would be sitting between S and W, which is not allowed as per instructions. So, we can conclude that S was sitting at 3rd position from left end. Now, we can also conclude that three Batsmen were sitting at 1st, 2nd and 3rd position from left end and Q must be wicketkeeper as wicketkeeper was sitting to the immediate left of S. In this case, S would be facing towards South. Since two all-rounders were sitting together, they must sit at two right most positions. Some further analysis leads to the following arrangements.



Case II:- T was sitting at the right end. Similar analysis as that in case I leads to the following arrangements:-



S and V sit between Q and T.

FeedBack

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

Eight players - P, Q, R, S, T, V, W and X - out of which three batsman, two bowler, two all rounder and one wicket keeper were sitting on a bench. Four players were facing towards North and remaining towards South. No batsman was sitting to the left of any bowler. Both all rounders were sitting next to each other but in opposite direction. The additional information was as below:-

- (I) The wicket keeper was sitting to the immediate left of S, a batsman. T was sitting at any of the end position.
- (II) R, a bowler was not an immediate neighbour of T and V was sitting to the right of S.
- (III) Two players were sitting between Q and T and three persons (not batsman) were sitting between S and W.
- (IV) R was second to the right of Q and was facing opposite of Q.
- (V) P, neither batsman nor bowler, was facing North.

Q.46

How many of the following statements is/are not true?

- (I) X was sitting to the right of Q.
- (II) T and V were batsman.
- (III) S may face North as well as South direction
- (IV) Two bowler were sitting next to each other.

Solution:

Correct Answer : 0

 **Bookmark**

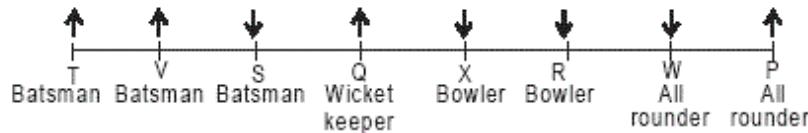
 **Answer key/Solution**

Case I:- T was sitting at left end. We can make the following arrangement as per the instruction (from statement I). From statement III, two players were sitting between Q and T. As per statement IV and II, R, a bowler was second to the right of Q and was not an immediate neighbour of T.

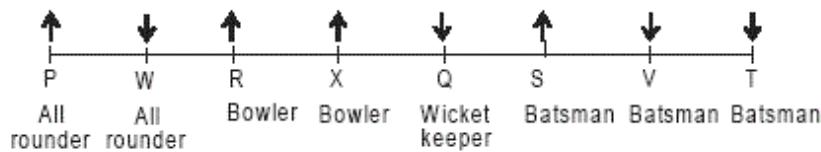


As per the instruction; we can conclude that; No batsman can sit at second position from right end because it is given that no batsman was sitting to the left of bowler. From statement III, only position at which S can sit is position number 3 or 7 from left end. But, if 'S' would be sitting at position number 7 from left end, there must be at least one Batsman who would be sitting between S and W, which is not allowed as per instructions. So, we can conclude that S was sitting at 3rd position from left end. Now, we can also conclude that three Batsmen were sitting at 1st, 2nd and 3rd position from left end and Q must be wicketkeeper as wicketkeeper was sitting to the immediate left of S. In this case, S would be facing towards South, Since two all-rounders were sitting together, they must sit at two right most positions.

Some further analysis leads to the following arrangements.



Case II:- T was sitting at the right end. Similar analysis as that in case I leads to the following arrangements:-



All statements are true. Therefore, answer is zero.

FeedBack

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

Yatharth, a four years old kid and learning enthusiast creates 6X6 grid and starts writing English alphabets from A to Z. But while writing, he missed some of the cells in the grid willingly and writes all the alphabets in order by following certain conditions.

1. There are at least 3 letters in each row and each column. Also, there is exactly one row and column which has three alphabets.
2. No column has all cells filled but this is not true for rows.
3. F and M is the first alphabet used in column 2 and column 6 respectively.
4. O is the third letter used in column 4.
5. There is at least one empty box between L and M.
6. Only 5th row has all the boxes filled.
7. Column 1 has maximum number of vowels.
8. H and Z are in same column.

Q.47

In how many different ways all the boxes can be filled?

1 10

2 12

3 13

4 None of these

Solution:

Correct Answer : 4

 **Bookmark**

 **Answer key/Solution**

From statement 1, 2 and 6 we can deduce that rows of this grid will have 3, 4, 4, 4, 5 and 6 letters in each row in no specific order. It is known for sure that row 5 will have 6 alphabets. Similarly, for columns we can deduce that the columns of the grid will have 3, 4, 4, 5, 5, 5 alphabets in the columns in no specific order. Since M is first alphabet in column 6, it is clear that we are filling the alphabets row-wise following the order A to Z. So, in 1st row A, B, C and D must be filled in 1st, 3rd, 4th and 5th places. Further, E will be in 1st column of 2nd row followed by F. Now, F is the first alphabet in column 2, therefore, the grid will look like this till alphabet F.

A		B	C	D	
E	F				

Row 2 can have either 4 or 5 alphabets. If you now consider the case with 5 alphabets you will observe that it will contradict the statement 7 that is, column 1 maximum number of vowels. Therefore, Row 2 will have 4 alphabets i.e., E, F, G and H. From statement 7th, 'I' must be in column 1st and rest of the letters to be placed such that there is a gap of one box between L and M (by statement 5). Also, it is given that O is the third letter used in fourth column. Now, we get a grid that looks like:

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O			

Row 5 has 6 alphabets, therefore row 4 and row 6 can have two combinations of alphabets possible i.e., (4, 3) or (3, 4). Two different possibilities with some of the alphabets missing are:

Case 1

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O		P	
Q	R	S	T	U	V
			Z		

Case 2

A		B	C	D	
E	F	G		H	
I	J	K	L		M
			O	P	Q
R	S	T	U	V	W
				Z	

From statement 3 and 4, we can conclude that, only N can occupy any of the first three boxes of row four.

In case 1, we need to place letter N and w, x, y.

In case 2, we need to place N with x, y.

Case 1

- If N is in column 1, only one possibility is as W cannot be placed in column 1.
- If N is in column 2, there are 4 possibilities.
- If N is in column 3, there is only 1 possibility.

Case 2

- If N is in column 1, there are 2 possibilities.
- If N is in column 2, there are 6 possible ways in which x and y could be placed.
- If N is in column 3, there are 2 possible ways.

In 16 different ways all the boxes can be filled.

FeedBack

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

Yatharth, a four years old kid and learning enthusiast creates 6X6 grid and starts writing English alphabets from A to Z. But while writing, he missed some of the cells in the grid willingly and writes all the alphabets in order by following certain conditions.

1. There are at least 3 letters in each row and each column. Also, there is exactly one row and column which has three alphabets.
2. No column has all cells filled but this is not true for rows.
3. F and M is the first alphabet used in column 2 and column 6 respectively.
4. O is the third letter used in column 4.
5. There is at least one empty box between L and M.
6. Only 5th row has all the boxes filled.
7. Column 1 has maximum number of vowels.
8. H and Z are in same column.

Q.48

If N is in the same column of Y then, how many different places are possible for X?

1 1

2 2

3 3

4 4

Solution:

Correct Answer : 1

 **Bookmark**

 **Answer key/Solution**

From statement 1, 2 and 6 we can deduce that rows of this grid will have 3, 4, 4, 4, 5 and 6 letters in each row in no specific order. It is known for sure that row 5 will have 6 alphabets. Similarly, for columns we can deduce that the columns of the grid will have 3, 4, 4, 5, 5, 5 alphabets in the columns in no specific order. Since M is first alphabet in column 6, it is clear that we are filling the alphabets row-wise following the order A to Z. So, in 1st row A, B, C and D must be filled in 1st, 3rd, 4th and 5th places. Further, E will be in 1st column of 2nd row followed by F. Now, F is the first alphabet in column 2, therefore, the grid will look like this till alphabet F.

A		B	C	D	
E	F				

Row 2 can have either 4 or 5 alphabets. If you now consider the case with 5 alphabets you will observe that it will contradict the statement 7 that is, column 1 maximum number of vowels. Therefore, Row 2 will have 4 alphabets i.e., E, F, G and H. From statement 7th, 'I' must be in column 1st and rest of the letters to be placed such that there is a gap of one box between L and M (by statement 5). Also, it is given that O is the third letter used in fourth column. Now, we get a grid that looks like:

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O			

Row 5 has 6 alphabets, therefore row 4 and row 6 can have two combinations of alphabets possible i.e., (4, 3) or (3, 4). Two different possibilities with some of the alphabets missing are:

Case 1

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O		P	
Q	R	S	T	U	V
			Z		

Case 2

A		B	C	D	
E	F	G		H	
I	J	K	L		M
			O	P	Q
R	S	T	U	V	W
				Z	

From statement 3 and 4, we can conclude that, only N can occupy any of the first three boxes of row four.

In case 1, we need to place letter N and W, X, Y.

In case 2, we need to place N with X, Y.

Case 1

- If N is in column 1, only one possibility is as W cannot be placed in column 1.
- If N is in column 2, there are 4 possibilities.
- If N is in column 3, there is only 1 possibility.

Case 2

- If N is in column 1, there are 2 possibilities.
- If N is in column 2, there are 6 possible ways in which X and Y could be placed.
- If N is in column 3, there are 2 possible ways.

Case 1 is not possible and in case 2 if N and Y are in 2nd column then only 1 way is possible to place X.

FeedBack

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

Yatharth, a four years old kid and learning enthusiast creates 6X6 grid and starts writing English alphabets from A to Z. But while writing, he missed some of the cells in the grid willingly and writes all the alphabets in order by following certain conditions.

1. There are at least 3 letters in each row and each column. Also, there is exactly one row and column which has three alphabets.
2. No column has all cells filled but this is not true for rows.
3. F and M is the first alphabet used in column 2 and column 6 respectively.
4. O is the third letter used in column 4.
5. There is at least one empty box between L and M.
6. Only 5th row has all the boxes filled.
7. Column 1 has maximum number of vowels.
8. H and Z are in same column.

Q.49

Which of the following alphabets could be in same column?

1 M,Q,W

2 F, K, N,T

3 C,H,O,V

4 A,E, J,R

Solution:

Correct Answer : 1

 **Bookmark**

 **Answer key/Solution**

From statement 1, 2 and 6 we can deduce that rows of this grid will have 3, 4, 4, 4, 5 and 6 letters in each row in no specific order. It is known for sure that row 5 will have 6 alphabets. Similarly, for columns we can deduce that the columns of the grid will have 3, 4, 4, 5, 5, 5 alphabets in the columns in no specific order. Since M is first alphabet in column 6, it is clear that we are filling the alphabets row-wise following the order A to Z. So, in 1st row A, B, C and D must be filled in 1st, 3rd, 4th and 5th places. Further, E will be in 1st column of 2nd row followed by F. Now, F is the first alphabet in column 2, therefore, the grid will look like this till alphabet F.

A		B	C	D	
E	F				

Row 2 can have either 4 or 5 alphabets. If you now consider the case with 5 alphabets you will observe that it will contradict the statement 7 that is, column 1 maximum number of vowels. Therefore, Row 2 will have 4 alphabets i.e., E, F, G and H. From statement 7th, 'I' must be in column 1st and rest of the letters to be placed such that there is a gap of one box between L and M (by statement 5). Also, it is given that O is the third letter used in fourth column. Now, we get a grid that looks like:

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O			

Row 5 has 6 alphabets, therefore row 4 and row 6 can have two combinations of alphabets possible i.e., (4, 3) or (3, 4). Two different possibilities with some of the alphabets missing are:

Case 1

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O		P	
Q	R	S	T	U	V
			Z		

Case 2

A		B	C	D	
E	F	G		H	
I	J	K	L		M
			O	P	Q
R	S	T	U	V	W
				Z	

From statement 3 and 4, we can conclude that, only N can occupy any of the first three boxes of row four.

In case 1, we need to place letter N and w, x, y.

In case 2, we need to place N with x, y.

Case 1

- If N is in column 1, only one possibility is as W cannot be placed in column 1.
- If N is in column 2, there are 4 possibilities.
- If N is in column 3, there is only 1 possibility.

Case 2

- If N is in column 1, there are 2 possibilities.
- If N is in column 2, there are 6 possible ways in which x and y could be placed.
- If N is in column 3, there are 2 possible ways.

M, Q, W could be in same column.

FeedBack

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

Yatharth, a four years old kid and learning enthusiast creates 6X6 grid and starts writing English alphabets from A to Z. But while writing, he missed some of the cells in the grid willingly and writes all the alphabets in order by following certain conditions.

1. There are at least 3 letters in each row and each column. Also, there is exactly one row and column which has three alphabets.
2. No column has all cells filled but this is not true for rows.
3. F and M is the first alphabet used in column 2 and column 6 respectively.
4. O is the third letter used in column 4.
5. There is at least one empty box between L and M.
6. Only 5th row has all the boxes filled.
7. Column 1 has maximum number of vowels.
8. H and Z are in same column.

Q.50

How many different positions can be occupied by L?

1 1

2 2

3 3

4 4

Solution:

Correct Answer : 1

 **Bookmark**

 **Answer key/Solution**

From statement 1, 2 and 6 we can deduce that rows of this grid will have 3, 4, 4, 4, 5 and 6 letters in each row in no specific order. It is known for sure that row 5 will have 6 alphabets. Similarly, for columns we can deduce that the columns of the grid will have 3, 4, 4, 5, 5, 5 alphabets in the columns in no specific order. Since M is first alphabet in column 6, it is clear that we are filling the alphabets row-wise following the order A to Z. So, in 1st row A, B, C and D must be filled in 1st, 3rd, 4th and 5th places. Further, E will be in 1st column of 2nd row followed by F. Now, F is the first alphabet in column 2, therefore, the grid will look like this till alphabet F.

A		B	C	D	
E	F				

Row 2 can have either 4 or 5 alphabets. If you now consider the case with 5 alphabets you will observe that it will contradict the statement 7 that is, column 1 maximum number of vowels. Therefore, Row 2 will have 4 alphabets i.e., E, F, G and H. From statement 7th, 'I' must be in column 1st and rest of the letters to be placed such that there is a gap of one box between L and M (by statement 5). Also, it is given that O is the third letter used in fourth column. Now, we a grid that looks like:

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O			

Row 5 have 6 alphabets, therefore row 4 and row 6 can have two combinations of alphabets possible i.e., (4, 3) or (3, 4). Two different possibilities with some of the alphabets missing are:

Case 1

A		B	C	D	
E	F	G		H	
I	J	K	L		M
		O		P	
Q	R	S	T	U	V
			Z		

Case 2

A		B	C	D	
E	F	G		H	
I	J	K	L		M
			O	P	Q
R	S	T	U	V	W
				Z	

From statement 3 and 4, we can conclude that, only N can occupy any of the first three boxes of row four.

In case 1, we need to place letter N and w, x, y.

In case 2, we need to place N with x, y.

Case 1

- If N is in column 1, only one possibility is as W cannot be placed in column 1.
- If N is in column 2, there are 4 possibility.
- If N is in column 3, there is only 1 possibility.

Case 2

- If N is in column 1, there are 2 possibilities.
- If N is in column 2, there are 6 possible ways in which x and y could be placed.
- If N is in column 3, there are 2 possible ways.

Only 1 position can be occupied by L.

FeedBack

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

All the members of a newly established colony pay Rakh-Rakhao tax for the maintenance of the colony. Members are categorised as either salaried person, Businessman or pensioner and belong to income group of either less than 5 lakh per annum, 5 lakh to 10 lakh or more than 10 lakh per annum. Tax paid by salaried person, Businessman and pensioner, each having income upto 5 lakh are in the ratio of 10 : 12 : 5 and that by members having income 5 lakh to 10 lakh and more than 10 lakh are 10% and 20% more than that by respective professionals having income upto 5 lakh. The total tax collection in the colony was Rs. 17518500/- [NOTE :- Rakh-Rakhao tax paid by each professionals of same category falling under same income group are same.]

The additional information is as below:-

- (I) Number of salaried persons having income upto 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.
- (II) Total tax collected from pensioners having income less than 5 lakh was one-third of that by salaried persons belonging to the same income group.
- (III) There were 7240 businessmen in the colony. Average of the tax paid by pensioners was Rs. 825.
- (IV) Tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Q.51

A businessman having income 7 lakh per annum pay tax (in Rs.) of

Solution:

Correct Answer : 1980

 **Bookmark**

 **Answer key/Solution**

The given information can be tabulated as below:-

Let the tax paid by Salaried person Business man and pensioner having income less than 5 lakh Rs. 100x, Rs. 120x and Rs. 50x respectively.

Category Income	Salaried	Business man	Pensioner
< 5 lakh	100 x	120 x	50 x
10 ≥ Income ≥ 5	110 x	132 x	55 x
Income > 10 lakh	120 x	144 x	60 x

Let the total tax collection from Pensioners and Business man having income upto 5 lakh be Rs. a and Rs. b respectively. From statement II, total collection from salaried person having income less than 5 lakh = Rs. 3a.

From statement I, number of salaried persons having income less than 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.

From statement IV, tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Also, number of members in any category = $\frac{\text{Total tax collection}}{\text{Tax paid by each professional}}$

∴ The table will look like:

Category Income Group	Salaried Person		Business man		Pensioner	
	Number of members	Total collection (in Rs.)	No. of members	Total collections (in Rs.)	No. of members	Total collection (in Rs.)
Income < 5 lakh	3a	3a	b	b	a	a

	100x	120x	50x	
10 lakh \geq Income \geq 5 lakh	$\frac{2a}{100x}$	$\frac{b}{132x}$	$\frac{a}{50x}$	$\frac{55a}{50}$
Income $>$ 10 lakh	$\frac{5a}{100x}$	$\frac{b}{144x}$	$\frac{a}{50x}$	$\frac{60a}{50}$

$$\text{Total no. of businessman} = \frac{b}{120x} + \frac{b}{132x} + \frac{b}{144x} = \frac{132b + 120b + 110b}{15840x} = \frac{362b}{15840x}$$

As per the question;

$$\frac{362b}{15840x} = 7240$$

$$\Rightarrow b = 15840x \times 20 \dots (i)$$

$$\text{Tax collection from Pensioners} = a + \frac{55}{50}a + \frac{60}{50}a = \frac{165}{50}a$$

$$\text{Total number of Pensioners} = \frac{a}{50x} + \frac{a}{50x} + \frac{a}{50x} = \frac{3a}{50x}$$

As per the question;

$$\text{Average Tax paid by Pensioners} = \frac{\frac{165a}{50}}{\frac{3a}{50x}} = 825$$

$$\Rightarrow \frac{165a}{50} \times \frac{50x}{3a} = 825$$

$$\Rightarrow 55x = 825 \quad \therefore x = 15$$

$$\text{From equation (i), } b = 15840x \times 20 = 15840 \times 15 \times 20 = \text{Rs. 47,52,000/-}$$

$$\text{Total Tax collection} = 3b + 11.2a + \frac{165}{50}a = 3b + 14.5a = 17518500$$

$$\Rightarrow 3 \times 4752000 + 14.5a = 17518500$$

$$\Rightarrow 14.5a = 17518500 - 14256000$$

$$\Rightarrow 14.5a = 3262500$$

$$\therefore a = \frac{3262500}{29} \times 2 = 112500 \times 2 = \text{Rs. 2,25,000.}$$

Final table will look like:

Category Income Group	Total tax collection		
	Salaried person	Business man	Pensioner
Income <5 lakh	675000	4752000	225000
10 lakh \geq Income \geq 5 lakh	495000	4752000	247500
Income $>$ 10 lakh	135000	4752000	270000

$$\text{Required Tax paid} = 132x = 132 \times 15 = \text{Rs. 1,980.}$$

FeedBack

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

All the members of a newly established colony pay Rakh-Rakhao tax for the maintenance of the colony. Members are categorised as either salaried person, Businessman or pensioner and belong to income group of either less than 5 lakh per annum, 5 lakh to 10 lakh or more than 10 lakh per annum. Tax paid by salaried person, Businessman and pensioner, each having income upto 5 lakh are in the ratio of 10 : 12 : 5 and that by members having income 5 lakh to 10 lakh and more than 10 lakh are 10% and 20% more than that by respective professionals having income upto 5 lakh. The total tax collection in the colony was Rs. 17518500/- [NOTE :- Rakh-Rakhao tax paid by each professionals of same category falling under same income group are same.]

The additional information is as below:-

- (I) Number of salaried persons having income upto 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.
- (II) Total tax collected from pensioners having income less than 5 lakh was one-third of that by salaried persons belonging to the same income group.
- (III) There were 7240 businessmen in the colony. Average of the tax paid by pensioners was Rs. 825.
- (IV) Tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Q.52

Total tax paid (in Rs.) by salaried persons were

Solution:

Correct Answer : 2520000

 **Bookmark**

 **Answer key/Solution**

The given information can be tabulated as below:-

Let the tax paid by Salaried person Business man and pensioner having income less than 5 lakh Rs. 100x, Rs. 120x and Rs. 50x respectively.

Category Income	Salaried	Business man	Pensioner
< 5 lakh	100 x	120 x	50 x
10 ≥ Income ≥ 5	110 x	132 x	55 x
Income > 10 lakh	120 x	144 x	60 x

Let the total tax collection from Pensioners and Business man having income upto 5 lakh be Rs. a and Rs. b respectively. From statement II, total collection from salaried person having income less than 5 lakh = Rs. 3a.

From statement I, number of salaried persons having income less than 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.

From statement IV, tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Also, number of members in any category = $\frac{\text{Total tax collection}}{\text{Tax paid by each professional}}$

∴ The table will look like:

Category Income Group	Salaried Person		Business man		Pensioner	
	Number of members	Total collection (in Rs.)	No. of members	Total collections (in Rs.)	No. of members	Total collection (in Rs.)
Income < 5 lakh	3a	3a	b	b	a	a

	100x	120x	50x	
10 lakh \geq Income \geq 5 lakh	$\frac{2a}{100x}$	$\frac{b}{132x}$	$\frac{a}{50x}$	$\frac{55a}{50}$
Income $>$ 10 lakh	$\frac{5a}{100x}$	$\frac{b}{144x}$	$\frac{a}{50x}$	$\frac{60a}{50}$

$$\text{Total no. of businessman} = \frac{b}{120x} + \frac{b}{132x} + \frac{b}{144x} = \frac{132b + 120b + 110b}{15840x} = \frac{362b}{15840x}$$

As per the question;

$$\frac{362b}{15840x} = 7240$$

$$\Rightarrow b = 15840x \times 20 \dots (i)$$

$$\text{Tax collection from Pensioners} = a + \frac{55}{50}a + \frac{60}{50}a = \frac{165}{50}a$$

$$\text{Total number of Pensioners} = \frac{a}{50x} + \frac{a}{50x} + \frac{a}{50x} = \frac{3a}{50x}$$

As per the question;

$$\text{Average Tax paid by Pensioners} = \frac{\frac{165a}{50}}{\frac{3a}{50x}} = 825$$

$$\Rightarrow \frac{165a}{50} \times \frac{50x}{3a} = 825$$

$$\Rightarrow 55x = 825 \quad \therefore x = 15$$

$$\text{From equation (i), } b = 15840x \times 20 = 15840 \times 15 \times 20 = \text{Rs. 47,52,000/-}$$

$$\text{Total Tax collection} = 3b + 11.2a + \frac{165}{50}a = 3b + 14.5a = 17518500$$

$$\Rightarrow 3 \times 4752000 + 14.5a = 17518500$$

$$\Rightarrow 14.5a = 17518500 - 14256000$$

$$\Rightarrow 14.5a = 3262500$$

$$\therefore a = \frac{3262500}{29} \times 2 = 112500 \times 2 = \text{Rs. 2,25,000.}$$

Final table will look like:

Category Income Group	Total tax collection		
	Salaried person	Business man	Pensioner
Income <5 lakh	675000	4752000	225000
10 lakh \geq Income \geq 5 lakh	495000	4752000	247500
Income $>$ 10 lakh	135000	4752000	270000

$$\text{Required answer} = 11.2a = 11.2 \times 225000 = \text{Rs. 25,20,000/-}$$

FeedBack

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

All the members of a newly established colony pay Rakh-Rakhao tax for the maintenance of the colony. Members are categorised as either salaried person, Businessman or pensioner and belong to income group of either less than 5 lakh per annum, 5 lakh to 10 lakh or more than 10 lakh per annum. Tax paid by salaried person, Businessman and pensioner, each having income upto 5 lakh are in the ratio of 10 : 12 : 5 and that by members having income 5 lakh to 10 lakh and more than 10 lakh are 10% and 20% more than that by respective professionals having income upto 5 lakh. The total tax collection in the colony was Rs. 17518500/- [NOTE :- Rakh-Rakhao tax paid by each professionals of same category falling under same income group are same.]

The additional information is as below:-

- (I) Number of salaried persons having income upto 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.
- (II) Total tax collected from pensioners having income less than 5 lakh was one-third of that by salaried persons belonging to the same income group.
- (III) There were 7240 businessmen in the colony. Average of the tax paid by pensioners was Rs. 825.
- (IV) Tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Q.53

Total tax collection from the highest income group was by how much percentage more than by the lowest income group?

1 9.85%

2 10.17%

3 12.74%

4 14.96%

Solution:

Correct Answer : 3

 **Bookmark**

 **Answer key/Solution**

The given information can be tabulated as below:-

Let the tax paid by Salaried person Business man and pensioner having income less than 5 lakh Rs. $100x$, Rs. $120x$ and Rs. $50x$ respectively.

Income \ Category	Salaried	Business man	Pensioner
< 5 lakh	100 x	120 x	50 x
10 ≥ Income ≥ 5	110 x	132 x	55 x
Income > 10 lakh	120 x	144 x	60 x

Let the total tax collection from Pensioners and Business man having income upto 5 lakh be Rs. a and Rs. b respectively. From statement II, total collection from salaried person having income less than 5 lakh = Rs. $3a$.

From statement I, number of salaried persons having income less than 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.

From statement IV, tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Also, number of members in any category = $\frac{\text{Total tax collection}}{\text{Tax paid by each professional}}$

∴ The table will look like:

Category Income Group	Salaried Person		Business man		Pensioner	
	No. of members	Total collection (in Rs.)	No. of members	Total collections (in Rs.)	No. of members	Total collection (in Rs.)
Income < 5 lakh	$\frac{3a}{100x}$	3a	$\frac{b}{120x}$	b	$\frac{a}{50x}$	a
$10 \text{ lakh} \geq \text{Income} \geq 5 \text{ lakh}$	$\frac{2a}{100x}$	2.2a	$\frac{b}{132x}$	b	$\frac{a}{50x}$	$\frac{55a}{50}$
Income > 10 lakh	$\frac{5a}{100x}$	6a	$\frac{b}{144x}$	b	$\frac{a}{50x}$	$\frac{60a}{50}$

$$\text{Total no. of businessman} = \frac{b}{120x} + \frac{b}{132x} + \frac{b}{144x} = \frac{132b + 120b + 110b}{15840x} = \frac{362b}{15840x}$$

As per the question;

$$\frac{362b}{15840x} = 7240$$

$$\Rightarrow b = 15840x \times 20 \dots (\text{i})$$

$$\text{Tax collection from Pensioners} = a + \frac{55}{50}a + \frac{60}{50}a = \frac{165}{50}a$$

$$\text{Total number of Pensioners} = \frac{a}{50x} + \frac{a}{50x} + \frac{a}{50x} = \frac{3a}{50x}$$

As per the question;

$$\text{Average Tax paid by Pensioners} = \frac{\frac{165a}{50}}{\frac{3a}{50x}} = \frac{165a}{3a} = 825$$

$$\Rightarrow \frac{165a}{50} \times \frac{50x}{3a} = 825$$

$$\Rightarrow 55x = 825 \quad \therefore x = 15$$

From equation (i), $b = 15840x \times 20 = 15840 \times 15 \times 20 = \text{Rs. } 47,52,000/-$

$$\text{Total Tax collection} = 3b + 11.2a + \frac{165}{50}a = 3b + 14.5a = 17518500$$

$$\Rightarrow 3 \times 4752000 + 14.5a = 17518500$$

$$\Rightarrow 14.5a = 17518500 - 14256000$$

$$\Rightarrow 14.5a = 3262500$$

$$\therefore a = \frac{3262500}{29} \times 2 = 112500 \times 2 = \text{Rs. } 2,25,000.$$

Final table will look like:

Category Income Group	Total tax collection		
	Salaried person	Business man	Pensioner
Income < 5 lakh	675000	4752000	225000
$10 \text{ lakh} \geq \text{Income} \geq 5 \text{ lakh}$	495000	4752000	247500
Income > 10 lakh	135000	4752000	270000

$$\text{Required percentage} = \frac{\left(6a + b + \frac{60}{50}a\right) - (3a + b + a)}{(3a + b + a)} \times 100$$

$$= \frac{3a + \frac{a}{5}}{b + 4a} \times 100 = \frac{3 \times 225000 + 45000}{900000 + 4752000} \times 100 = \frac{720000}{5652000} \times 100 \approx 12.74\%$$

[FeedBack](#)

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

All the members of a newly established colony pay Rakh-Rakhao tax for the maintenance of the colony. Members are categorised as either salaried person, Businessman or pensioner and belong to income group of either less than 5 lakh per annum, 5 lakh to 10 lakh or more than 10 lakh per annum. Tax paid by salaried person, Businessman and pensioner, each having income upto 5 lakh are in the ratio of 10 : 12 : 5 and that by members having income 5 lakh to 10 lakh and more than 10 lakh are 10% and 20% more than that by respective professionals having income upto 5 lakh. The total tax collection in the colony was Rs. 17518500/- [NOTE :- Rakh-Rakhao tax paid by each professionals of same category falling under same income group are same.]

The additional information is as below:-

- (I) Number of salaried persons having income upto 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.
- (II) Total tax collected from pensioners having income less than 5 lakh was one-third of that by salaried persons belonging to the same income group.
- (III) There were 7240 businessmen in the colony. Average of the tax paid by pensioners was Rs. 825.
- (IV) Tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Q.54

The number of total members in the colony was

1 9420

2 9440

3 9560

4 9640

Solution:

Correct Answer : 4

 [Bookmark](#)

 [Answer key/Solution](#)

The given information can be tabulated as below:-

Let the tax paid by Salaried person Business man and pensioner having income less than 5 lakh Rs. $100x$, Rs. $120x$ and Rs. $50x$ respectively.

Income	Category	Salaried	Business man	Pensioner
< 5 lakh		$100x$	$120x$	$50x$
10 > Income > 5		$110x$	$132x$	$55x$

$10 \leq \text{Income} \leq 5$	$5 < \text{Income} \leq 10$	$10 < \text{Income} \leq 15$	$\text{Income} > 15$
Income > 10 lakh	120x	144x	60x

Let the total tax collection from Pensioners and Business man having income upto 5 lakh be Rs. a and Rs. b respectively.
From statement II, total collection from salaried person having income less than 5 lakh = Rs. 3a.

From statement I, number of salaried persons having income less than 5 lakh, 5 lakh to 10 lakh and above 10 lakh are in the ratio of 3 : 2 : 5.

From statement IV, tax collection from businessman from each income group was same whereas number of pensioners in each income group was same.

Also, number of members in any category = $\frac{\text{Total tax collection}}{\text{Tax paid by each professional}}$

∴ The table will look like:

Category Income Group	Salaried Person		Business man		Pensioner	
	No. of members	Total collection (in Rs.)	No. of members	Total collections (in Rs.)	No. of members	Total collection (in Rs.)
Income < 5 lakh	$\frac{3a}{100x}$	3a	$\frac{b}{120x}$	b	$\frac{a}{50x}$	a
$10 \text{ lakh} \geq \text{Income} \geq 5 \text{ lakh}$	$\frac{2a}{100x}$	2.2a	$\frac{b}{132x}$	b	$\frac{a}{50x}$	$\frac{55a}{50}$
Income > 10 lakh	$\frac{5a}{100x}$	6a	$\frac{b}{144x}$	b	$\frac{a}{50x}$	$\frac{60a}{50}$

$$\text{Total no. of businessman} = \frac{b}{120x} + \frac{b}{132x} + \frac{b}{144x} = \frac{132b + 120b + 110b}{15840x} = \frac{362b}{15840x}$$

As per the question;

$$\frac{362b}{15840x} = 7240$$

$$\Rightarrow b = 15840x \times 20 \dots (\text{i})$$

$$\text{Tax collection from Pensioners} = a + \frac{55}{50}a + \frac{60}{50}a = \frac{165}{50}a$$

$$\text{Total number of Pensioners} = \frac{a}{50x} + \frac{a}{50x} + \frac{a}{50x} = \frac{3a}{50x}$$

As per the question;

$$\text{Average Tax paid by Pensioners} = \frac{\frac{165a}{50}}{\frac{3a}{50x}} = 825$$

$$\Rightarrow \frac{165a}{50} \times \frac{50x}{3a} = 825$$

$$\Rightarrow 55x = 825 \quad \therefore x = 15$$

From equation (i), $b = 15840x \times 20 = 15840 \times 15 \times 20 = \text{Rs. } 47,52,000/-$

$$\text{Total Tax collection} = 3b + 11.2a + \frac{165}{50}a = 3b + 14.5a = 17518500$$

$$\Rightarrow 3 \times 4752000 + 14.5a = 17518500$$

$$\Rightarrow 14.5a = 17518500 - 14256000$$

$$\Rightarrow 14.5a = 3262500$$

$$\therefore a = \frac{3262500}{29} \times 2 = 112500 \times 2 = \text{Rs. } 2,25,000.$$

Final table will look like:

Category Income Group	Total tax collection		
	Salaried person	Business man	Pensioner
Income < 5 lakh	675000	4752000	225000
$10 \text{ lakh} \geq \text{Income} \geq 5 \text{ lakh}$	495000	4752000	247500
Income > 10 lakh	135000	4752000	270000

$$\text{Total numbers} = 7240 + \frac{a}{10x} + \frac{3a}{50x} = 7240 + \frac{225000}{10 \times 15} + \frac{3 \times 225000}{50 \times 15} = 7240 + 1500 + 900 = 9640.$$

FeedBack

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

Each of the four managers - Daljeet Singh, Prakash Tandon, Rajat Gupta and Renuka Ramnath - worked for an integral number of years in each of the three companies - RIL, TCS and ITC. The sums of the number of years spent in the three companies together were distinct for the four managers. The sums of the number of years spent by the four managers together in the RIL, TCS and ITC were 12, 13 and 14 respectively. No manager spent an equal number of years in any two companies. No two managers spent an equal number of years in any company.(Note: Each manager worked for atleast one year in each company). It is also known that:

- (i) Among the three companies, Renuka Ramnath spent the least time in TCS and the maximum in ITC.
- (ii) The number of years spent by Daljeet Singh and Rajat Gupta in ITC were 4 and 2 respectively.
- (iii) The sum of the number of years spent in the three companies together by Rajat Gupta was not less than that of Daljeet Singh.
- (iv) The sum of the number of years spent in the three companies together by Prakash Tandon was 16.
- (v) The absolute difference between the number of years spent by Daljeet Singh in RIL and the number of years spent by Rajat Gupta in TCS was 2.

Q.55

What was the absolute difference between the number of years spent by Rajat Gupta in RIL and Renuka Ramnath in ITC?

1 1

2 2

3 3

4 0

Solution:**Correct Answer : 2**
 **Bookmark**
 **Answer key/Solution**

As no manager spent an equal number of years in any two companies, each manager must have spent at least 6 years ($1 + 2 + 3$) in the three companies together.

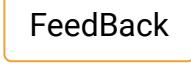
The total number of years spent by the four managers in the three companies = $12 + 13 + 14 = 39$. From statement (iv), Prakash Tandon spent 16 years in the three companies together, therefore, the total number of years spent by the other three managers was $39 - 16 = 23$.

From statement (ii), Daljeet Singh must have spent at least 7 years in the three companies together as he had spent 4 years in ITC alone. From statement (iii), the total number of years spent by Rajat Gupta in the three companies together was not less than that of Daljeet Singh. The only possibility is that Daljeet Singh spent 7 years, and Rajat Gupta and Renuka Ramnath spent 10 years and 6 years respectively.

Using statements (i), (v) and (ii) in that order along with the conclusions drawn above, the final distribution can be tabulated as given below.

Manager	Company			Total
	RIL	TCS	ITC	
Daljeet Singh	1	2	4	7
Prakash Tandon	4	7	5	16
Rajat Gupta	5	3	2	10
Renuka Ramnath	2	1	3	6
Total	12	13	14	39

Required absolute difference = $5 - 3 = 2$.

 **FeedBack**

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

Each of the four managers - Daljeet Singh, Prakash Tandon, Rajat Gupta and Renuka Ramnath - worked for an integral number of years in each of the three companies - RIL, TCS and ITC. The sums of the number of years spent in the three companies together were distinct for the four managers. The sums of the number of years spent by the four managers together in the RIL, TCS and ITC were 12, 13 and 14 respectively. No manager spent an equal number of years in any two companies. No two managers spent an equal number of years in any company.(Note: Each manager worked for atleast one year in each company). It is also known that:

- (i) Among the three companies, Renuka Ramnath spent the least time in TCS and the maximum in ITC.
- (ii) The number of years spent by Daljeet Singh and Rajat Gupta in ITC were 4 and 2 respectively.
- (iii) The sum of the number of years spent in the three companies together by Rajat Gupta was not less than that of Daljeet Singh.
- (iv) The sum of the number of years spent in the three companies together by Prakash Tandon was 16.
- (v) The absolute difference between the number of years spent by Daljeet Singh in RIL and the number of years spent by Rajat Gupta in TCS was 2.

Q.56

Among the four managers, who spent the least time in ITC?

- 1 Rajat Gupta
- 2 Prakash Tandon
- 3 Daljeet Singh
- 4 Renuka Ramnath

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

As no manager spent an equal number of years in any two companies, each manager must have spent at least 6 years ($1 + 2 + 3$) in the three companies together.

The total number of years spent by the four managers in the three companies = $12 + 13 + 14 = 39$. From statement (iv), Prakash Tandon spent 16 years in the three companies together, therefore, the total number of years spent by the other three managers was $39 - 16 = 23$.

From statement (ii), Daljeet Singh must have spent at least 7 years in the three companies together as he had spent 4 years in ITC alone. From statement (iii), the total number of years spent by Rajat Gupta in the three companies together was not less than that of Daljeet Singh. The only possibility is that Daljeet Singh spent 7 years, and Rajat Gupta and Renuka Ramnath spent 10 years and 6 years respectively.

Using statements (i), (v) and (ii) in that order along with the conclusions drawn above, the final distribution can be tabulated as given below.

Manager	Company			Total
	RIL	TCS	ITC	
Daljeet Singh	1	2	4	7
Prakash Tandon	4	7	5	16
Rajat Gupta	5	3	2	10
Renuka Ramnath	2	1	3	6
Total	12	13	14	39

Rajat Gupta spent the least time in ITC.


FeedBack

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

Each of the four managers - Daljeet Singh, Prakash Tandon, Rajat Gupta and Renuka Ramnath - worked for an integral number of years in each of the three companies - RIL, TCS and ITC. The sums of the number of years spent in the three companies together were distinct for the four managers. The sums of the number of years spent by the four managers together in the RIL, TCS and ITC were 12, 13 and 14 respectively. No manager spent an equal number of years in any two companies. No two managers spent an equal number of years in any company.(Note: Each manager worked for atleast one year in each company). It is also known that:

- (i) Among the three companies, Renuka Ramnath spent the least time in TCS and the maximum in ITC.
- (ii) The number of years spent by Daljeet Singh and Rajat Gupta in ITC were 4 and 2 respectively.
- (iii) The sum of the number of years spent in the three companies together by Rajat Gupta was not less than that of Daljeet Singh.
- (iv) The sum of the number of years spent in the three companies together by Prakash Tandon was 16.
- (v) The absolute difference between the number of years spent by Daljeet Singh in RIL and the number of years spent by Rajat Gupta in TCS was 2.

Q.57

What was the number of year(s) spent by Renuka Ramnath in TCS?

1 3

2 2

3 1

4 4

Solution:**Correct Answer : 3** **Bookmark** **Answer key/Solution**

As no manager spent an equal number of years in any two companies, each manager must have spent at least 6 years ($1 + 2 + 3$) in the three companies together.

The total number of years spent by the four managers in the three companies = $12 + 13 + 14 = 39$. From statement (iv), Prakash Tandon spent 16 years in the three companies together, therefore, the total number of years spent by the other three managers was $39 - 16 = 23$.

From statement (ii), Daljeet Singh must have spent at least 7 years in the three companies together as he had spent 4 years in ITC alone. From statement (iii), the total number of years spent by Rajat Gupta in the three companies together was not less than that of Daljeet Singh. The only possibility is that Daljeet Singh spent 7 years, and Rajat Gupta and Renuka Ramnath spent 10 years and 6 years respectively.

Using statements (i), (v) and (ii) in that order along with the conclusions drawn above, the final distribution can be tabulated as given below.

Manager	Company			Total
	RIL	TCS	ITC	
Daljeet Singh	1	2	4	7
Prakash Tandon	4	7	5	16
Rajat Gupta	5	3	2	10
Renuka Ramnath	2	1	3	6
Total	12	13	14	39

Renuka Ramnath spent 1 year in TCS.

FeedBack

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

Each of the four managers - Daljeet Singh, Prakash Tandon, Rajat Gupta and Renuka Ramnath - worked for an integral number of years in each of the three companies - RIL, TCS and ITC. The sums of the number of years spent in the three companies together were distinct for the four managers. The sums of the number of years spent by the four managers together in the RIL, TCS and ITC were 12, 13 and 14 respectively. No manager spent an equal number of years in any two companies. No two managers spent an equal number of years in any company.(Note: Each manager worked for atleast one year in each company). It is also known that:

- (i) Among the three companies, Renuka Ramnath spent the least time in TCS and the maximum in ITC.
- (ii) The number of years spent by Daljeet Singh and Rajat Gupta in ITC were 4 and 2 respectively.
- (iii) The sum of the number of years spent in the three companies together by Rajat Gupta was not less than that of Daljeet Singh.
- (iv) The sum of the number of years spent in the three companies together by Prakash Tandon was 16.
- (v) The absolute difference between the number of years spent by Daljeet Singh in RIL and the number of years spent by Rajat Gupta in TCS was 2.

Q.58

Find the sum of the number of years spent in the three companies together by Rajat Gupta.

1 8

2 9

3 10

4 None of these

Solution:**Correct Answer : 3** **Bookmark** **Answer key/Solution**

As no manager spent an equal number of years in any two companies, each manager must have spent at least 6 years ($1 + 2 + 3$) in the three companies together.

The total number of years spent by the four managers in the three companies = $12 + 13 + 14 = 39$. From statement (iv), Prakash Tandon spent 16 years in the three companies together, therefore, the total number of years spent by the other three managers was $39 - 16 = 23$.

From statement (ii), Daljeet Singh must have spent at least 7 years in the three companies together as he had spent 4 years in ITC alone. From statement (iii), the total number of years spent by Rajat Gupta in the three companies together was not less than that of Daljeet Singh. The only possibility is that Daljeet Singh spent 7 years, and Rajat Gupta and Renuka Ramnath spent 10 years and 6 years respectively.

Using statements (i), (v) and (ii) in that order along with the conclusions drawn above, the final distribution can be tabulated as given below.

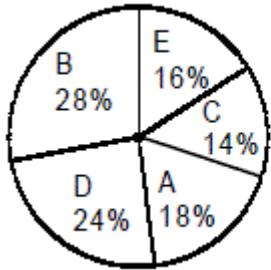
Manager	Company			Total
	RIL	TCS	ITC	
Daljeet Singh	1	2	4	7
Prakash Tandon	4	7	5	16
Rajat Gupta	5	3	2	10
Renuka Ramnath	2	1	3	6
Total	12	13	14	39

Required sum = $5 + 3 + 2 = 10$.


FeedBack

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

Five persons - A, B, C, D and E - invest in a start-up business venture. The percentage of capital invested by each person is represented in the pie chart below. The duration for which each one invests is given in the table.



Person	Time (in months)
A	8
B	x
C	$x + 4$
D	$x + 2$
E	$x - 2$

At the end of the year their venture earns a big profit. They plan to have a picnic to celebrate the success of their venture after receiving their shares in the profit. Two of them buy drinks, three of them pay for the food, three for travel and three of them spend on entertainment. Two of them pay for travel along with spending on food and entertainment. B receives Rs.2.8 lakh as his share in the profit. The one whose share is less than A's share spends only on food. All those persons whose share in the profit is more than C's share, spend on food. Of the two persons whose share in the profit is less than B but more than E, only one person spends on entertainment and drinks, whereas the other one spends on nothing else but travel. A, who receives Rs. 1.8 lakh as his share in the profit, spends on entertainment. D does not spend on drinks.

Q.59

Which of the following groups of friends pays for the travel?

- 1 D, C, A
- 2 A, B, D
- 3 B, C, D
- 4 A, C, E

Solution:**Correct Answer : 3** **Bookmark** **Answer key/Solution**

Let the total amount invested be Rs. k.
A's share in the profit is Rs. 1.8 lakh

$$\therefore \frac{18}{100}k \times 8 = 1.8 \times 10^5 \Rightarrow k = \frac{10^6}{8}$$

Now B's share in the profit = Rs. 2.8 lakh

$$\therefore \frac{28}{100}kx = 2.8 \times 10^5 \Rightarrow kx = 10^6$$

$$\Rightarrow x = \frac{10^6}{10^6} \times 8 \Rightarrow x = 8.$$

In this way, the shares of A, B, C, D and E are Rs. 1.8 lakh, Rs. 2.8 lakh, Rs. 2.1 lakh, Rs. 3 lakh and Rs. 1.2 lakh respectively.
Now, according to the given conditions, the final table will be as follows:

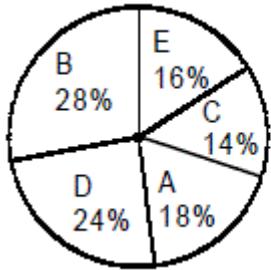
Person	Profit share (in Rs. lakh)	Spends on entertainment	Spends on food	Spends on travel	Spends on drinks
A	1.8	yes	no	no	yes
B	2.8	yes	yes	yes	yes
C	2.1	no	no	yes	no
D	3.0	yes	yes	yes	no
E	1.2	no	yes	no	no

Clearly, B, C and D group pays for the travel.


FeedBack

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

Five persons - A, B, C, D and E - invest in a start-up business venture. The percentage of capital invested by each person is represented in the pie chart below. The duration for which each one invests is given in the table.



Person	Time (in months)
A	8
B	x
C	$x + 4$
D	$x + 2$
E	$x - 2$

At the end of the year their venture earns a big profit. They plan to have a picnic to celebrate the success of their venture after receiving their shares in the profit. Two of them buy drinks, three of them pay for the food, three for travel and three of them spend on entertainment. Two of them pay for travel along with spending on food and entertainment. B receives Rs.2.8 lakh as his share in the profit. The one whose share is less than A's share spends only on food. All those persons whose share in the profit is more than C's share, spend on food. Of the two persons whose share in the profit is less than B but more than E, only one person spends on entertainment and drinks, whereas the other one spends on nothing else but travel. A, who receives Rs. 1.8 lakh as his share in the profit, spends on entertainment. D does not spend on drinks.

Q.60

Who all spend for food, entertainment, drinks and travel?

1 Only B

2 Both B and D

3 Both A and B

4 Only D

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

Let the total amount invested be Rs. k.
A's share in the profit is Rs. 1.8 lakh

$$\therefore \frac{18}{100}k \times 8 = 1.8 \times 10^5 \Rightarrow k = \frac{10^6}{8}$$

Now B's share in the profit = Rs. 2.8 lakh

$$\therefore \frac{28}{100}kx = 2.8 \times 10^5 \Rightarrow kx = 10^6$$

$$\Rightarrow x = \frac{10^6}{10^6} \times 8 \Rightarrow x = 8.$$

In this way, the shares of A, B, C, D and E are Rs. 1.8 lakh, Rs. 2.8 lakh, Rs. 2.1 lakh, Rs. 3 lakh and Rs. 1.2 lakh respectively.
Now, according to the given conditions, the final table will be as follows:

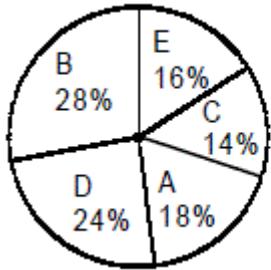
Person	Profit share (in Rs. lakh)	Spends on entertainment	Spends on food	Spends on travel	Spends on drinks
A	1.8	yes	no	no	yes
B	2.8	yes	yes	yes	yes
C	2.1	no	no	yes	no
D	3.0	yes	yes	yes	no
E	1.2	no	yes	no	no

Clearly only B is the one who pays for entertainment, food, travel and drinks.

FeedBack

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

Five persons - A, B, C, D and E - invest in a start-up business venture. The percentage of capital invested by each person is represented in the pie chart below. The duration for which each one invests is given in the table.



Person	Time (in months)
A	8
B	x
C	$x + 4$
D	$x + 2$
E	$x - 2$

At the end of the year their venture earns a big profit. They plan to have a picnic to celebrate the success of their venture after receiving their shares in the profit. Two of them buy drinks, three of them pay for the food, three for travel and three of them spend on entertainment. Two of them pay for travel along with spending on food and entertainment. B receives Rs.2.8 lakh as his share in the profit. The one whose share is less than A's share spends only on food. All those persons whose share in the profit is more than C's share, spend on food. Of the two persons whose share in the profit is less than B but more than E, only one person spends on entertainment and drinks, whereas the other one spends on nothing else but travel. A, who receives Rs. 1.8 lakh as his share in the profit, spends on entertainment. D does not spend on drinks.

Q.61

What is the average of the shares in profit of those who received more than Rs.2 lakh?

- 1 Rs. 2.3 lakh
- 2 Rs. 2.63 lakh
- 3 Rs. 3.12 lakh
- 4 None of these

Solution:**Correct Answer : 2** **Bookmark** **Answer key/Solution**

Let the total amount invested be Rs. k.
A's share in the profit is Rs. 1.8 lakh

$$\therefore \frac{18}{100}k \times 8 = 1.8 \times 10^5 \Rightarrow k = \frac{10^6}{8}$$

Now B's share in the profit = Rs. 2.8 lakh

$$\therefore \frac{28}{100}kx = 2.8 \times 10^5 \Rightarrow kx = 10^6$$

$$\Rightarrow x = \frac{10^6}{10^6} \times 8 \Rightarrow x = 8.$$

In this way, the shares of A, B, C, D and E are Rs. 1.8 lakh, Rs. 2.8 lakh, Rs. 2.1 lakh, Rs. 3 lakh and Rs. 1.2 lakh respectively.
Now, according to the given conditions, the final table will be as follows:

Person	Profit share (in Rs. lakh)	Spends on entertainment	Spends on food	Spends on travel	Spends on drinks
A	1.8	yes	no	no	yes
B	2.8	yes	yes	yes	yes
C	2.1	no	no	yes	no
D	3.0	yes	yes	yes	no
E	1.2	no	yes	no	no

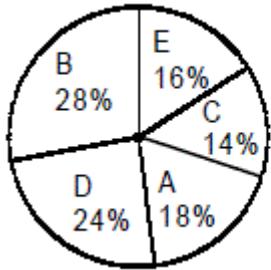
B, C and D receive more than Rs. 2 lakh.

$$\therefore \text{Required average} = \frac{2.8 + 2.1 + 3.0}{3} = \text{Rs. } 2.63 \text{ lakh.}$$

FeedBack

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

Five persons - A, B, C, D and E - invest in a start-up business venture. The percentage of capital invested by each person is represented in the pie chart below. The duration for which each one invests is given in the table.



Person	Time (in months)
A	8
B	x
C	$x + 4$
D	$x + 2$
E	$x - 2$

At the end of the year their venture earns a big profit. They plan to have a picnic to celebrate the success of their venture after receiving their shares in the profit. Two of them buy drinks, three of them pay for the food, three for travel and three of them spend on entertainment. Two of them pay for travel along with spending on food and entertainment. B receives Rs.2.8 lakh as his share in the profit. The one whose share is less than A's share spends only on food. All those persons whose share in the profit is more than C's share, spend on food. Of the two persons whose share in the profit is less than B but more than E, only one person spends on entertainment and drinks, whereas the other one spends on nothing else but travel. A, who receives Rs. 1.8 lakh as his share in the profit, spends on entertainment. D does not spend on drinks.

Q.62

If the total amount spent on travel is $\frac{7}{20}$ of A's share in the profit, then what percentage of C's share in the profit does he spend on travel expenses (assume those who spend on travel contributes equally on travel)?

Solution:
Correct Answer : 10

 **Bookmark**
 **Answer key/Solution**

Let the total amount invested be Rs. k.
A's share in the profit is Rs. 1.8 lakh

$$\therefore \frac{18}{100}k \times 8 = 1.8 \times 10^5 \Rightarrow k = \frac{10^6}{8}$$

Now B's share in the profit = Rs. 2.8 lakh

$$\therefore \frac{28}{100}kx = 2.8 \times 10^5 \Rightarrow kx = 10^6$$

$$\Rightarrow x = \frac{10^6}{10^6} \times 8 \Rightarrow x = 8.$$

In this way, the shares of A, B, C, D and E are Rs. 1.8 lakh, Rs. 2.8 lakh, Rs. 2.1 lakh, Rs. 3 lakh and Rs. 1.2 lakh respectively.
Now, according to the given conditions, the final table will be as follows:

Person	Profit share (in Rs. lakh)	Spends on entertainment	Spends on food	Spends on travel	Spends on drinks
A	1.8	yes	no	no	yes
B	2.8	yes	yes	yes	yes
C	2.1	no	no	yes	no
D	3.0	yes	yes	yes	no
E	1.2	no	yes	no	no

A's share in the profit = Rs.1.8 lakh

$$\text{Total amount spent on travel} = \frac{7}{20} \text{ of } 180000 = \text{Rs. } 63,000$$

C's share in the travel = Rs.21,000

$$\therefore \text{Required percentage} = \frac{21000}{210000} \times 100 = 10\%.$$

 **FeedBack**

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

A group of four friends - Umrao, Umang, Umesh, and Usha - working in a company, belongs to one of the following categories-Truth-tellers (who always speaks the truth), Liars (who always lies) and the Alternators (who alternates among truth and lie, in any order). It is also known that their professions are one among Finance Department, Sales department, Marketing department and Graphic Design (GD) department, in any order. No two friends work in the same department.

They made the following statements when they were asked about their departments they work in:

Umrao: I am a truth-teller. I work in the Finance Department. Umang works in the Marketing department.

Usha: I am an alternator. I work in GD department. Umrao is a liar.

Umesh: I am a truth-teller. I am in the Sales department. The one who works in GD department is an alternator.

Umang: I am a truth-teller. I work in the GD department. Usha is in the Sales department.

Q.63

If Umang is in the Finance department, then who is in the Marketing department?

1 Umrao

2 Umesh

3 Usha

4 Either (1) or (2)

Solution:

Correct Answer : 3

 **Bookmark**

 **Answer key/Solution**

Let's start by taking all possibilities for Umrao.

Case 1: When Umrao is truth-teller.

As Umrao is truth-teller, she must work in Finance department and Uman in Marketing department. That means first two statements of Uman are false which implies he must be a liar.

So, Usha must not be in sales department and hence, Umesh must be in the Sales department, which means first two statements of Umesh are false and hence he is a liar. Also, that means last two statements of Usha are alternate which contradict with her first statement as both 1st and 2nd statements can't be true together. So, this case is not possible.

Case 2: When Umrao is liar.

As Umrao is liar, she must not work in Finance department. Also, Uman must not work in Marketing department.

Subcase (i): Now, if Uman is truth-teller, the only possibility is:

Name	Department	Habit
Uman	Graphics	truth-teller
Usha	Sales	alternator
Umrao	Marketing	liar
Umesh	Finance	liar

Subcase (ii): When Uman is liar, there are following two possibilities:

I			II	
Name	Department	Habit	Department	Habit
Uman	Finance	liar	Finance	liar
Usha	Marketing	alternator	Marketing	alternator
Umrao	Graphics	liar	Sales	liar
Umesh	Sales	alternator	Graphics	liar

Subcase (iii): When Uman is alternator, the only possibility is

Name	Department	Habit
Uman	Graphics	alternator
Usha	Finance	alternator
Umrao	Marketing	liar
Umesh	Sales	truth-teller

Case 3: When Umrao is liar.

The following two cases are possible:

I			II	
Name	Department	Habit	Department	Habit
Uman	Sales	liar	Graphics	alternator
Usha	Marketing	liar	Marketing	liar
Umrao	Finance	alternator	Finance	alternator
Umesh	Graphics	liar	Sales	truth-teller

If Uman is in Finance, then Usha is in Marketing department in both the cases.

Feedback

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

A group of four friends - Umrao, Umang, Umesh, and Usha - working in a company, belongs to one of the following categories-Truth-tellers (who always speaks the truth), Liars (who always lies) and the Alternators (who alternates among truth and lie, in any order). It is also known that their professions are one among Finance Department, Sales department, Marketing department and Graphic Design (GD) department, in any order. No two friends work in the same department.

They made the following statements when they were asked about their departments they work in:

Umrao: I am a truth-teller. I work in the Finance Department. Umang works in the Marketing department.

Usha: I am an alternator. I work in GD department. Umrao is a liar.

Umesh: I am a truth-teller. I am in the Sales department. The one who works in GD department is an alternator.

Umang: I am a truth-teller. I work in the GD department. Usha is in the Sales department.

Q.64

If Umesh is an alternator, then the one who works in the Finance department is a/an

1 Liar

2 Truth-teller

3 Alternator

4 Either (1) or (2)

Solution:

Correct Answer : 1

 **Bookmark**

 **Answer key/Solution**

Let's start by taking all possibilities for Umrao.

Case 1: When Umrao is truth-teller.

As Umrao is truth-teller, she must work in Finance department and Umang in Marketing department. That means first two statements of Umang are false which implies he must be a liar.

So, Usha must not be in sales department and hence, Umesh must be in the Sales department, which means first two statements of Umesh are false and hence he is a liar. Also, that means last two statements of Usha are alternate which contradict with her first statement as both 1st and 2nd statements can't be true together. So, this case is not possible.

Case 2: When Umrao is liar.

As Umrao is liar, she must not work in Finance department. Also, Umang must not work in Marketing department.

Subcase (i): Now, if Umang is truth-teller, the only possibility is:

Name	Department	Habit
Umang	Graphics	truth-teller
Usha	Sales	alternator
Umrao	Marketing	liar
Umesh	Finance	liar

Subcase (ii): When Umang is liar, there are following two possibilities:

Name	Department	Habit	II	
			Department	Habit
Umang	Finance	liar	Finance	liar
Usha	Marketing	alternator	Marketing	alternator
Umrao	Graphics	liar	Sales	liar
Umesh	Sales	alternator	Graphics	liar

Subcase (iii): When Umang is alternator, the only possibility is

Name	Department	Habit
Umang	Graphics	alternator
Usha	Finance	alternator
Umrao	Marketing	liar
Umesh	Sales	truth-teller

Case 3: When Umrao is liar.

The following two cases are possible:

Name	Department	Habit	II	
			Department	Habit
Umang	Sales	liar	Graphics	alternator
Usha	Marketing	liar	Marketing	liar
Umrao	Finance	alternator	Finance	alternator
Umesh	Graphics	liar	Sales	truth-teller

If Umesh is an alternator, then Umang who is in Finance is a liar.

FeedBack

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

A group of four friends - Umrao, Umang, Umesh, and Usha - working in a company, belongs to one of the following categories-Truth-tellers (who always speaks the truth), Liars (who always lies) and the Alternators (who alternates among truth and lie, in any order). It is also known that their professions are one among Finance Department, Sales department, Marketing department and Graphic Design (GD) department, in any order. No two friends work in the same department.

They made the following statements when they were asked about their departments they work in:

Umrao: I am a truth-teller. I work in the Finance Department. Umang works in the Marketing department.

Usha: I am an alternator. I work in GD department. Umrao is a liar.

Umesh: I am a truth-teller. I am in the Sales department. The one who works in GD department is an alternator.

Umang: I am a truth-teller. I work in the GD department. Usha is in the Sales department.

Q.65

If there is only one liar and he is not Umrao, then who works in Sales department?

1 Usha

2 Umrao

3 Umesh

4 Cannot be determined

Solution:

Correct Answer : 3

 **Bookmark**

 **Answer key/Solution**

Let's start by taking all possibilities for Umrao.

Case 1: When Umrao is truth-teller.

As Umrao is truth-teller, she must work in Finance department and Umang in Marketing department. That means first two statements of Umang are false which implies he must be a liar.

So, Usha must not be in sales department and hence, Umesh must be in the Sales department, which means first two statements of Umesh are false and hence he is a liar. Also, that means last two statements of Usha are alternate which contradict with her first statement as both 1st and 2nd statements can't be true together. So, this case is not possible.

Case 2: When Umrao is liar.

As Umrao is liar, she must not work in Finance department. Also, Umang must not work in Marketing department.

Subcase (i): Now, if Umang is truth-teller, the only possibility is:

Name	Department	Habit
Umang	Graphics	truth-teller
Usha	Sales	alternator
Umrao	Marketing	liar
Umesh	Finance	liar

Subcase (ii): When Umang is liar, there are following two possibilities:

Name	Department	Habit	II	
			Department	Habit
Umang	Finance	liar	Finance	liar
Usha	Marketing	alternator	Marketing	alternator
Umrao	Graphics	liar	Sales	liar
Umesh	Sales	alternator	Graphics	liar

Subcase (iii): When Umang is alternator, the only possibility is

Name	Department	Habit
Umang	Graphics	alternator
Usha	Finance	alternator
Umrao	Marketing	liar
Umesh	Sales	truth-teller

Case 3: When Umrao is liar.

The following two cases are possible:

Name	Department	Habit	II	
			Department	Habit
Umang	Sales	liar	Graphics	alternator
Usha	Marketing	liar	Marketing	liar
Umrao	Finance	alternator	Finance	alternator
Umesh	Graphics	liar	Sales	truth-teller

As can be seen in above tables, possibility II of case 3 is the scenario. So, Umesh works in Sales.

FeedBack

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

A group of four friends - Umrao, Umang, Umesh, and Usha - working in a company, belongs to one of the following categories-Truth-tellers (who always speaks the truth), Liars (who always lies) and the Alternators (who alternates among truth and lie, in any order). It is also known that their professions are one among Finance Department, Sales department, Marketing department and Graphic Design (GD) department, in any order. No two friends work in the same department.

They made the following statements when they were asked about their departments they work in:

Umrao: I am a truth-teller. I work in the Finance Department. Umang works in the Marketing department.

Usha: I am an alternator. I work in GD department. Umrao is a liar.

Umesh: I am a truth-teller. I am in the Sales department. The one who works in GD department is an alternator.

Umang: I am a truth-teller. I work in the GD department. Usha is in the Sales department.

Q.66

From which of the given conditions, we will get a complete idea about them?

- I. There are exactly two liars.
- II. There are exactly two alternators.
- III. There is no truth-teller.

1 Only I

2 Only II

3 Any two of the above three

4 Only III

Solution:

Correct Answer : 3

 **Bookmark**

 **Answer key/Solution**

Let's start by taking all possibilities for Umrao.

Case 1: When Umrao is truth-teller.

As Umrao is truth-teller, she must work in Finance department and Umang in Marketing department. That means first two statements of Umang are false which implies he must be a liar.

So, Usha must not be in sales department and hence, Umesh must be in the Sales department, which means first two statements of Umesh are false and hence he is a liar. Also, that means last two statements of Usha are alternate which contradict with her first statement as both 1st and 2nd statements can't be true together. So, this case is not possible.

Case 2: When Umrao is liar.

As Umrao is liar, she must not work in Finance department. Also, Umang must not work in Marketing department.

Subcase (i): Now, if Umang is truth-teller, the only possibility is:

Name	Department	Habit
Umang	Graphics	truth-teller
Usha	Sales	alternator
Umrao	Marketing	liar
Umesh	Finance	liar

Subcase (ii): When Umang is liar, there are following two possibilities:

I			II	
Name	Department	Habit	Department	Habit
Umang	Finance	liar	Finance	liar
Usha	Marketing	alternator	Marketing	alternator
Umrao	Graphics	liar	Sales	liar
Umesh	Sales	alternator	Graphics	liar

Subcase (iii): When Umang is alternator, the only possibility is

Name	Department	Habit
Umang	Graphics	alternator
Usha	Finance	alternator
Umrao	Marketing	liar
Umesh	Sales	truth-teller

Case 3: When Umrao is liar.

The following two cases are possible:

I			II	
Name	Department	Habit	Department	Habit
Umang	Sales	liar	Graphics	alternator
Usha	Marketing	liar	Marketing	liar
Umrao	Finance	alternator	Finance	alternator
Umesh	Graphics	liar	Sales	truth-teller

Using any two statements of the given three, a fixed scenario can be found.

FeedBack

Sec 3

Q.67

A, B and C can make 486 toys together in 9 days. In a day, C can make as many more toys than B as B can make more than A. C's 4 days of work is equivalent to A's 5 days of work. How many toys can A alone make in a day?

Solution:

Correct Answer : 16

$$\text{Number of toys all three of them can make in a day} = \frac{486}{9} = 54$$

On an average, $\frac{54}{3} = 18$ toys will be made by each.

Let C can make x number of toys more than B.

Then, A = 18 - x, B = 18 and C = 18 + x

Therefore, $4(18 + x) = 5(18 - x)$

$$\Rightarrow x = 2$$

Hence, A can make in a day = $18 - 2 = 16$ toys.

Bookmark

Answer key/Solution

FeedBack

Q.68

A number has six factors, out of which, three are even. If the sum of all its odd factors is 57 less than the sum of all its even factors, then what is the sum of all six factors?

1 **160**

2 **171**

3 **185**

4 **200**

Solution:

Correct Answer : 2

Bookmark

Answer key/Solution

A number with 3 even factors and 3 odd factors must be of the form $2^1(x)^2$, where x is odd as well as prime.

Sum of the odd factors = $x^0 + x^1 + x^2$

Sum of the even factors = $2(x^0 + x^1 + x^2)$

Now, if sum of odd factors = S (say), then clearly sum of even factors = 2S and total sum (of all factors) = 3S

Given that, $2S - S = 57$

$$\Rightarrow S = 57$$

Hence, the required answer = $3 \times 57 = 171$.

FeedBack

Q.69

If $S_1, S_2, S_3, \dots, S_r$ are the sums of the first n terms of ' r ' different Arithmetic Progressions whose first terms are 1, 2, 3, ..., r respectively and whose common differences are 1, 3, 5, ..., $(2r - 1)$ respectively, then the value of $S_1 + S_2 + S_3 + \dots + S_r$ is

1 $\frac{(nr - 1)(nr + 1)}{2}$

2 $\frac{(nr + 1)nr}{2}$

3 $\frac{(nr - 1)nr}{2}$

4 $\frac{n(nr + 1)}{2}$

Solution:

Correct Answer : 2



[Answer key/Solution](#)

$$S_1 + S_2 + \dots + S_r \\ = \frac{n}{2} [(2 + 4 + \dots + 2r) + (n - 1)(1 + 3 + 5 + \dots + (2r - 1))]$$

$$= n(1 + 2 + \dots + r) + \frac{n^2}{2} [1 + 3 + 5 + \dots + (2r - 1)] - \frac{n}{2}(1 + 3 + 5 + \dots + (2r - 1))$$

$$= \frac{r \cdot (r + 1)}{2} \cdot n + \frac{n^2 r^2}{2} - \frac{nr^2}{2} = \frac{nr(1 + nr)}{2}.$$

[FeedBack](#)

Q.70

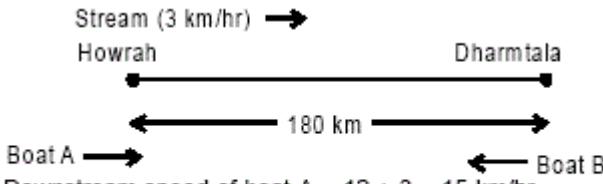
The journey from Howrah to Dharmatala is a downstream journey of 180 km on a stream which flows at a speed of 3 km/hr. Boats A and B, running between these two cities starting from Howrah and Dharmatala respectively, have speeds of 12 km/hr and 15 km/hr respectively in still water. After how many hours after starting their journey will two boats meet for the second time?

1 40/3

2 46/3

3 49/3

4 62/3

Solution:**Correct Answer : 4****Bookmark****Answer key/Solution**Downstream speed of boat A = $12 + 3 = 15 \text{ km/hr}$ Downstream speed of boat B = $15 - 3 = 12 \text{ km/hr}$

Their first meeting will take place after 6.66 hours after starting the journey.

After 12 hours from the starting, boat A will be at Dharmatala and boat B will be at 144 km far from Dharmatala and will take 3 hours more to reach Howrah.

In these 3 hours, boat A will cover = $(12 - 3) \times 3 = 27 \text{ km}$.∴ Now, distance between boats A and B = $180 - 27 = 153 \text{ km}$.

$$\text{Now, time taken in meeting} = \frac{153}{18+9} = \frac{153}{27} = \frac{17}{3} \text{ hours.}$$

∴ The two boats will meet for the second time after $12 + 3 + \frac{17}{3} = \frac{62}{3}$ hours after starting their journey.**FeedBack****Q.71**

A man purchased petrol from three petrol pumps A, B and C in the ratio of 3 : 2 : 1. Petrol purchased from pump A, B and C had 10%, 20% and 30% water respectively. How much percentage extra amount was paid by the person if it is known that water was freely available?

Solution:**Correct Answer : 20****Bookmark****Answer key/Solution**Let petrol purchased from pumps A, B and C be $3x$, $2x$ and x litres.

$$\text{Total water in petrol bought} = \frac{3x}{10} + 2x \times \frac{20}{100} + x \times \frac{30}{100} = \frac{3x}{10} + \frac{4x}{10} + \frac{3x}{10} = \frac{10x}{10} = x$$

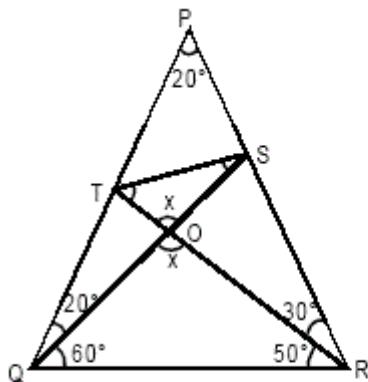
Extra amount was paid for x litre.

$$\text{Required percentage} = \frac{x}{6x-x} \times 100 = 20\%.$$

FeedBack**Q.72**

In $\triangle PQR$, $\overline{PQ} = \overline{PR}$ and $\angle QPR = 20^\circ$. S is a point on PR such that $\angle SQR = 60^\circ$ and T is a point on PQ such that $\angle TRQ = 50^\circ$. Find the measure of $\angle STR + \angle TSQ$.

1 **60°**

2 **70°**3 **110°**4 **90°****Solution:****Correct Answer : 3** **Bookmark** **Answer key/Solution**

In $\triangle OQR$, $\angle QOR = x^\circ$ (let), then $x^\circ = 180^\circ - (60 + 50^\circ) = 70^\circ$

Then in $\triangle OTS$, $\angle TOS = x^\circ$ (vertically opposite angles)

Also, in $\triangle OTS$,

$$\angle OTS + \angle OST + \angle TOS = 180^\circ$$

$$\Rightarrow \angle STR + \angle TSQ + 70^\circ = 180^\circ$$

$$\Rightarrow \angle STR + \angle TSQ = 110^\circ.$$

[FeedBack](#)
Q.73

A case study competition was launched by a company in IIML, which has 110 students. A specific number of students opted finance case study. The strategy case study was chosen by one third of the number of students who chose finance case study. What will be the maximum value of the number of students who chose both finance and strategy case studies? (Note: each value is a multiple of 5.)

Solution:**Correct Answer : 30**

Let the number of students who chose strategy be x .

So, the number of students who chose finance = $3x$

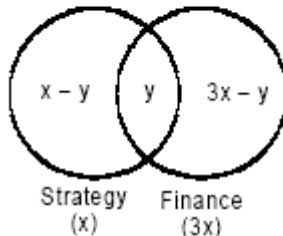
Let the number of students who chose both be y .

$$\text{So, } 4x - y = 110 \quad \dots \text{(i)}$$

\therefore Number of students who chose strategy cannot be negative.

$$\text{So, } x - y \geq 0$$

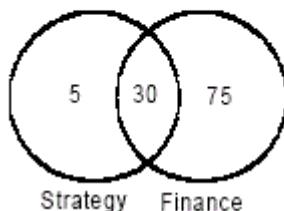
$$\therefore x \geq y \quad \dots \text{(ii)}$$



Putting 'x' as multiples of 5 in equation (i) beginning from $x = 30$,

we get different values of y .

The maximum value of y which also satisfies equation (ii) is 30 when $x = 35$.



FeedBack

Bookmark

Answer key/Solution

Q.74

Due to some discount available on a product, a customer was able to buy 25% more products spending the same amount. Had there been the discount of additional 40 percentage points, then he would have been able to purchase

- 1 **100% more products than the case when no discount was given.**
- 2 **25% more products than the case when 50% discount was given.**
- 3 **250% more products than the case when no discount was given.**
- 4 **None of these.**

Solution:**Correct Answer : 2**
 **Bookmark**
 **Answer key/Solution**

Since the amount spent is constant, we can take it to be 1.

Amount spent = Price × Quantity

$$1 = 1 \times 1 \quad (\text{No discount})$$

$$1 = \frac{4}{5} \times \frac{5}{4} \quad (25\% \text{ more purchase at } 20\% \text{ discount,})$$

$$1 = \frac{2}{5} \times \frac{5}{2} \quad (\text{Additional } 40\% \text{ discount} = 20 + 40 = 60\% \text{ discount purchase is } 250\% \text{ of that if there was no discount})$$

$$1 = \frac{1}{2} \times 2 \quad (\text{If } 50\% \text{ discount was given, purchase is } 200\% \text{ of that if there was no discount})$$

We can see that option (2) is correct as $\frac{\frac{5}{2} - 2}{2} \times 100 = 25\%$

 **FeedBack**
Q.75

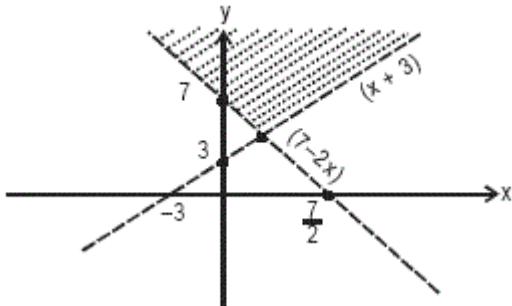
If $f(x) = \max (7 - 2x, x + 3)$; then the minimum value of $f(x)$ is

1 **4/3**

2 **8/3**

3 **3**

4 **13/3**

Solution:**Correct Answer : 4****Bookmark****Answer key/Solution**

In the above graph, we can see that minimum value of $\max(7 - 2x, x + 3)$ is at the meeting point of $7 - 2x$ and $x + 3$.

$$\text{At this point; } 7 - 2x = x + 3 \Rightarrow x = \frac{4}{3}$$

$$\text{Value of the function at } x = \frac{4}{3} \text{ is } 7 - 2\left(\frac{4}{3}\right) = \frac{13}{3}.$$

FeedBack

Q.76

An alloy A, containing zinc and copper, is mixed with another alloy B, which contains copper and aluminium in the ratio of 2 : 1. What could be the ratio of zinc and copper in the alloy A if the final mixture has zinc, copper and aluminium in the ratio of 2 : 5 : 2?

1 3 : 2

2 2 : 1

3 2 : 3

4 1 : 3

Solution:**Correct Answer : 2** **Bookmark** **Answer key/Solution**

Let the quantity of zinc and copper in alloy A be p and q respectively.

In alloy B, let quantity of copper and aluminium be 2y and y respectively.

Let the quantity of zinc, copper and aluminium in the final mixture be 2x, 5x and 2x respectively

$$\therefore q + 2y = 5x \quad \dots (i)$$

$$p = 2x$$

$$y = 2x$$

Putting above value of y in equation (i), we get

$$q + 2(2x) = 5x$$

$$\Rightarrow q = x$$

$$\therefore \frac{p}{q} = \frac{2x}{x} = 2:1.$$

FeedBack**Q.77**

The graphs of the equations: $x - y = 2$ and $kx + y = 3$, where k is a constant, intersect each other at a point (x, y) in the first quadrant, if and only if, k is

1 equal to -12 greater than -13 less than 3/24 lying between -1 and 3/2**Solution:****Correct Answer : 4**

$$x - y = 2$$

$$kx + y = 3$$

$$\Rightarrow x = \frac{5}{1+k}, y = \frac{3-2k}{1+k} \Rightarrow 1+k > 0 \text{ and } 3-2k > 0 \Rightarrow k > -1 \text{ and } k < \frac{3}{2}$$

Bookmark **Answer key/Solution****FeedBack****Q.78**

An inlet pipe can fill a tank in 6 hours and an outlet pipe can empty the tank in 50 hours. How many additional number of outlet pipes of the same capacity should be filled in the tank, so that the tank never over flows?

1 6

2 73 84 9**Solution:****Correct Answer : 3** **Bookmark** **Answer key/Solution**

Let total work be LCM (6, 50) = 150 units.

Efficiency of an inlet pipe = 25 units/hr.

Efficiency of an outlet pipe = 3 units/hr.

If there were total of 9 outlet pipes, then there cannot be overflow. It means additional 8 outlet pipes are needed.

 **FeedBack****Q.79**
 $\log_{10}(\log_2 3) + \log_{10}(\log_3 4) + \dots + \log_{10}(\log_{1023} 1024)$ equals
Solution:**Correct Answer : 1** **Bookmark** **Answer key/Solution**

$$\log_{10}(\log_2 3) + \log_{10}(\log_3 4) + \dots + \log_{10}(\log_{1023} 1024) \\ = \log_{10}[\log_2 3 \times \log_3 4 \times \log_4 5 \times \dots \times \log_{1023} 1024]$$

$$= \log_{10} \left[\frac{\log 3}{\log 2} \times \frac{\log 4}{\log 3} \times \frac{\log 5}{\log 4} \times \dots \times \frac{\log 1023}{\log 1022} \times \frac{\log 1024}{\log 1023} \right]$$

$$= \log_{10} \left[\frac{\log 1024}{\log 2} \right] = \log_{10} [\log_2 1024] = \log_{10} [\log_2 (2^{10})] = \log_{10} 10 = 1.$$

 **FeedBack****Q.80**

The length, breadth and height of a room are in a ratio of 6 : 3 : 2. If both length and breadth are reduced to 66.66% while the height is doubled then the total area of any two adjacent walls of the room will be

1 Increased by 11.11%2 Reduced by 33.33%3 Increased by 33.333%4 Reduced by 11.11%

Solution:**Correct Answer : 3**

Let the length, breadth and height of the room be $6x$, $3x$ and $2x$ respectively.
 So, area of any two adjacent walls = $(6x \times 2x) + (3x \times 2x) = 18x^2$.

$$\text{Now, new length becomes } = \frac{2}{3} \times 6x = 4x$$

$$\text{New breadth becomes } = \frac{2}{3} \times 3x = 2x$$

$$\text{New height becomes } = 2 \times 2x = 4x.$$

$$\therefore \text{New area of those two adjacent walls } = (4x \times 4x) + (2x \times 4x) = 16x^2 + 8x^2 = 24x^2.$$

$$\therefore \text{Percentage increase in area } = \frac{(24x^2 - 18x^2)}{18x^2} \times 100 = \frac{6x^2}{18x^2} \times 100 = 33.33\%.$$

 **Bookmark**
 **Answer key/Solution**
FeedBack
Q.81

If $\{x\}$ is the nearest integer to the square root of x , then find the value of the series;
 $\{1\} + \{2\} + \{3\} + \{4\} + \dots + \{97\} + \{98\} + \{99\} + \{100\}$

 1 **650**

 2 **660**

 3 **670**

 4 **690**

Solution:**Correct Answer : 3** **Bookmark** **Answer key/Solution**

We know that; $(1.5)^2 = 2.25$, $(2.5)^2 = 6.25$,
 $(3.5)^2 = 12.25$, $(4.5)^2 = 20.25$, $(5.5)^2 = 30.25$, $(6.5)^2 = 42.25$, $(7.5)^2 = 56.25$, $(8.5)^2 = 72.25$, $(9.5)^2 = 90.25$

So, we can conclude that;

$$\{1\} = 1, \{2\} = 1$$

$$\{3\} = 2, \{4\} = 2, \{5\} = 2, \{6\} = 2$$

$$\{7\} = 3, \{8\} = 3, \{9\} = 3, \{10\} = 3, \{11\} = 3, \{12\} = 3$$

$$\{13\} = \{14\} = \{15\} = \dots = \{18\} = \{19\} = \{20\} = 4$$

$$\{21\} = \{22\} = \{23\} = \dots = \{28\} = \{29\} = \{30\} = 5$$

$$\{31\} = \{32\} = \{33\} = \dots = \{40\} = \{41\} = \{42\} = 6$$

$$\{43\} = \{44\} = \{45\} = \dots = \{54\} = \{55\} = \{56\} = 7$$

$$\{57\} = \{58\} = \{59\} = \dots = \{70\} = \{71\} = \{72\} = 8$$

$$\{73\} = \{74\} = \{75\} = \dots = \{88\} = \{89\} = \{90\} = 9$$

$$\{91\} = \{92\} = \{93\} = \dots = \{98\} = \{99\} = \{100\} = 10$$

We can see that there are two terms which value is 1, four term have value of 2, six terms have value of 3,

Eight _____ 4, Ten _____ 5,

Twelve _____ 6, Fourteen _____ 7,

Sixteen _____ 8, Eighteen _____ 9

and ten terms have value of 10.

$$\therefore \text{Sum of the series} = (2 \times 1) + (4 \times 2) + (6 \times 3) + (8 \times 4) + (10 \times 5) + (12 \times 6) + (14 \times 7) + (16 \times 8) + (18 \times 9) + (10 \times 10) = 2 + 8 + 18 + 32 + 50 + 72 + 98 + 128 + 162 + 100 = 670.$$

FeedBack**Q.82**

A certain sum of money is invested at an interest rate of 5% per annum and a second sum, twice as large as the first, is invested at 5.5% per annum. The total amount of interest earned from the two investments together is Rs. 1,000 per year. The second sum (in Rs.) invested is

Solution:**Correct Answer : 12500** **Bookmark** **Answer key/Solution**

Let the first sum invested be Rs.x and second sum invested is Rs.2x.

$$\therefore \frac{x \times 5 \times 1}{100} + \frac{2x \times 5.5 \times 1}{100} = 1000 \Rightarrow \frac{5x}{100} + \frac{11x}{100} = 1000 \Rightarrow \frac{16x}{100} = 1000 \Rightarrow x = 100 \times 62.5 = \text{Rs. } 6,250$$

Hence, second sum invested will be Rs.12,500.

FeedBack

Q.83

If α and β are the roots of the quadratic equation: $x^2 - 6x - 2 = 0$, and $a_n = \alpha^n - \beta^n$, then the value of $\frac{a_{10} - 2a_8}{2a_9}$ is

Solution:**Correct Answer : 3****Bookmark****Answer key/Solution**

$$\frac{a_{10} - 2a_8}{2a_9} = \frac{\alpha^{10} - \beta^{10} - 2\alpha^8 + 2\beta^8}{2\alpha^9 - 2\beta^9} = \frac{\alpha^8(\alpha^2 - 2) - \beta^8(\beta^2 - 2)}{2(\alpha^9 - \beta^9)} = \frac{\alpha^8(6\alpha) - \beta^8(6\beta)}{2(\alpha^9 - \beta^9)} = \frac{6(\alpha^9 - \beta^9)}{2(\alpha^9 - \beta^9)} = 3.$$

FeedBack**Q.84**

A train leaves Delhi for Amritsar at 2 : 45 p.m. and goes at the rate of 50 km per hour. Another train leaves Amritsar for Delhi at 1 : 35 p.m. and goes at the rate of 60 km per hour. If the distance between Delhi and Amritsar is 510 km, at what distance (in km) from Delhi will the two trains meet?

Solution:**Correct Answer : 200**

Let the two trains meet at x km from Delhi.

$$\text{Then their meeting time} = 2 : 45 \text{ p.m.} + \frac{x}{50} = 1:35 \text{ p.m.} + \frac{510-x}{60}$$

$$\text{or, } (2.45 \text{ p.m.} - 1.35 \text{ p.m.}) + \left(\frac{x}{50} + \frac{x}{60} \right) = \frac{510}{60} = \frac{17}{2} \text{ hours}$$

$$\text{or, } \left[1\frac{1}{6} \text{ hr} \right] + x \left[\frac{50+60}{50 \times 60} \right] = \frac{17}{2} \text{ hours}$$

$$\text{or, } x \left[\frac{110}{3000} \right] = \frac{17}{2} - \frac{7}{6} = \frac{44}{6}$$

$$\therefore x = \frac{44}{6} \times \frac{3000}{110} = 200 \text{ km.}$$

Bookmark**Answer key/Solution****FeedBack****Q.85**

If a chord of length $\sqrt{10}$ cm subtends an angle of 90° at the centre of a circle, then find the length, in cm, of a chord that subtends an angle of 150° at the centre of the same circle.

1 $\sqrt{10 + 5\sqrt{3}}$

2 $\sqrt{10 - 5\sqrt{3}}$

3 $\sqrt{15}$

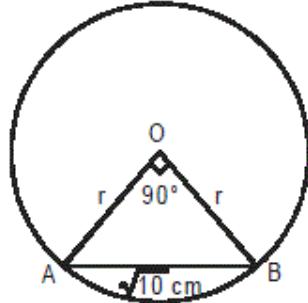
4 $\sqrt{5}$

Solution:

Correct Answer : 1

 **Bookmark**

 **Answer key/Solution**



The chord subtends an angle of 90° at the center so a right angled triangle will be formed with the other two sides being the radius of the circle.

Let r be the radius of the circle. Then,

$$r^2 + r^2 = 10 \Rightarrow r = \sqrt{5} \text{ cm}$$

Let the length of the chord that subtends 150° at the center be ' x ' cm.

Then, using Cosine rule,

$$x^2 = (\sqrt{5})^2 + (\sqrt{5})^2 - 2 \times \sqrt{5} \times \sqrt{5} \cos 150^\circ \Rightarrow x = \sqrt{10 + 5\sqrt{3}} \text{ cm.}$$

FeedBack

Q.86

The number of ordered triplets (x, y, z) such that x, y, z are primes satisfying $x^y + 1 = z$ is

1 0

2 1

3 2

4 infinitely many

Solution:**Correct Answer : 2** **Bookmark** **Answer key/Solution**

Since all the prime numbers except 2 are odd and greater than 2, therefore, z must be greater than 3.

$$x^y + 1 = \text{odd} \quad (\text{Since } z \text{ is odd})$$

$$\Rightarrow x \text{ is even i.e., } x = 2$$

Also, $2^{\text{odd}} + 1$ is always divisible by 3.

$$\therefore y = 2$$

Hence, the only possible solution is $x = y = 2$ and $z = 5$.

FeedBack**Q.87**

In how many ways can an amount of Rs.100 be paid using exactly 27 coins of denominations Re.1, Rs. 2 and Rs. 5 such that at least one coin of each denomination is used?

1 22 33 44 5**Solution:****Correct Answer : 2** **Bookmark** **Answer key/Solution**

Let the number of one rupee and two rupee coins used denoted by x and y respectively.

Therefore, the number of five rupee coins will be $27 - x - y$

$$x + 2y + 5(27 - x - y) = 100$$

$$\Rightarrow 4x + 3y = 35 \quad \dots \text{(i)}$$

This equation has only three solutions (Since $y \geq 1$)

i.e., (2, 9), (5, 5) and (8, 1)

Therefore, one can pay Rs. 100 using coins in the given denominations in exactly three ways.

FeedBack**Q.88**

For non-zero real numbers a, b and c, the set of possible values of the quantity $\frac{a}{|a|} + \frac{b}{|b|} + \frac{c}{|c|} + \frac{abc}{|abc|}$ is

1 {0}2 {-4, 0, 4}3 {-4, -2, 2, 4}4 {-4, -2, 0, 2, 4}**Solution:****Correct Answer : 2**

$$\text{Case 1: } \frac{a}{-a} + \frac{b}{-b} + \frac{c}{-c} + \frac{abc}{-abc} = -4$$

$$\text{Case 2: } \frac{a}{a} + \frac{b}{-b} + \frac{c}{-c} + \frac{abc}{abc} = 1 - 1 - 1 + 1 = 0$$

$$\text{Case 3: } \frac{a}{a} + \frac{b}{b} + \frac{c}{-c} + \frac{abc}{-abc} = 1 + 1 - 1 - 1 = 0$$

$$\text{Case 4: } \frac{a}{a} + \frac{b}{b} + \frac{c}{c} + \frac{abc}{abc} = 4$$

So, the possible set of values of the given quantity is {-4, 0, 4}.

Bookmark**Answer key/Solution****FeedBack****Q.89**

What will be the remainder on dividing $(4^{101} + 6^{101})$ by 25?

Solution:**Correct Answer : 10**

$$\text{rem} \left[\frac{4^{101} + 6^{101}}{25} \right]$$

$$= \text{rem} \left[\frac{4^{101}}{25} + \frac{6^{101}}{25} \right] = \text{rem} \left[\frac{4(1024)^{20}}{25} + \frac{6 \cdot (6^4)^{25}}{25} \right]$$

$$= 4 + \text{rem} \left[\frac{6 \times (1296)^{25}}{25} \right] = 4 + \text{rem} \left[\frac{6(-4)^{25}}{25} \right] = 4 + (6)(1) = 10.$$

Bookmark**Answer key/Solution****FeedBack****Q.90**

A tank having 10 inlet pipes, each filling the tank in 8 hours, and 6 outlet pipes, each emptying the tank in 6 hours, has all its pipes being opened simultaneously. Initially, the tank is empty. What is the time (in hours) after which the tank will be completely filled?

Solution:**Correct Answer : 4**

Let the capacity of tank be 24 litres (LCM of 8 and 6).
 So, an inlet pipe will fill 3 units/hour.
 And an outlet pipe will empty 4 units/hour
 10 inlet pipes will fill 30 units/hour
 6 outlet pipes will empty 24 units/hour
 So, total units filled in an hour = $30 - 24 = 6$ units
 Hence, 4 hours will be taken to fill the tank completely.

Bookmark **Answer key/Solution****FeedBack****Q.91**

If $(ab)^2 = bcb$ and $(ad)^2 = cde$; b, c and d are in Arithmetic Progression, then which of the following statements is true? (Note: ab and bcb are two and three digit numbers respectively.)

1 e is equal to 4 or 92 e is equal to 43 e is equal to 94 The sum of a and e is 9**Solution:****Correct Answer : 2** **Bookmark** **Answer key/Solution**

$$(ab)^2 = bcb$$

We can observe that unit digit of square of a two digit number having unit digit 0, 1, 5 are 6 is same as that of the number itself.

Here, b is the unit digit.

If b = 0; then bcb can't be a three digit number.

If b = 1; then only possibility is $(11)^2 = 121$

\therefore b, c and d are in A.P.

$$\therefore d = 2 + 1 = 3$$

$$(ad)^2 = (13)^2 = 169$$

In this case c = 1, d = 6, e = 9, a = 1, b = 1, c = 2

$$\therefore c = 1 \text{ and } c = 2$$

\therefore This case is not possible.

If b = 5; then $(ab)^2 = bcb$ is not possible for any number.

If b = 6; only possibility is $(26)^2 = 676$

$$a = 2, b = 6, c = 7$$

$$\therefore d = 7 + 1 = 8$$

$$(ad)^2 = cde$$

$$\Rightarrow (28)^2 = 784$$

$$e = 4.$$

FeedBack

Q.92

If the number of diagonals of a convex polygon is 50% more than the number of its sides, then find the sum of all the interior angles (in degrees) of the polygon.

1 90

2 180

3 360

4 720

Solution:

Correct Answer : 4

Number of diagonals of a polygon of n sides = ${}^nC_2 - n$

$$\text{Now, } {}^nC_2 - n = \frac{3}{2}n$$

$$\Rightarrow \frac{n(n-1)}{2} = \frac{3}{2}n + n \Rightarrow n^2 - n = 5n \Rightarrow n(n-6) = 0$$

Since $n \neq 0$, so $n = 6$

Therefore, sum of all the interior angles of a hexagon = $(6 - 2)180^\circ = 720^\circ$.

 **Bookmark**

 **Answer key/Solution**

FeedBack

Q.93

A race was conducted between three people, A, B and C. A finished the race by running at a speed thrice as fast as B. B ran at a speed equal to one fifth of the speed of C. If C beat A by 50 seconds and the race track length is 1000 metres, then what was the time taken (in seconds) by B to complete the race?

Solution:

Correct Answer : 375

Let the speeds of A, B and C be a , b and c m/sec respectively.

$$a = 3b \text{ and } b = \frac{c}{5}$$

$$\frac{1000}{a} - \frac{1000}{c} = 50$$

$$\frac{1000}{3b} - \frac{1000}{5b} = 50 \Rightarrow \frac{2000}{15b} = 50 \Rightarrow b = \frac{8}{3} \text{ m/sec.}$$

 **Bookmark**

 **Answer key/Solution**

So, the time taken by B is $\frac{1000}{\left(\frac{8}{3}\right)}$ that is 375 seconds.

FeedBack

Q.94

If the value of a quadratic polynomial 'p(x)' is 0 only at $x = -1$ and $p(-2) = 2$, then the value of $p(2)$ is

Solution:

Correct Answer : 18

$$\begin{aligned} P(x) &= k(x + 1)^2 \\ P(-2) &= k(-1)^2 = 2 \\ \Rightarrow k &= 2 \\ \therefore P(2) &= 2(2 + 1)^2 = 18. \end{aligned}$$

FeedBack

Bookmark

Answer key/Solution

Q.95

Amita bought some apples at the rate of 5 per rupee. She bought the same number of apples at the rate of 4 per rupee. She mixes both the types and sells at 9 for rupees 2. In this business, she bears a loss of Rs. 3. Find out how many apples she bought in all.

Solution:

Correct Answer : 1080

Suppose she bought 'x' apples of each quality

$$\text{Then her total investment} = \frac{x}{5} + \frac{x}{4} = \text{Rs. } \frac{9x}{20}$$

$$\text{Total selling price} = \text{Rs. } \frac{2x \times 2}{9} = \text{Rs. } \frac{4x}{9}$$

$$\therefore \text{Total loss} = \frac{9x}{20} - \frac{4x}{9} = \frac{81x - 80x}{180} = \frac{x}{180}$$

$$\text{Then, } \frac{x}{180} = \text{Rs. } 3 \Rightarrow x = 180 \times 3 = 540.$$

Therefore, total purchased apples = $540 \times 2 = 1080$.

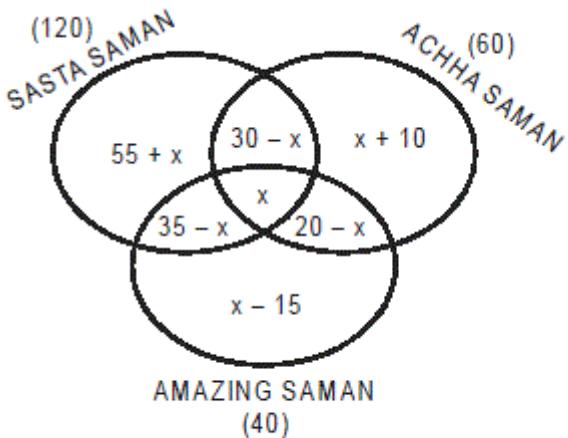
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Answer key/Solution

Q.96

During Mahabachat offer, one hundred fifty five students placed order through three shopping APPs. viz. SASTA SAMAN, ACHHA SAMAN and AMAZING SAMAN. 120 students ordered through SASTA SAMAN, 60 through ACHHA SAMAN and 40 through AMAZING SAMAN. 30 students placed orders through both SASTA SAMAN and ACHHA SAMAN, 20 through ACHHA SAMAN and AMAZING SAMAN and 35 through SASTA SAMAN and AMAZING SAMAN. What was the maximum number of students who has placed order through all three APPs?

1 **10**2 **15**3 **20**4 **18****Solution:****Correct Answer : 3** **Bookmark** **Answer key/Solution**Total students = $155 = 120 + x + 10 + 20 - x + x - 15 \Rightarrow x = 20$ Maximum value of x will be determined by $20 - x$ i.e., 20.**FeedBack****Q.97**If $x^{\log_{1000} x} > 1000$; then1 $x \in (0, \infty)$ 2 $x \in (0, 1000)$ 3 $x \in \left(0, \frac{1}{1000}\right) \cup (1, \infty)$ 4 $x \in \left(0, \frac{1}{1000}\right) \cup (1000, \infty)$

Solution:**Correct Answer : 4**

$$x^{\log_{1000} x} > 1000$$

Take \log_{1000} on both sides;

$$\log_{1000}(x^{\log_{1000} x}) > \log_{1000} 1000$$

$$\Rightarrow (\log_{1000} x)^2 > 1 \Rightarrow (\log_{1000} x + 1)(\log_{1000} x - 1) > 0$$

$$\Rightarrow (\log_{1000} x) + 1 > 0 \text{ and } (\log_{1000} x) - 1 > 0$$

OR

$$(\log_{1000} x) + 1 < 0 \text{ and } (\log_{1000} x) - 1 < 0$$

$$\Rightarrow \log_{1000} x > 1 \text{ OR } \log_{1000} x < -1$$

$$\therefore x > 1000 \text{ OR } x < \frac{1}{1000}$$

$$\therefore x \in \left(0, \frac{1}{1000}\right) \cup (1000, \infty).$$

Bookmark
Answer key/Solution
Q.98

Daisy and Vineet initially had toffees in the ratio of 3 : 7. If Vineet gave some of his toffees to Daisy, then the ratio of the number of toffees with Daisy to that with Vineet became 4 : 5. What fraction of his initial number of toffees was given by Vineet to Daisy?

1 1/7

2 1/5

3 7/12

4 13/63

Solution:**Correct Answer : 4**
Bookmark
Answer key/Solution

Let Daisy and Vineet initially had 3 and 7 toffees respectively and Vineet gave x toffees to Daisy.

$$\text{Then, } \frac{3+x}{7-x} = \frac{4}{5} \Rightarrow x = \frac{13}{9}$$

Hence, the fraction of his initial number of toffees given by Vineet to Daisy = $\frac{\left(\frac{13}{9}\right)}{7} = \frac{13}{63}$.

Q.99

Let $f(x + y) = f(x) f(y)$ and $f(3) = 2$; then the value of $f(-6)$ is

1 1/2

2 1/4

3 1/6

4 None of these

Solution:

Correct Answer : 2

Given that, $f(x + y) = f(x) \times f(y)$

$$f(3) = f(0 + 3) = f(0) \times f(3)$$

$$\Rightarrow 2 = f(0) \times 2$$

$$\therefore f(0) = 1$$

$$f(6) = f(3 + 3) = f(3) \times f(3) = 4$$

$$\{\because f(3) = 2\}$$

$$f(0) = f(6 + (-6)) = f(6) \times f(-6)$$

$$\Rightarrow 1 = f(6) \times f(-6)$$

$$\therefore f(-6) = \frac{1}{f(6)} = \frac{1}{4}.$$

 **Bookmark**

 **Answer key/Solution**

FeedBack

Q.100

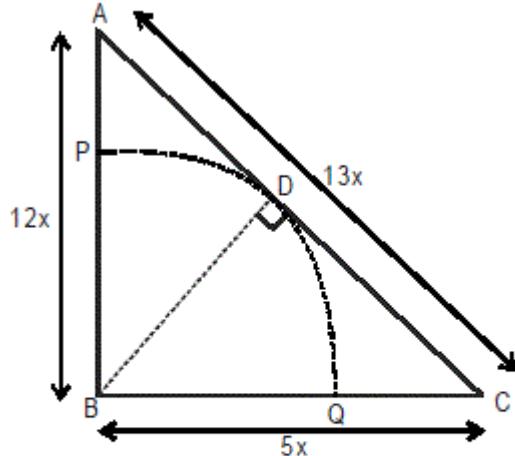
A cone of maximum possible volume is formed by taking right angle of a right angled triangular paper sheet having base and perpendicular in the ratio of 5 : 12 as the vertex of the cone. Find the ratio of radius and height of the cone.

1 1 : $\sqrt{13}$

2 1 : $\sqrt{15}$

3 $\sqrt{13} : \sqrt{15}$

4 $\sqrt{5} : \sqrt{12}$

Solution:**Correct Answer : 2****Bookmark****Answer key/Solution**

Draw $BD \perp AC$,

$$\therefore BD = \frac{5x \times 12x}{13x} = \frac{60x}{13}.$$

Vertex B will be made as vertex of the cone.

In this case BD will be the slant height of cone and arc PQ as circumference of base of the cone.

$$\text{Now, length of arc } PQ = 2 \times \pi \times \frac{60x}{13} \times \frac{90^\circ}{360^\circ} = 2\pi \times \frac{15x}{13}$$

$$\text{Radius of cone} = \frac{2\pi \times \frac{15x}{13}}{2\pi} = \frac{15}{13}x$$

$$\text{Height of the cone} = \sqrt{(\text{slant height})^2 - (\text{base radius})^2}$$

$$= \sqrt{\left(\frac{60x}{13}\right)^2 - \left(\frac{15x}{13}\right)^2} = \sqrt{\frac{3375x^2}{169}} = \frac{15\sqrt{15}x}{13}$$

$$\therefore \text{Required ratio} = \frac{\frac{15x}{13}}{\frac{15\sqrt{15}x}{13}} = \frac{15x \times 13}{13 \times 15\sqrt{15}x} = 1 : \sqrt{15}.$$

FeedBack