

## Mock CAT – 16 2019

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Solutions (Solution.jsp?sid=aaaFOuj1h2PZo7o7VNG6wSat Jan 11 22:31:45 IST  
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QA

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

At the end of the eighteenth century, the French naturalist Jean-Baptiste Lamarck noted that life on earth had evolved over long periods of time into a striking variety of organisms. He sought to explain how they had become more and more complex. Living organisms not only evolved, Lamarck argued; they did so very slowly, “little by little and successively.” In Lamarckian theory, animals became more diverse as each creature strove toward its own “perfection,” hence the enormous variety of living things on earth. Man is the most complex life form, therefore the most perfect, and is even now evolving.

In Lamarck’s view, the evolution of life depends on variation and the accumulation of small, gradual changes. These are also at the center of Darwin’s theory of evolution, yet Darwin wrote that Lamarck’s ideas were “veritable rubbish.” Darwinian evolution is driven by genetic variation combined with natural selection—the process whereby some variations give their bearers better reproductive success in a given environment than other organisms have. Lamarckian evolution, on the other hand, depends on the inheritance of acquired characteristics. Giraffes, for example, got their long necks by stretching to eat leaves from tall trees, and stretched necks were inherited by their offspring, though Lamarck did not explain how this might be possible.

When the molecular structure of DNA was discovered in 1953, it became dogma in the teaching of biology that DNA and its coded information could not be altered in any way by the environment or a person’s way of life. The environment, it was known, could stimulate the expression of a gene. Having a light shone in one’s eyes or suffering pain, for instance, stimulates the activity of neurons and in doing so changes the activity of genes those neurons contain, producing instructions for making proteins or other molecules that play a central part in our bodies.

The structure of the DNA neighboring the gene provides a list of instructions—a gene program—that determines under what circumstances the gene is expressed. And it was held that these instructions could not be altered by the environment. Only mutations, which are errors introduced at random, could change the instructions or the information encoded in the gene itself and drive evolution through natural selection. Scientists discredited any Lamarckian claims that the environment can make lasting, perhaps heritable alterations in gene structure or function.

But new ideas closely related to Lamarck’s eighteenth-century views have become central to our understanding of genetics.

The developing literature and research surrounding epigenetics has forced biologists to consider the possibility that gene expression could be influenced by some heritable environmental factors previously believed to have had no effect over it, like stress or deprivation. “The DNA blueprint,” Carey writes, “isn’t a sufficient explanation for all the sometimes wonderful, sometimes awful, complexity of life. If the DNA sequence was all that mattered, identical twins would always be absolutely identical in every way. Babies born to malnourished mothers would gain weight as easily as other babies who had a healthier start in life.”

That might seem a commonsensical view. But it runs counter to decades of scientific thought about the independence of the genetic program from environmental influence.

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Q.1

The passage makes all of the following claims except:

- 
- 1 ☐ genetic variations within a species can drive natural selection.
- 
- 2 ☐ responses to neural stimuli can lead to genetic changes within the organism.
- 
- 3 ☐ the inheritance of acquired characteristics can be due to genetic mutations.
- 
- 4 ☐ mutation induced faults in genetic code can drive evolution.
-

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Q.2

In the third paragraph the author uses the word “dogma” to refer to the:

1 ☐ firm belief that an organism’s lifestyle can stimulate gene expression, but not cause genetic modifications.

2 ☐ firm belief that environmental factors can alter the gene program, especially under stress and deprivation.

3 ☐ firm belief in the inability of external factors like environmental changes to cause genetic changes.

4 ☐ firm belief in Darwin's Theory of Evolution due to its reliance on the gene code.

FeedBack

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 Answer key/Solution

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### Q.3

It can be inferred from the passage that the author considers evolution to be better explained by:

- 
- 1 ☐ genetic variation combined with natural selection and the gene program.
- 
- 2 ☐ inheritance of acquired traits and environmental factors that cause gene expression.
- 
- 3 ☐ genetic variation, gene expression and the impact of heritable environmental factors.
- 
- 4 ☐ variation and the accumulation of small, gradual changes.
- 

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Q.4

The author has given the example of “babies born to malnourished mothers.....” in order to illustrate that:

- 
- 1 ☐ babies born to malnourished mothers would not gain weight as easily as those babies who had a healthier start in life.
- 
- 2 ☐ the belief that the genetic program is independent of environmental influence may not always hold true.
- 
- 3 ☐ unlike the environmental factors that can impact gene expression, genetic code is a stronger indicator of genetic traits.
- 
- 4 ☐ the Lamarckian idea of evolution explained by genetic variation and gene expression is faulty.
-

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Q.5

Which of the following would best fit the Lamarckian idea of an organism 'striving towards perfection' as is discussed in the passage?

1 ☐ Malnourished mothers who have healthy babies.

2 ☐ Identical twins with different eye color.

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3 ☐ The extended snout of anteaters.


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4 ☐ Chimpanzees that learn to communicate using sign language.

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 **Bookmark**

 **Answer key/Solution**



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

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The Standard Model is the pinnacle of our achievements to date, with some of its theoretical predictions having been verified to within a one-in-ten-billion chance of error—a simply astounding degree of accuracy. But it leaves many questions unanswered. For one, where does gravity come from? Why do matter particles always possess three ever-heavier copies, with peculiar patterns in their masses? What is dark matter, and why does the universe contain more matter than antimatter?

In the hope of solving some of these mysteries, physicists have been grafting elegant and exciting new mathematical structures onto the Standard Model. The program follows an arc traced by fundamental physics since the time of Isaac Newton: the pursuit of unification, in which science strives to explain seemingly disparate “surface” phenomena by identifying, theorizing, and ultimately proving their shared “bedrock” origin. This top-down, reductive style of thinking has yielded many notable discoveries. Newton perceived that both an apple falling to the ground and the planets orbiting around the Sun could be explained by gravity. The physicist Paul Dirac came up with antimatter in 1928 by marrying quantum mechanics and Einstein's special theory of relativity. And since the late 20th century, string theorists have been trying to reconcile gravity and quantum physics by conceiving of particles as tiny vibrating loops of string that exist in somewhere between 10 and 26 dimensions.

So, when the European Organization for Nuclear Research (CERN) cranked up the LHC just outside Geneva for a second time in 2015, hopes for empirical validation were running high. Physicists' most adventurous top-down thinking would finally be put to the test. In its first three-year run, the LHC had already notched up one astounding success: In 2012, CERN announced that the Higgs boson had been found, produced by high-energy, head-on collisions between protons. The new particle existed for just a fleeting fraction of a second before decaying into a pair of tell-tale photons at specific, signature energies. What set the scientific world alight was not the excitement of a new particle per se, but the fact it was a smoking gun for a theory about how matter gets its mass. Until the British physicist Peter Higgs and others came up with their hypothetical boson in 1964, the emerging mathematical model had predicted—against the evidence—that particles should have no mass at all. Eventually, half a century after the “fix” was first proposed, the boson officially entered the subatomic bestiary, the last bit of the Standard Model to be experimentally verified.

This time, though, none of the more exotic particles and interactions that theorists hoped to see has been forthcoming. No stop squarks, no gluinos, no neutralinos. The null results are now encrusting the hull of the Standard Model like barnacles on a beautiful old frigate and dragging her down to the ocean floor. My colleagues and I have watched the LHC closely for tell-tale signs. None have been found. We started to ask whether we might have missed them somehow. Perhaps some of the particles being produced were too low in energy for the collisions to be observed. Or perhaps we were wrong about dark matter particles – maybe there was some other, unstable type of particle.

It looks as though the centuries-long quest for top-down unification has stalled, and particle physics might have a full-blown crisis on its hands.

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Q.6

The author has used the term “fix” to refer to:

- 
- 1 ☐ the Higgs boson, which helped explain particles having no mass as predicted by the emerging mathematical model of 1964.
- 
- 2 ☐ the changes made in Peter Higgs' theory and the Standard Model to account for the missing mass of particles as verified by the LHC.
- 
- 3 ☐ the restoration of the then emerging mathematical model of 1964 as a valid part of the Standard Model.
-

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Q.7

Which of the following best explains the “growing unease” felt by physicists?

- 1 ☐ The physicists’ quest for top-down unification has come to an end.
- 2 ☐ The squarks, gluinos and neutralinos being produced were too low in energy for the collisions to be observed.
- 3 ☐ Despite running experiments, we cannot explain fundamental questions about gravity, dark matter and antimatter.
- 4 ☐ Failure to observe the subatomic particles in LHC, which are crucial to the survival of the Standard Model.

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Q.8

Which of the following can be inferred about the 2015 LHC experiment?

- 
- 1 ☐ The LHC experiment in 2015 was expected to provide data in support of the Standard Model.
- 
- 2 ☐ It could bombard high energy subatomic particles like neutrons and protons.
- 
- 3 ☐ Its purpose was the search for subatomic particles like bosons.
-

4  Data from the experiment revealed that the articles being produced were too low in energy for making observations.

FeedBack

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This time, though, none of the more exotic particles and interactions that theorists hoped to see has been forthcoming. No stop squarks, no gluinos, no neutralinos. The null results are now encrusting the hull of the Standard Model like barnacles on a beautiful old frigate and dragging her down to the ocean floor. My colleagues and I have watched the LHC closely for tell-tale signs. None have been found. We started to ask whether we might have missed them somehow. Perhaps some of the particles being produced were too low in energy for the collisions to be observed. Or perhaps we were wrong about dark matter particles – maybe there was some other, unstable type of particle.

It looks as though the centuries-long quest for top-down unification has stalled, and particle physics might have a full-blown crisis on its hands.

**Q.9**

The author suggests all of the following about the Higgs boson EXCEPT:

- 1 ☐ The Higgs boson is a subatomic particle that aided the ‘pursuit of unification’ in physics.
- 2 ☐ The Higgs boson helped prove a theory about how matter gets its mass.
- 3 ☐ The Higgs boson had been produced by colliding protons at high energy.
- 4 ☐ The Higgs boson produces very high energy, hence the collisions could be observed.

FeedBack

 **Bookmark**

 **Answer key/Solution**

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

In recent years, physicists have been watching the data coming in from the Large Hadron Collider (LHC) with a growing sense of unease. We've spent decades devising elaborate theories to account for the behavior of the quantum zoo of subatomic particles, the most basic components of the known universe.

The Standard Model is the pinnacle of our achievements to date, with some of its theoretical predictions having been verified to within a one-in-ten-billion chance of error—a simply astounding degree of accuracy. But it leaves many questions unanswered. For one, where does gravity come from? Why do matter particles always possess three ever-heavier copies, with peculiar patterns in their masses? What is dark matter, and why does the universe contain more matter than antimatter?

In the hope of solving some of these mysteries, physicists have been grafting elegant and exciting new mathematical structures onto the Standard Model. The program follows an arc traced by fundamental physics since the time of Isaac Newton: the pursuit of unification, in which science strives to explain seemingly disparate “surface” phenomena by identifying, theorizing, and ultimately proving their shared “bedrock” origin. This top-down, reductive style of thinking has yielded many notable discoveries. Newton perceived that both an apple falling to the ground and the planets orbiting around the Sun could be explained by gravity. The physicist Paul Dirac came up with antimatter in 1928 by marrying quantum mechanics and Einstein's special theory of relativity. And since the late 20th century, string theorists have been trying to reconcile gravity and quantum physics by conceiving of particles as tiny vibrating loops of string that exist in somewhere between 10 and 26 dimensions.

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It looks as though the centuries-long quest for top-down unification has stalled, and particle physics might have a full-blown crisis on its hands.

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Q.10

All of the following can be inferred about the Standard Model EXCEPT:

- 
- 1 ☐ Physicists have been attaching new mathematical structures to it to help solve mysteries in physics.
- 
- 2 ☐ It helps connect disparate scientific phenomena by underscoring their similar origins.
- 
- 3 ☐ Its popularity was on the decline prior to the discovery of the Higgs boson in 2012.
- 
- 4 ☐ The absence of tell-tale signs of squarks, gluinos and neutralinos can be disastrous for it.
-

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**Direction for questions (11-14): Read the given passage and answer the questions that follow.**

**The personal information of more than a billion Indians stored in the world's largest biometric database can be bought online for less than £6, according to an investigation report.**

**The reported breach is the latest in a series of alleged leaks from the Aadhaar database, which has been collecting the photographs, thumbprints, retina scans and other identifying details of every Indian citizen.**

**The report claimed that software is also being sold online that can generate fake Aadhaar cards, an identity document that is required to access a growing number of government services including free meals and subsidised grain.**

**The Unique Identification Authority of India (UIDAI), which administers the Aadhaar system, said it appeared the report had accessed only limited details through a search facility that had been made available to government officials.**

**It said it would seek to press charges against those who had "misused" the system, but stressed that no thumbprints or retina scans had been made available. "Mere display of demographic information cannot be misused without biometrics," it said in a statement. "Claims of bypassing or duping the Aadhaar enrolment system are totally unfounded. Aadhaar data is fully safe and secure and has robust, uncompromised security."**

**The report said anonymous people in WhatsApp groups were charging 500 rupees (£5.82) for the details of an account that allowed access to information from the Aadhaar database. This included a person's name, home and email addresses, photographs and phone numbers.**

**The report claimed that it purchased a code and was able to gain access to the information, as well as to the software that permits users to print fake Aadhaar cards. This report has not been verified though.**

**More than 200 government websites were revealed in November to have published the Aadhaar numbers of citizens along with the names, addresses and bank details. UIDAI said that in that case the information had been inadvertently published by other government departments and was removed as soon as the breach became apparent.**

**Aadhaar workers have spent the past four years traversing India taking the names and photographs and scanning the eyeballs and thumbs of more than a billion people. The government says the database will bring vast numbers of Indians into the digital economy, allowing direct access to social programmes in a country where one study has estimated 84% of welfare funds are lost to intermediaries.**

**But critics argue that the benefits of Aadhaar are overblown and that such an enormous and potentially lucrative database can never be fully secured.**

**Activists also blame glitches in the rollout of the scheme for the death by starvation of at least two people who were unable to access rations, a welfare programme that now requires Aadhaar authentication.**

**In August, the supreme court ruled that privacy was a fundamental right guaranteed by the Indian constitution, a decision legal analysts predict could leave parts of the Aadhaar programme vulnerable to legal challenge.**

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**Q.11**

**The main message of this passage is that:**

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1 ☐ the issue of privacy breach must be tackled with the strictest possible punishment.

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2 ☐ the reported breach of data is a worrisome matter.

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3 ☐ the government has completely botched its mission to make India digitally safe.

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4 ☐ Aadhaar as a scheme has failed to make India secure.

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FeedBack

 **Bookmark**

 **Answer key/Solution**

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Aadhaar workers have spent the past four years traversing India taking the names and photographs and scanning the eyeballs and thumbs of more than a billion people. The government says the database will bring vast numbers of Indians into the digital economy, allowing direct access to social programmes in a country where one study has estimated 84% of welfare funds are lost to intermediaries.

But critics argue that the benefits of Aadhaar are overblown and that such an enormous and potentially lucrative database can never be fully secured.

Activists also blame glitches in the rollout of the scheme for the death by starvation of at least two people who were unable to access rations, a welfare programme that now requires Aadhaar authentication.

In August, the supreme court ruled that privacy was a fundamental right guaranteed by the Indian constitution, a decision legal analysts predict could leave parts of the Aadhaar programme vulnerable to legal challenge.

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**Q.12**

**Which of the following can be inferred to be the main objection of the critics of the Aadhaar scheme?**

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1 ☐ This scheme will deprive people of their fundamental rights.

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2 ☐ It has deprived many citizens from accessing government assistance programmes.

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3 ☐ It has posed a lot of threat to the internal security of the country.

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4 ☐ Its safety measures are susceptible and can't be vouched for.

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In August, the supreme court ruled that privacy was a fundamental right guaranteed by the Indian constitution, a decision legal analysts predict could leave parts of the Aadhaar programme vulnerable to legal challenge.

**Q.13**

**According to the passage, all of the following are true EXCEPT:**

1 ☐ Generation of fake documents is possible online.

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2 ☐ The highest court of India has upheld the significance of privacy in a citizen's life.

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3 ☐ Privacy information leak and breach of security is a phenomenon unique to India.

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4 ☐ The government concedes that some departments made an error with regards to Aadhar information.

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FeedBack

 **Bookmark**

 **Answer key/Solution**

Direction for questions (11-14): Read the given passage and answer the questions that follow.

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Q.14

This passage is most likely an excerpt from:

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1 ☐ an investigative report.

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2 ☐ a government report.

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3 ☐ a newspaper report.

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4 ☐ a social study report.

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Direction for questions (15-19): Read the given passage and answer the questions that follow.

The existence of something like a human nature that separates us from the rest of the animal world has often been implied, and sometimes explicitly stated, throughout the history of philosophy. Aristotle thought that the 'proper function' of human beings was to think rationally, from which he derived the idea that the highest life available to us is one of contemplation – hardly unexpected from a philosopher. The Epicureans argued that it is a quintessential aspect of human nature that we are happier when we experience pleasure, and especially when we do not experience pain. Thomas Hobbes believed that we need a strong centralized government to keep us in line because our nature would otherwise lead us to live a life that he memorably characterised as 'solitary, poor, nasty, brutish, and short'. Jean-Jacques Rousseau embedded the idea of a human nature in his conception of the 'noble savage'. Confucius and Mencius thought that human nature is essentially good, while Hsün Tzu considered it essentially evil.

The keyword here is, of course, 'essentially'. One of the obvious exceptions to this trend was John Locke, who described the human mind as a '*tabula rasa*' (blank slate), but his take has been rejected by modern science. As one group of cognitive scientists describes, our mind is more like a colouring book, or a 'graffiti-filled wall of a New York subway station' than a blank slate.

In contrast, many contemporary philosophers, both of the so-called analytic and continental traditions, seem largely to have rejected the very idea of human nature. A prominent example is Jesse Prinz, who argues forcefully for what is referred to as a 'nurturist' (as opposed to a 'naturist') position. More recently, Ronnie de Sousa argued that modern science shows that human nature does not exist and, drawing on Jean-Paul Sartre's notion of radical freedom, concluded that this favours an existentialist philosophical outlook.

What exactly does science tell us about the idea of a human nature? If we take evolutionary biology seriously, then we certainly should reject any essentialist conception of it, such as Aristotle's. There is no immutable, clearly defined 'essence' that characterizes human beings, and only them, within the whole animal world. From Charles Darwin onward, the scientific consensus has been pretty clear: we are but one species among millions on Earth, members of a not particularly numerous branch of the tree of life, endowed with unusually large and structurally complex brains. Our particular lineage gave origin to the species *Homo sapiens* at least 300,000 years ago, resulting from a long evolutionary period, which unfolded over millions of years from the point of divergence from our most recent common ancestor with the chimpanzees, our closest phylogenetic cousins.

Put that way, it would seem that biology does indeed do away with any idea of human nature: whatever characteristics our species possesses are the result of a continuous process of evolutionary differentiation from other species of primates, and there is no reason to believe that such process is over, or will be any time soon. [...]

Q.15

As per the passage, which of the following best captures Darwin's view on human nature?

- 1 ☐ Humans are neither unique nor special, if looked at from an evolutionary point of view.
- 2 ☐ The theory related to human nature has united scientists as they all have rejected its existence.
- 3 ☐ Human nature can be attributed to the huge and structurally complex brain that defines a human being.
- 4 ☐ The evolution of human nature is neither significant nor over.

Direction for questions (15-19): Read the given passage and answer the questions that follow.

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Q.16

As per the passage, which of the following is definitely true?

- 1 ☐ Aristotle surprised scholars with his advocacy of the inherent goodness of human life.
- 2 ☐ Ronnie de Sousa criticized Jean-Paul Sartre for not propagating the correct values of existentialism.
- 3 ☐ Hsün Tzu was a contemporary of Confucius and Mencius.
- 4 ☐ John Locke's theory has not achieved acceptance among modern scientists.

Direction for questions (15-19): Read the given passage and answer the questions that follow.

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Q.17

Why does the author give the example of the 'graffiti-filled wall of a New York subway station'?

- 1 ☐ To debunk the accuracy of John Locke's philosophy.
- 2 ☐ To support the concept of 'tabula rasa'.
- 3 ☐ To explain the modern scientific stance on human nature.
- 4 ☐ To advocate cognitive science as an emerging field.



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Q.18

As per the passage, Jean-Jacques Rousseau would least likely agree with which of the following with respect to the concept of human nature?

1 ☐ Aristotle

2 ☐ Ronnie de Sousa

3 ☐ Confucius

4 ☐ Hsün Tzu

Direction for questions (15-19): Read the given passage and answer the questions that follow.

The existence of something like a human nature that separates us from the rest of the animal world has often been implied, and sometimes explicitly stated, throughout the history of philosophy. Aristotle thought that the 'proper function' of human beings was to think rationally, from which he derived the idea that the highest life available to us is one of contemplation – hardly unexpected from a philosopher. The Epicureans argued that it is a quintessential aspect of human nature that we are happier when we experience pleasure, and especially when we do not experience pain. Thomas Hobbes believed that we need a strong centralized government to keep us in line because our nature would otherwise lead us to live a life that he memorably characterised as 'solitary, poor, nasty, brutish, and short'. Jean-Jacques Rousseau embedded the idea of a human nature in his conception of the 'noble savage'. Confucius and Mencius thought that human nature is essentially good, while Hsün Tzu considered it essentially evil.

The keyword here is, of course, 'essentially'. One of the obvious exceptions to this trend was John Locke, who described the human mind as a '*tabula rasa*' (blank slate), but his take has been rejected by modern science. As one group of cognitive scientists describes, our mind is more like a colouring book, or a 'graffiti-filled wall of a New York subway station' than a blank slate.

In contrast, many contemporary philosophers, both of the so-called analytic and continental traditions, seem largely to have rejected the very idea of human nature. A prominent example is Jesse Prinz, who argues forcefully for what is referred to as a 'nurturist' (as opposed to a 'naturalist') position. More recently, Ronnie de Sousa argued that modern science shows that human nature does not exist and, drawing on Jean-Paul Sartre's notion of radical freedom, concluded that this favours an existentialist philosophical outlook.

What exactly does science tell us about the idea of a human nature? If we take evolutionary biology seriously, then we certainly should reject any essentialist conception of it, such as Aristotle's. There is no immutable, clearly defined 'essence' that characterizes human beings, and only them, within the whole animal world. From Charles Darwin onward, the scientific consensus has been pretty clear: we are but one species among millions on Earth, members of a not particularly numerous branch of the tree of life, endowed with unusually large and structurally complex brains. Our particular lineage gave origin to the species *Homo sapiens* at least 300,000 years ago, resulting from a long evolutionary period, which unfolded over millions of years from the point of divergence from our most recent common ancestor with the chimpanzees, our closest phylogenetic cousins.

Put that way, it would seem that biology does indeed do away with any idea of human nature: whatever characteristics our species possesses are the result of a continuous process of evolutionary differentiation from other species of primates, and there is no reason to believe that such process is over, or will be any time soon. [...]

Q.19

The author develops his argument about human nature by:

- 1 ☐ continuously contradicting his own view points.
- 2 ☐ presenting a linear narrative of the defenders of the theory.
- 3 ☐ selectively choosing examples that support his theory.
- 4 ☐ portraying varying arguments that explain the stance of thinkers on the topic.

Direction for questions (20-24): Read the given passage and answer the questions that follow.

[...] Big Data is the phenomena whereby governments and corporations collect and analyze information provided by measuring sensors and internet searches. Nudging is the view that governments should build choice architectures that make it easier for people to pick, say, the more fuel-efficient car or the more sensible retirement plan. Big nudging is the combination of the two that enables public or private engineers to subtly influence the choices that people make, say, by auto-filling internet searches in desirable ways. Big nudging is a 'digital sceptre that allows one to govern the masses efficiently, without having to involve citizens in democratic processes'. The symposium's authors take for granted that democracy – the political regime in which the people collectively determine its common way of life – is better than epistocracy, or rule by experts.

Remarkably, many social scientists today do not share the belief that democracy is better than epistocracy. On the contrary, in recent years, numerous political theorists and philosophers have argued that experts ought to be in charge of public policy and should manipulate, or contain, the policy preferences of the ignorant masses. This view has its roots in Plato's '*Republic*', where philosophers who see the sun of truth should govern the masses who dwell in a cave of ignorance, and in Walter Lippmann's '*Public Opinion*', where expert social scientists rule behind the scenes and control the population with propaganda. While there are differences between the views of Christopher H Achen and Larry Bartels in '*Democracy for Realists*', Jason Brennan in '*Against Democracy*', and Tom Nichols in '*The Death of Expertise*', these social scientists share in common an elitist antipathy towards participatory democratic politics.

In '*Democracy for Realists*', for instance, the authors criticise what they call the 'folk theory' of democracy. This maintains that elected representatives should translate their constituents' preferences into public policy. The problem, according to these political scientists, is that most voters lack the time, energy or ability to immerse themselves in the technicalities of public policy. Instead, people tend to vote based on group identification, or an impulse to align with one political faction rather than another.

In a memorable chapter of their book, Achen and Bartels show that politicians often suffer electoral defeat for events beyond their control. In the summer of 1916, for example, New Jersey's beachgoers experienced a series of shark attacks. In that November's election, the beach towns gave President Woodrow Wilson fewer votes than New Jersey's non-beach towns. The voters, it seems, were punishing Wilson for the shark attacks. According to Achen and Bartels, voters' ability 'to make sensible judgments regarding credit and blame is highly circumscribed'. This is a polite way of saying that most voters are not smart enough to realise that presidents are not responsible for shark attacks.

Achen and Bartels ostensibly defend a conception of democracy. But the force of their argument, and spirit of their book, heaps ridicule on the 'Romantic' or 'quixotic' notion that the people should rule. They compare 'the ideal of popular sovereignty' – a cornerstone of modern democratic political theory – to the medieval notion of a 'divine right of kings'. A more realistic view is that 'policymaking is a job for specialists'.

Many political actors around the world, similarly, think that epistocrats should rule and try to gain the emotional support of the population. [...]

Q.20

Which of the following statements best captures the essence of the author's argument in the passage?

- 1 ☐ Epistocracy is better than democracy when it comes to making a country prosperous.

2 ☐ Many authors and political scientists have criticized democratic practices as being superstitious and narrow-minded.

3 ☐ When it comes to policy making, some thinkers back epistocracy over democracy.

4 ☐ What the world needs right now is a pragmatic approach towards governance.

FeedBack

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 Answer key/Solution

Direction for questions (20-24): Read the given passage and answer the questions that follow.

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Q.21

Which of the following has not been cited as a criticism of democracy in the passage?

1 ☐ Masses can be ignorant.

2 ☐ Masses are not well-informed to make proper policies.

3 ☐ The tendency to identify with a group can be detrimental to the governing process.

4 ☐ Democratic practices are inherently biased against experts.

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 **Bookmark**

 **Answer key/Solution**

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Many political actors around the world, similarly, think that epistocrats should rule and try to gain the emotional support of the population. [...]

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Q.22

Which of the following can be inferred about 'big data nudging' as per the passage?

- 
- 1 ☐ It encourages the worst impulse of politicians who want to manipulate the public sentiment.
- 
- 2 ☐ It facilitates the actors who operate behind the scenes when it comes to influencing public decision.
- 
- 3 ☐ It is the unfortunate side effect of democracy.
- 
- 4 ☐ It depends majorly on the internet world to be effective.
-



Direction for questions (20-24): Read the given passage and answer the questions that follow.

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Q.23

Which of the following is not true regarding the work of Achen and Bartels, as per the passage?

- 1 ☐ They are elites who don't believe that a common man can be a good policy maker.

- 2 ☐ They criticize the feature of democracy that requires elected representatives to primarily focus on the wishes of their constituents.
- 3 ☐ They don't believe that majority of the common people are informed enough to make effective policy decisions.
- 4 ☐ They advocate a practical approach towards democracy.

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 Answer key/Solution

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Q.24

Why does the author give the example of the shark attacks in New Jersey?

- 1 ☐ To praise the work of Achen and Bartels.
- 2 ☐ To highlight a flaw in democracy as discussed by two critics.
- 3 ☐ To support the case for espousing epistocracy and discarding democracy.
- 4 ☐ To highlight a funny incident mentioned in the book by Achen and Bartels.

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 Answer key/Solution

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. What I want you to imagine is that part of your visual system is like such a balance.
2. Let me begin with an image.
3. Its very appearance tells us what it is to be accurate.
4. It is of an old-fashioned beam balance of the sort that blind Justice is often portrayed as holding.

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 Answer key/Solution

Q.26

Directions for question (26): 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. It is responsible for the motion of our bodies, the energy sources that drive our economy, and basically anything else you care about.
2. If something has measurable interactions, it is worth paying attention to.
3. For nearby structure, ordinary matter is in charge.
4. Because it will have far more immediate effects on whatever is around.

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 Answer key/Solution

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### Q.27

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

Jefferson was nicknamed "Long Tom" because he stood 6' 2 1/2" tall, with long, slender limbs. He had carrot-red hair that paled with age. Jefferson eschewed the uniforms of nobility, choosing instead to dress himself in sometimes dirty and tattered clothing. Jefferson was the quintessential Renaissance man and has been described as a(n): lawyer, linguist, diplomat, astronomer, naturalist, political philosopher, educator, statesman, president, "farmer," musician, scientist, inventor, agriculturalist, horseman, geographer, theologian and paleontologist. Jefferson was fluent in Greek, Latin, French, Spanish, Italian, German, and was a supporter of equal rights and education for women, the right of all to have a free public education, a free library system and the creation of decimal system of weights and measures. He is also considered one of the preeminent architects in the history of the country.

- 1 ☐ A man of many talents, Jefferson, the original renaissance man, donned multiple socio-political roles during his lifetime.
- 2 ☐ Jefferson was the quintessential renaissance man: complex, talented, and unconventional.
- 3 ☐ Jefferson, a historic figure, was a polyglot, multi-talented and believed in the principles of renaissance.
- 4 ☐ Jefferson, in addition to his unique physique, was a reformer at heart, just like any other quintessential renaissance man.

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 Answer key/Solution

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### Q.28

Directions for question (28): 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. There are feedback processes to consider.
2. But these feedbacks are not suddenly switched on at an arbitrary time.
3. Things change on a warmer world, and these changes can in turn warm the world, which changes things, and on and on in a vicious spiral toward unimaginable danger.
4. All of these things are magnified as the temperature increases, but if there is a sharp break, it will not come at a degree and a half or two degrees.
5. They are currently in operation, humming menacingly in the background.

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 Answer key/Solution

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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. If we don't seize this opportunity, it could take 208 years to get to equality.
- 2. All these women contributed to the vision of a better, more equal version of our country that we are still working toward today.
- 3. We'd be closing in on Abigail Adams's 500th birthday: equality can't wait that long.
- 4. But none of them had the opportunity that we have now to accelerate the pace of change and bend the curve.

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Answer key/Solution

Q.30

Directions for question (30): 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. The average American currently eats 126 grams of sugar a day—though most don't realize it.
- 2. It's found in virtually all packaged foods and drinks and most food at fast food restaurants.
- 3. The American Heart Association says men should eat no more than 37.5 grams of sugar a day and women should eat no more than 25 grams.
- 4. Much of that amount comes from the refined sugars added to our foods during manufacturing.
- 5. But the World Health Organization now says even those allowances are too high, suggesting both men and women should eat 25 grams or fewer each day.

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Answer key/Solution

Q.31

Directions for question (31): The passage given below is followed by four summaries. Choose the option that best captures the author's position.

Symbolic logic is essentially concerned with inference in general, and is distinguished from various special branches of mathematics mainly by its generality. Neither mathematics nor symbolic logic will study such special relations like temporal priority, but mathematics will deal explicitly with the class of relations possessing the formal properties which are summed up in the notion of continuity. But symbolic logic will not investigate what inferences are possible in respect of continuous relations; this investigation belongs to mathematics. What symbolic logic does investigate is the general rules by which inferences are made.

- 1 ☐ Symbolic logic is a special branch of mathematics that studies general rules for making inferences, whereas mathematics deals with formal properties summed up in the notion of continuity.

2 ☐ Symbolic logic and mathematics are alike, in that they both don't study special relations like temporal priority, but they differ in the way they study inferences as symbolic logic is centered on properties summed up in the notion of continuity whereas maths deals with general rules.

3 ☐ The commonality between symbolic logic and maths is that they both don't study special relations but they study inferences using different methods.

4 ☐ Both symbolic logic and maths don't study certain special relations; however, they differ in the way they study inferences, as symbolic logic is centered on general rules whereas maths deals with formal properties summed up in the notion of continuity.

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 Answer key/Solution

Q.32

Directions for question (32): 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. The problem with Piketty's estimates lies in his assumptions.
2. For the richest 5% (those above the 95th percentile), he uses income data imputed from tax filings.
3. Given that survey data often understates the extent of true incomes, Piketty relies on a combination of survey and tax data to estimate India's income distribution.
4. In doing so, he assumes that up to the 90th percentile, i.e. for the bottom 90% of the population, survey data reflect actual income levels.

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 Answer key/Solution

Q.33

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

1. The best and the worst of Labour are locked in mortal combat at their conference, less left and right, more the commendable and the despicable, often tussling within the souls of the very same players.
2. Shorter working hours and better pay are only part of Labour's intent to shift the share of income, power and wealth at least back to where it was 40 years ago.
3. Admirable visions of all that could be under a Labour government were spelled out in John McDonnell's radical stream of policies to make bad working lives better.
4. Ken Loach's latest harrowing horror movie, Sorry We Missed You is a heartrending depiction of the working wrongs that McDonnell addresses.
5. Some working conditions have reverted to brutish pre-union days: the care workers, delivery drivers, warehouse pickers, overworked and underpaid.

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🔍 Answer key/Solution

Q.34

Directions for question (34): The passage given below is followed by four summaries. Choose the option that best captures the author's position.

In "The Spirit Level", a bestselling book of 2009, Richard Wilkinson and Kate Pickett argue that inequality "gets under the skin" and makes everyone worse off, not just the poor. They mean "gets under the skin" literally. The argument is that inequality causes chronic stress, and makes people secrete too much of a hormone called cortisol. This normally has benign metabolic and other functions. Produced in large quantities, it can harm, among other things, the brain and the immune system. So cortisol may be a direct link between inequality and bad health.

- 1 ☐ As per Wilkinson and Pickett, poverty is the main cause behind chronic stress which is caused by excessive production of cortisol and results in brain and immune system damage.
- 2 ☐ Wilkinson and Pickett have argued that chronic stress affects the production of cortisol in poor people causing some harm.
- 3 ☐ Two economists have postulated that just like beauty, poverty is skin deep and can be treated by controlling the secretion of cortisol.
- 4 ☐ As per Wilkinson and Pickett, poverty is exacerbated by cortisol which causes chronic stress.

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🔍 Answer key/Solution

## Sec 2

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


Last year, in 2018, six couples each having a child celebrated the birthday of their children. Each couple celebrated 1st, 2nd, 3rd, 4th, 5th and 6th birthday of their children in no specific order and invited atleast two other couples. The number of couples invited on (n + 1)th birthday celebration was not more than that invited on the nth birthday celebration. The sum of number of couples invited on six birthday celebrations together was 17. A, B, C, D, E, and F were males and H, J, K, L, M and N were females in any order among six couples. The other information is as below:-


- (i) Three couples were invited on 2nd birthday celebration of the child of couple AK. E and F were invited by the maximum number of couples.
- (ii) L invites H and vice-versa. The number of couples invited on 4th birthday celebration was less than that invited on 3rd birthday celebration.
- (iii) J's child was the youngest and N, whose child was the oldest, was invited by three couples but only if couple FH was also invited.
- (iv) 'A' was invited on 3rd birthday celebration of M's child and C was invited only on 3rd and 4th birthday celebration.
- (v) A, C and D were invited by 2 couples and D and his wife were invited only if L was also invited there.

Q.35  
Couples invited by N were

- 1 ☐ DM and EL
- 2 ☐ DM and BL
- 3 ☐ FH and AK
- 4 ☐ BJ and DM

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 **Answer key/Solution**

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

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- (iv) 'A' was invited on 3rd birthday celebration of M's child and C was invited only on 3rd and 4th birthday celebration.
- (v) A, C and D were invited by 2 couples and D and his wife were invited only if L was also invited there.

Q.36  
Who was the host of 1st birthday celebration?

1 ☐ CJ

2 ☐ BJ

3 ☐ DJ

4 ☐ Either (1) or (2)

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 Answer key/Solution

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

Last year, in 2018, six couples each having a child celebrated the birthday of their children. Each couple celebrated 1st, 2nd, 3rd, 4th, 5th and 6th birthday of their children in no specific order and invited at least two other couples. The number of couples invited on  $(n + 1)$ th birthday celebration was not more than that invited on the  $n$ th birthday celebration. The sum of number of couples invited on six birthday celebrations together was 17. A, B, C, D, E, and F were males and H, J, K, L, M and N were females in any order among six couples. The other information is as below:-

- (i) Three couples were invited on 2nd birthday celebration of the child of couple 'AK'. E and F were invited by the maximum number of couples.
- (ii) L invites H and vice-versa. The number of couples invited on 4th birthday celebration was less than that invited on 3rd birthday celebration.
- (iii) J's child was the youngest and N, whose child was the oldest, was invited by three couples but only if couple 'FH' was also invited.
- (iv) 'A' was invited on 3rd birthday celebration of M's child and C was invited only on 3rd and 4th birthday celebration.
- (v) A, C and D were invited by 2 couples and D and his wife were invited only if L was also invited there.

**Q.37**

**By how many couples was B invited?**

1 ☐ 2

2 ☐ 3

3 ☐ 4

4 ☐ Either (2) or (3)

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 Answer key/Solution

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


Last year, in 2018, six couples each having a child celebrated the birthday of their children. Each couple celebrated 1st, 2nd, 3rd, 4th, 5th and 6th birthday of their children in no specific order and invited at least two other couples. The number of couples invited on  $(n + 1)$ th birthday celebration was not more than that invited on the  $n$ th birthday celebration. The sum of number of couples invited on six birthday celebrations together was 17. A, B, C, D, E, and F were males and H, J, K, L, M and N were females in any order among six couples. The other information is as below:-


- (i) Three couples were invited on 2nd birthday celebration of the child of couple 'AK'. E and F were invited by the maximum number of couples.
- (ii) L invites H and vice-versa. The number of couples invited on 4th birthday celebration was less than that invited on 3rd birthday celebration.
- (iii) J's child was the youngest and N, whose child was the oldest, was invited by three couples but only if couple 'FH' was also invited.
- (iv) 'A' was invited on 3rd birthday celebration of M's child and C was invited only on 3rd and 4th birthday celebration.
- (v) A, C and D were invited by 2 couples and D and his wife were invited only if L was also invited there.

Q.38  
Whose child was second oldest among them?

- 1 ☐ EL
- 2 ☐ BN
- 3 ☐ DM
- 4 ☐ EN

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 **Answer key/Solution**



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

The table given below depicts the partial information about the prices (in Rupees) of a share in four different companies – P, Q, R, and S – on six days i.e., Monday to Saturday of a week. The price of that share is always more than Rs. 50 but less than Rs. 100. No two companies have same share price on the same day. Worth index, an integral value, of a company on a day can be calculated using the price of the share in the company on that day by the given formula:

Worth index =  $\frac{\text{Price of a share} \times x}{(x + 1)}$ , where x is the serial number of the day.

Serial number of the days are as 1, 2, 3, ..., 6 for Monday, Tuesday, Wednesday, ..., Saturday respectively.

Company \ Day	P	Q	R	S
Monday	58		70	
Tuesday	60	54		
Wednesday		68		96
Thursday		90	80	
Friday			90	54
Saturday	98			63

- Further, some additional information is also known:
- (i) The sum of prices per share of company Q on six days is 1 more than that of company P. Worth index of company R is same for three days.
  - (ii) Total worth index of the four companies on the six days i.e., from Monday to Saturday is 140, 184, 213, 248, 240 and 258, in that order. For company Q, the sum of worth indices is 87 for two pairs of days.
  - (iii) Only one company has a worth index equal to or less than 50 on Friday. Share prices on Saturday are even numbers for three companies.

Q.39  
The sum of worth indices of company P is

- 1 320
- 2 319
- 3 315
- 4 316

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Answer key/Solution

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

The table given below depicts the partial information about the prices (in Rupees) of a share in four different companies – P, Q, R, and S – on six days i.e., Monday to Saturday of a week. The price of that share is always more than Rs. 50 but less than Rs. 100. No two companies have same share price on the same day. Worth index, an integral value, of a company on a day can be calculated using the price of the share in the company on that day by the given formula:

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- (i) The sum of prices per share of company Q on six days is 1 more than that of company P. Worth index of company R is same for three days.
  - (ii) Total worth index of the four companies on the six days i.e., from Monday to Saturday is 140, 184, 213, 248, 240 and 258, in that order. For company Q, the sum of worth indices is 87 for two pairs of days.
  - (iii) Only one company has a worth index equal to or less than 50 on Friday. Share prices on Saturday are even numbers for three companies.

Q.40  
The sum of share prices (in Rs.) of all four companies in six days taken together is

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Answer key/Solution

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

The table given below depicts the partial information about the prices (in Rupees) of a share in four different companies – P, Q, R, and S – on six days i.e., Monday to Saturday of a week. The price of that share is always more than Rs. 50 but less than Rs. 100. No two companies have same share price on the same day. Worth index, an integral value, of a company on a day can be calculated using the price of the share in the company on that day by the given formula:

Worth index =  $\frac{\text{Price of a share} \times x}{(x + 1)}$ , where x is the serial number of the day.

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Thursday		90	80	
Friday			90	54
Saturday	98			63

- Further, some additional information is also known:
- (i) The sum of prices per share of company Q on six days is 1 more than that of company P. Worth index of company R is same for three days.
  - (ii) Total worth index of the four companies on the six days i.e., from Monday to Saturday is 140, 184, 213, 248, 240 and 258, in that order. For company Q, the sum of worth indices is 87 for two pairs of days.
  - (iii) Only one company has a worth index equal to or less than 50 on Friday. Share prices on Saturday are even numbers for three companies.

Q.41

On which of the following days does the worth index of a company and share price of another company is same?

1

☐

Thursday

2

☐

Saturday

3

☐

Tuesday

4

☐

Both (2) and (3)

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Answer key/Solution

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

The table given below depicts the partial information about the prices (in Rupees) of a share in four different companies – P, Q, R, and S – on six days i.e., Monday to Saturday of a week. The price of that share is always more than Rs. 50 but less than Rs. 100. No two companies have same share price on the same day. Worth index, an integral value, of a company on a day can be calculated using the price of the share in the company on that day by the given formula:

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Serial number of the days are as 1, 2, 3, ..., 6 for Monday, Tuesday, Wednesday, ..., Saturday respectively.

Company \ Day	P	Q	R	S
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- (i) The sum of prices per share of company Q on six days is 1 more than that of company P. Worth index of company R is same for three days.
  - (ii) Total worth index of the four companies on the six days i.e., from Monday to Saturday is 140, 184, 213, 248, 240 and 258, in that order. For company Q, the sum of worth indices is 87 for two pairs of days.
  - (iii) Only one company has a worth index equal to or less than 50 on Friday. Share prices on Saturday are even numbers for three companies.

Q.42  
The absolute difference between the total worth indices of company R and company S is

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Answer key/Solution

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

During Navratri, six persons living in Galaxy apartments distributed different chocolates – Perk, Kitkat, Patchi, Dairy Milk, Cadbury, and Mars – to each other such that the chocolates distributed by any two persons will not be of the same kind. The apartment has 2 blocks – I and II. In block I, there is a building with three flats – A, B, and C and in block II, another building has three flats – P, Q, and R which are located on the 1st, 2nd and 3rd floors respectively. The first name of these six persons are – Era, Navdeep, Rohit, Sita, Vaibhavi and Vijay in any order. Their surnames are Gupta, Jindal, Kohli, Mehta, Singh, and Sharma not necessarily in this order.

- 1. Navdeep is not the resident who gave Perk.
- 2. Rohit’s floor is immediately above Gupta’s floor.
- 3. The person who distributed Dairymilk chocolates lives in the apartment immediately above Navdeep.
- 4. Singh is not the resident of the building in which the person who distributed Patchi lives.
- 5. Era’s floor is immediately above the floor on which the person who distributed Cadbury lives.
- 6. Sharma and the person who distributed Kitkat live on the same floor.
- 7. Kohli does not live in flat P.
- 8. The person who distributed Perk lives immediately above Vijay’s flat.
- 9. Era, who is not Gupta, did not distribute Dairymilk.
- 10. Sita, who does not live on the 3rd floor, distributed Mars.
- 11. Vaibhavi is not Mehta and Mehta lives immediately below Jindal in the same building.
- 12. Neither Vijay nor Rohit distributed Cadbury.

Q.43  
Which chocolate was distributed by Rohit?

1 ☐ Perk

2 ☐ Kitkat

3 ☐ Dairymilk

4 ☐ Patchi

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 Answer key/Solution

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

During Navratri, six persons living in Galaxy apartments distributed different chocolates – Perk, Kitkat, Patchi, Dairy Milk, Cadbury, and Mars – to each other such that the chocolates distributed by any two persons will not be of the same kind. The apartment has 2 blocks – I and II. In block I, there is a building with three flats – A, B, and C and in block II, another building has three flats – P, Q, and R which are located on the 1st, 2nd and 3rd floors respectively. The first name of these six persons are – Era, Navdeep, Rohit, Sita, Vaibhavi and Vijay in any order. Their surnames are Gupta, Jindal, Kohli, Mehta, Singh, and Sharma not necessarily in this order.

- 1. Navdeep is not the resident who gave Perk.
- 2. Rohit’s floor is immediately above Gupta’s floor.
- 3. The person who distributed Dairymilk chocolates lives in the apartment immediately above Navdeep.
- 4. Singh is not the resident of the building in which the person who distributed Patchi lives.
- 5. Era’s floor is immediately above the floor on which the person who distributed Cadbury lives.
- 6. Sharma and the person who distributed Kitkat live on the same floor.
- 7. Kohli does not live in flat P.
- 8. The person who distributed Perk lives immediately above Vijay’s flat.
- 9. Era, who is not Gupta, did not distribute Dairymilk.
- 10. Sita, who does not live on the 3rd floor, distributed Mars.
- 11. Vaibhavi is not Mehta and Mehta lives immediately below Jindal in the same building.
- 12. Neither Vijay nor Rohit distributed Cadbury.

Q.44  
What is the surname of Vaibhavi?

- 1 ☐ Sharma
- 2 ☐ Jindal
- 3 ☐ Gupta
- 4 ☐ Singh

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 **Answer key/Solution**

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

During Navratri, six persons living in Galaxy apartments distributed different chocolates – Perk, Kitkat, Patchi, Dairy Milk, Cadbury, and Mars – to each other such that the chocolates distributed by any two persons will not be of the same kind. The apartment has 2 blocks – I and II. In block I, there is a building with three flats – A, B, and C and in block II, another building has three flats – P, Q, and R which are located on the 1st, 2nd and 3rd floors respectively. The first name of these six persons are – Era, Navdeep, Rohit, Sita, Vaibhavi and Vijay in any order. Their surnames are Gupta, Jindal, Kohli, Mehta, Singh, and Sharma not necessarily in this order.

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- 2. Rohit’s floor is immediately above Gupta’s floor.
- 3. The person who distributed Dairymilk chocolates lives in the apartment immediately above Navdeep.
- 4. Singh is not the resident of the building in which the person who distributed Patchi lives.
- 5. Era’s floor is immediately above the floor on which the person who distributed Cadbury lives.
- 6. Sharma and the person who distributed Kitkat live on the same floor.
- 7. Kohli does not live in flat P.
- 8. The person who distributed Perk lives immediately above Vijay’s flat.
- 9. Era, who is not Gupta, did not distribute Dairymilk.
- 10. Sita, who does not live on the 3rd floor, distributed Mars.
- 11. Vaibhavi is not Mehta and Mehta lives immediately below Jindal in the same building.
- 12. Neither Vijay nor Rohit distributed Cadbury.

Q.45  
In which apartment does Era live?

1 ☐ A

2 ☐ B

3 ☐ Q

4 ☐ R

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 Answer key/Solution

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

During Navratri, six persons living in Galaxy apartments distributed different chocolates – Perk, Kitkat, Patchi, Dairy Milk, Cadbury, and Mars – to each other such that the chocolates distributed by any two persons will not be of the same kind. The apartment has 2 blocks – I and II. In block I, there is a building with three flats – A, B, and C and in block II, another building has three flats – P, Q, and R which are located on the 1st, 2nd and 3rd floors respectively. The first name of these six persons are – Era, Navdeep, Rohit, Sita, Vaibhavi and Vijay in any order. Their surnames are Gupta, Jindal, Kohli, Mehta, Singh, and Sharma not necessarily in this order.

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- 5. Era’s floor is immediately above the floor on which the person who distributed Cadbury lives.
- 6. Sharma and the person who distributed Kitkat live on the same floor.
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- 8. The person who distributed Perk lives immediately above Vijay’s flat.
- 9. Era, who is not Gupta, did not distribute Dairymilk.
- 10. Sita, who does not live on the 3rd floor, distributed Mars.
- 11. Vaibhavi is not Mehta and Mehta lives immediately below Jindal in the same building.
- 12. Neither Vijay nor Rohit distributed Cadbury.

Q.46  
Which of the following name and Surname is correct pair?

- 1 ☐ Era Singh
- 2 ☐ Vijay Sharma
- 3 ☐ Navdeep Gupta
- 4 ☐ Sita Jindal

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 Answer key/Solution

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

Akshat, a creative game maker, is planning to make a learning mathematical game for kids. The game is created to teach kids about the rectangular shape. For that, a grid is made having dimension  $m \times n$ . Now, one needs to divide this grid into smaller rectangles and then write a number in any one cell of that rectangle where that number denotes the number of cells, of the grid, used to make that particular rectangle. Also, every cell must be used in this process. For example, let us make a grid of dimension  $3 \times 3$ . Then one of the many ways to divide it in rectangles is as shown below:

4		2
1	2	



Q.47

In how many ways the rectangles can be formed, in a grid of dimension  $p \times q$ , containing numbers 4, 3, and 2 only such that the value of  $(p + q)$  is the least possible?

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Answer key/Solution

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

Akshat, a creative game maker, is planning to make a learning mathematical game for kids. The game is created to teach kids about the rectangular shape. For that, a grid is made having dimension  $m \times n$ . Now, one needs to divide this grid into smaller rectangles and then write a number in any one cell of that rectangle where that number denotes the number of cells, of the grid, used to make that particular rectangle. Also, every cell must be used in this process. For example, let us make a grid of dimension  $3 \times 3$ . Then one of the many ways to divide it in rectangles is as shown below:

4		2
1	2	

Q.48

A grid of dimension  $4 \times 5$  is filled with exactly 3 single digit numbers - A, B and C, and a grid of dimension  $4 \times 4$  is filled with exactly 4 single digit numbers - P, Q, R and S such that ABC and PQRS thus formed are the highest numbers possible. What is the value of  $B + P + S$ ?

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Answer key/Solution

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

Akshat, a creative game maker, is planning to make a learning mathematical game for kids. The game is created to teach kids about the rectangular shape. For that, a grid is made having dimension  $m \times n$ . Now, one needs to divide this grid into smaller rectangles and then write a number in any one cell of that rectangle where that number denotes the number of cells, of the grid, used to make that particular rectangle. Also, every cell must be used in this process. For example, let us make a grid of dimension  $3 \times 3$ . Then one of the many ways to divide it in rectangles is as shown below:

4		2
1	2	

Q.49

				1
4				
		6		

The empty cells in the above shown grid have to be filled with exactly one six and combinations of 1's and 2's. In how many ways can this grid be filled?

- 1 ☐ 27
- 2 ☐ 57
- 3 ☐ 56
- 4 ☐ None of these

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 Answer key/Solution

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

Akshat, a creative game maker, is planning to make a learning mathematical game for kids. The game is created to teach kids about the rectangular shape. For that, a grid is made having dimension  $m \times n$ . Now, one needs to divide this grid into smaller rectangles and then write a number in any one cell of that rectangle where that number denotes the number of cells, of the grid, used to make that particular rectangle. Also, every cell must be used in this process. For example, let us make a grid of dimension  $3 \times 3$ . Then one of the many ways to divide it in rectangles is as shown below:

4		2
1	2	

Q.50

4				4	
			5		
				4	
2					

The empty cells in the grid shown above have to be filled with 5 consecutive numbers, with repetition. In how many ways can this grid be filled?

- 1 ☐ 20

2 ☐ 22

3 ☐ 30

4 ☐ None of these

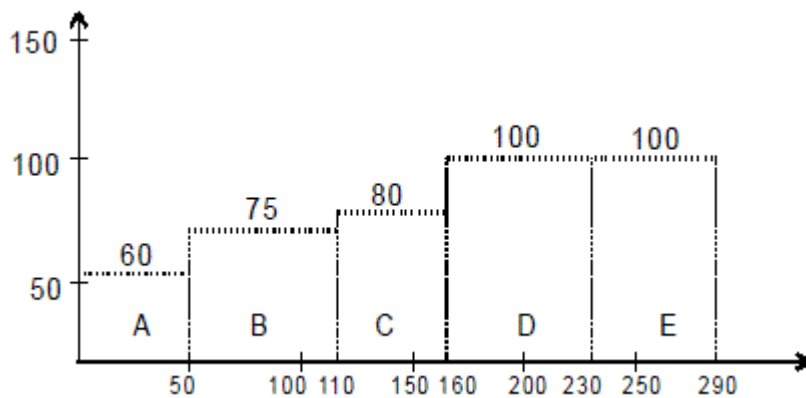
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 Answer key/Solution

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

Five products - A, B, C, D, and E - are manufactured by a company where currency (in PoP) is available in denomination of 500 only. Total manufacturing cost of a product varies from 6000 PoP to 9000 PoP, includes hardware cost, software cost, and marketing cost. Marketing of a product can be done in at least one layer and at most three layers and each layer cost 500 PoP. Total manufacturing cost of all five products taken together is 38500 PoP. Software cost of a product is always greater than or equal to its marketing cost while the hardware cost of each of the five products can be calculated using the below shown bar graph and the formula written below it:



Hardware cost of product B =  $(110 - 50) \times 75 = 4500$  PoP

The additional information, as written below, is also known:

- (I) The total manufacturing cost of product B, C and D are in the ratio of 3 : 2 : 3 and that of product A is less than that of product E.
- (II) Software cost of all products taken together and marketing cost of all products taken together are in the ratio of 19 : 9.
- (III) Two products have same software cost and one out of these two have same hardware cost as that of software cost.
- (IV) Software cost of product D is less than that of C.

Q.51

Marketing cost of product E is

1 ☐ 500 PoP

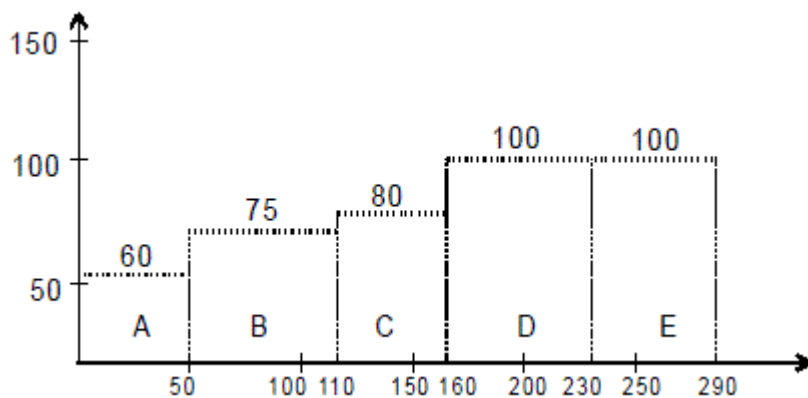
2 ☐ 1000 PoP

3 ☐ 1500 PoP

4 ☐ Either (1) or (2).

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

Five products - A, B, C, D and E - are manufactured by a company where currency (in PoP) is available in denomination of 500 only. Total manufacturing cost of a product, varies from 6000 PoP to 9000 PoP, includes hardware cost, software cost and marketing cost. Marketing of a product can be done in at least one layer and at most three layers and each layer costs 500 PoP. Total manufacturing cost of all five products taken together is 38500 PoP. Software cost of a product is always greater than or equal to its marketing cost while the hardware cost of each of the five products can be calculated using the below shown bar graph and the formula written below it:



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- (II) Software cost of all products taken together and marketing cost of all products taken together are in the ratio of 19 : 9.
- (III) Two products have same software cost and one out of these two have same hardware cost as that of software cost.
- (IV) Software cost of product D is less than that of C.

Q.52

If each product is sold at 10000 PoP, then the number of products on which a profit of 25% is earned is

[NOTE:- Profit calculated on total manufacturing cost]

1 ☐ 2

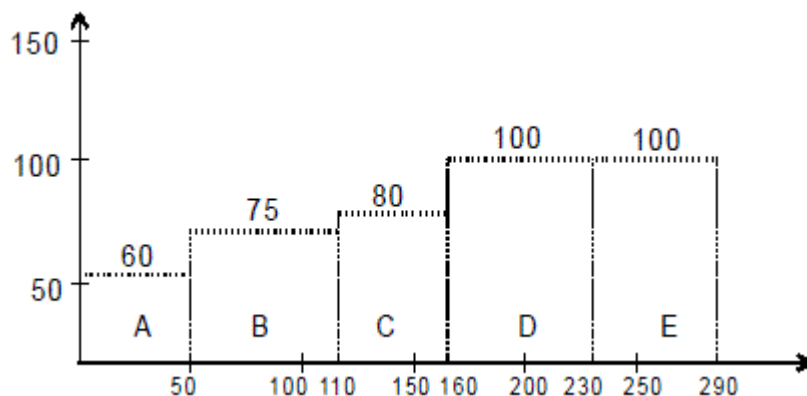
2 ☐ 1

3 ☐ 0

4 ☐ Either (2) or (3)

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

Five products - A, B, C, D and E - are manufactured by a company where currency (in PoP) is available in denomination of 500 only. Total manufacturing cost of a product, varies from 6000 PoP to 9000 PoP, includes hardware cost, software cost and marketing cost. Marketing of a product can be done in at least one layer and at most three layers and each layer costs 500 PoP. Total manufacturing cost of all five products taken together is 38500 PoP. Software cost of a product is always greater than or equal to its marketing cost while the hardware cost of each of the five products can be calculated using the below shown bar graph and the formula written below it:



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- (II) Software cost of all products taken together and marketing cost of all products taken together are in the ratio of 19 : 9.
- (III) Two products have same software cost and one out of these two have same hardware cost as that of software cost.
- (IV) Software cost of product D is less than that of C.

Q.53

Which of the following statements is/are true?

- (I) Hardware cost of product D is 700% more than its marketing cost.
- (II) There may be exactly 2 products for which software cost is double of marketing cost.
- (III) The minimum possible difference between hardware cost and marketing cost of a product is 2000 PoP.

1 ☐ I and III

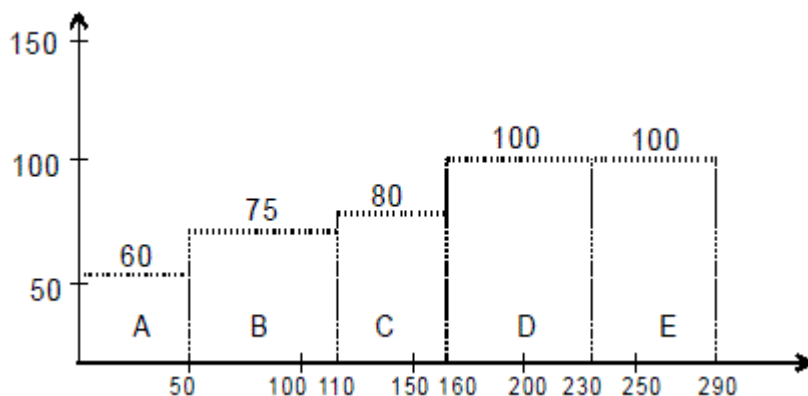
2 ☐ II and III

3 ☐ I and II

4 ☐ All I, II and III

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

Five products - A, B, C, D and E - are manufactured by a company where currency (in PoP) is available in denomination of 500 only. Total manufacturing cost of a product, varies from 6000 PoP to 9000 PoP, includes hardware cost, software cost and marketing cost. Marketing of a product can be done in at least one layer and at most three layers and each layer costs 500 PoP. Total manufacturing cost of all five products taken together is 38500 PoP. Software cost of a product is always greater than or equal to its marketing cost while the hardware cost of each of the five products can be calculated using the below shown bar graph and the formula written below it:



Hardware cost of product B =  $(110 - 50) \times 75 = 4500$  PoP

The additional information, as written below, is also known:

- (I) The total manufacturing cost of product B, C and D are in the ratio of 3 : 2 : 3 and that of product A is less than that of product E.
- (II) Software cost of all products taken together and marketing cost of all products taken together are in the ratio of 19 : 9.
- (III) Two products have same software cost and one out of these two have same hardware cost as that of software cost.
- (IV) Software cost of product D is less than that of C.

Q.54

Which of the following products cannot be processed in two layer marketing?

1 ☐ A

2 ☐ C

3 ☐ D

4 ☐ E

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

Dr. Chitra Gupta has been tracking the number of scholars who are mentioning her research paper in their thesis work for consecutive three weeks. She has been noting down following data i.e., educational fields these scholars belong to and the university they are working in two tables:

Table 1

University	Week		
	1st	2nd	3rd
DU	1	0	0
Xavier's	2	0	0
Indraprastha	0	1	0
Central	0	0	2
Amity	1	0	0
NLU	1	0	1
SU	2	0	0
Tez bahadur	0	2	0

Table 2

Educational Fields	Week		
	1st	2nd	3rd
Forensic	2	0	0
Genetics	1	1	0
Biostatics	1	2	0
Pharmaceuticals	2	0	2
Astronomy	1	0	1

Table 1 shows the number of scholar from different university and table 2 shows the number of scholars from different educational fields.

Additional Information known to us:

- 1. Central University did not have Astronomy department and Xavier's, SU, and Tez Bahadur University did not have Genetics and Astronomy Department.
- 2. Scholars from DU and Amity did not belong to the educational field of Forensic and Pharmaceuticals.
- 3. In NLU, scholars who mentioned the name of Dr. Chitra Gupta in their thesis belonged to exactly one educational field.

Q.55  
To which Educational field scholar from Amity belong?

- 1 ☐ Biostatics or Genetics but not Astronomy
- 2 ☐ Biostatics or Astronomy but not Genetics
- 3 ☐ Genetics or Astronomy but not Biostatics
- 4 ☐ Biostatics or Astronomy but not Pharmaceuticals

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 Answer key/Solution

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

Dr. Chitra Gupta has been tracking the number of scholars who are mentioning her research paper in their thesis work for consecutive three weeks. She has been noting down following data i.e., educational fields these scholars belong to and the university they are working in two tables:

Table 1

	Week		
University	1st	2nd	3rd
DU	1	0	0
Xavier's	2	0	0
Indraprastha	0	1	0
Central	0	0	2
Amity	1	0	0
NLU	1	0	1
SU	2	0	0
Tez bahadur	0	2	0

Table 2

	Week		
Educational Fields	1st	2nd	3rd
Forensic	2	0	0
Genetics	1	1	0
Biostatics	1	2	0
Pharmaceuticals	2	0	2
Astronomy	1	0	1

Table 1 shows the number of scholar from different university and table 2 shows the number of scholars from different educational fields.

Additional Information known to us:

- 1. Central University did not have Astronomy department and Xavier's, SU, and Tez Bahadur University did not have Genetics and Astronomy Department.
- 2. Scholars from DU and Amity did not belong to the educational field of Forensic and Pharmaceuticals.
- 3. In NLU, scholars who mentioned the name of Dr. Chitra Gupta in their thesis belonged to exactly one educational field.

Q.56  
If both scholars from Xavier's belongs to the educational field of forensic, then to which educational field did the scholar of SU belong?

- 1 ☐ Pharmaceuticals and Biostatics
- 2 ☐ Only Pharmaceuticals
- 3 ☐ Forensic and Biostatic
- 4 ☐ Cannot be determined

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 Answer key/Solution



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

Dr. Chitra Gupta has been tracking the number of scholars who are mentioning her research paper in their thesis work for consecutive three weeks. She has been noting down following data i.e., educational fields these scholars belong to and the university they are working in two tables:

Table 1

	Week		
University	1st	2nd	3rd
DU	1	0	0
Xavier's	2	0	0
Indraprastha	0	1	0
Central	0	0	2
Amity	1	0	0
NLU	1	0	1
SU	2	0	0
Tez bahadur	0	2	0

Table 2

	Week		
Educational Fields	1st	2nd	3rd
Forensic	2	0	0
Genetics	1	1	0
Biostatics	1	2	0
Pharmaceuticals	2	0	2
Astronomy	1	0	1

Table 1 shows the number of scholar from different university and table 2 shows the number of scholars from different educational fields.


Additional Information known to us:


- 1. Central University did not have Astronomy department and Xavier's, SU, and Tez Bahadur University did not have Genetics and Astronomy Department.
- 2. Scholars from DU and Amity did not belong to the educational field of Forensic and Pharmaceuticals.
- 3. In NLU, scholars who mentioned the name of Dr. Chitra Gupta in their thesis belonged to exactly one educational field.

Q.57  
Which among the listed educational fields can possibly belong to a scholar of three of the eight listed universities?

- 1 ☐ None
- 2 ☐ Only Pharmaceuticals
- 3 ☐ Only Biostatics
- 4 ☐ Both Biostatics and Pharmaceuticals

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 **Answer key/Solution**

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

Dr. Chitra Gupta has been tracking the number of scholars who are mentioning her research paper in their thesis work for consecutive three weeks. She has been noting down following data i.e., educational fields these scholars belong to and the university they are working in two tables:

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	Week		
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Xavier's	2	0	0
Indraprastha	0	1	0
Central	0	0	2
Amity	1	0	0
NLU	1	0	1
SU	2	0	0
Tez bahadur	0	2	0

Table 2

	Week		
Educational Fields	1st	2nd	3rd
Forensic	2	0	0
Genetics	1	1	0
Biostatics	1	2	0
Pharmaceuticals	2	0	2
Astronomy	1	0	1

Table 1 shows the number of scholar from different university and table 2 shows the number of scholars from different educational fields.

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- 1. Central University did not have Astronomy department and Xavier's, SU, and Tez Bahadur University did not have Genetics and Astronomy Department.
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- 3. In NLU, scholars who mentioned the name of Dr. Chitra Gupta in their thesis belonged to exactly one educational field.

**Q.58**  
Scholars from how many universities from Pharmaceuticals field mentioned Dr. Chitra Gupta's research paper in three weeks?

- 1 ☐ 1
- 2 ☐ 2
- 3 ☐ 3
- 4 ☐ Either 2 or 3

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 **Answer key/Solution**

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

In a batch of 2019 in IIMA, a B-school, there are 450 students, out of which 330 are boys and 120 are girls. Each student opted for atleast one of the 3 major courses-HR, Marketing and Finance and no student opted for all the 3 courses. The number of students who opted for HR, Marketing and Finance are 220, 280 and 170 respectively. Further, out of 450 students, 350 students play Football, 325 students play Cricket and 250 students play Tennis, such that each student plays atleast one game. No student who played both Cricket and Football opted for HR and 25% of all the students who opted for only Marketing are boys.

Q.59  
What can be the maximum number of students who play all 3 sports?

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Answer key/Solution

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

In a batch of 2019 in IIMA, a B-school, there are 450 students, out of which 330 are boys and 120 are girls. Each student opted for atleast one of the 3 major courses-HR, Marketing and Finance and no student opted for all the 3 courses. The number of students who opted for HR, Marketing and Finance are 220, 280 and 170 respectively. Further, out of 450 students, 350 students play Football, 325 students play Cricket and 250 students play Tennis, such that each student plays atleast one game. No student who played both Cricket and Football opted for HR and 25% of all the students who opted for only Marketing are boys.

Q.60  
If the number of students opting for both marketing and finance is maximum possible, then what can be the maximum number of girls who opted for only marketing?

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Answer key/Solution

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

In a batch of 2019 in IIMA, a B-school, there are 450 students, out of which 330 are boys and 120 are girls. Each student opted for atleast one of the 3 major courses-HR, Marketing and Finance and no student opted for all the 3 courses. The number of students who opted for HR, Marketing and Finance are 220, 280 and 170 respectively. Further, out of 450 students, 350 students play Football, 325 students play Cricket and 250 students play Tennis, such that each student plays atleast one game. No student who played both Cricket and Football opted for HR and 25% of all the students who opted for only Marketing are boys.

Q.61  
What can be the maximum number of students who opted for Marketing and Finance and play cricket only, if the number of students playing all 3 sports is maximum possible?

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

In a batch of 2019 in IIMA, a B-school, there are 450 students, out of which 330 are boys and 120 are girls. Each student opted for atleast one of the 3 major courses-HR, Marketing and Finance and no student opted for all the 3 courses. The number of students who opted for HR, Marketing and Finance are 220, 280 and 170 respectively. Further, out of 450 students, 350 students play Football, 325 students play Cricket and 250 students play Tennis, such that each student plays atleast one game. No student who played both Cricket and Football opted for HR and 25% of all the students who opted for only Marketing are boys.

Q.62

If the number of students who play Cricket and Football but not Tennis is maximum possible, then what can be the minimum number of students who opted for HR and play football?

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

The Indian Premier league (IPL) is currently contested by eight teams. Based on the performance of the players during the previous years and the team selection, there were five favorite teams during the recent season - KKR, KXI, CSK, MI and RCB - not necessarily in this order.

For professional gamblers, the IPL season is the most lucrative time of the year. There are several mobile applications available, through which a gambler can place his bets. Each application has its own rules and regulations. Jignesh is an avid gambler and he chooses to place his bets through Crik-Trik app. According to the rules of this app, bets can be placed only in multiples of Rs.1,000. The bet placed on the winning team brings you thrice the amount in return and that placed on the team in the second position brings you twice the amount in return whereas the bet placed on the team in the third position is returned as it is. The bets placed on the teams in the fourth and fifth positions are lost. At the end of the IPL season CSK emerge as the winners. During the season Jignesh had a total amount of Rs.11,000 which was divided into three parts - x, y and z - and bets were placed on different teams.

Q.63

If Jignesh had placed the maximum amount on CSK and at the end he gained exactly 100%, then which of the following conditions may be true?

- I. The other two teams on which the bets are placed are at 2nd and 5th positions.
- II. The other two teams on which the bets are placed are at 4th and 5th positions.
- III. The other two teams on which the bets are placed are at 3rd and 4th positions.

1 ☐ Only I may be true

2 ☐ Only II may be true

3 ☐ Both I and III may be true

4 ☐ Both II and III may be true

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 Answer key/Solution

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

The Indian Premier league (IPL) is currently contested by eight teams. Based on the performance of the players during the previous years and the team selection, there were five favorite teams during the recent season - KKR, KXI, CSK, MI and RCB - not necessarily in this order.

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Q.64

The total amount is split into three parts - Rs.x, Rs.y and Rs.z - which are in descending order. Jignesh places Rs.x on KKR, Rs.y on CSK and Rs.z on MI. If RCB was at 4th position, then which of the following may be true for Jignesh to have no profit and no loss from the bet placed?

I. MI is either at 2nd position or 3rd position

II. MI is at 5th position

III. KKR is at 2nd or 3rd positions

1 ☐ Only I may be true

2 ☐ Only II may be true

3 ☐ Both I and III may be true

4 ☐ Both II and III may be true

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 Answer key/Solution

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

The Indian Premier league (IPL) is currently contested by eight teams. Based on the performance of the players during the previous years and the team selection, there were five favorite teams during the recent season - KKR, KXI, CSK, MI and RCB - not necessarily in this order.

For professional gamblers, the IPL season is the most lucrative time of the year. There are several mobile applications available, through which a gambler can place his bets. Each application has its own rules and regulations. Jignesh is an avid gambler and he chooses to place his bets through Crik-Trik app. According to the rules of this app, bets can be placed only in multiples of Rs.1,000. The bet placed on the winning team brings you thrice the amount in return and that placed on the team in the second position brings you twice the amount in return whereas the bet placed on the team in the third position is returned as it is. The bets placed on the teams in the fourth and fifth positions are lost. At the end of the IPL season CSK emerge as the winners. During the season Jignesh had a total amount of Rs.11,000 which was divided into three parts - x, y and z - and bets were placed on different teams.

**Q.65**

What is the difference between the maximum and minimum amount (in Rs.) that could possibly be received at the end as returns from the bets placed by Jignesh?

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 Answer key/Solution

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

The Indian Premier league (IPL) is currently contested by eight teams. Based on the performance of the players during the previous years and the team selection, there were five favorite teams during the recent season - KKR, KXI, CSK, MI and RCB - not necessarily in this order.

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**Q.66**

Jignesh divides his total amount into three parts - Rs.x, Rs.y and Rs.z - such that Rs.y is equal to Rs.z. He places a bet of Rs.x on MI, Rs.y on RCB and Rs.z on KXI respectively and none of them is at 5th position. If there was no profit and no loss in this bet made by him, then which of the following is definitely true?

- 1 ☐ MI is at second position
- 2 ☐ MI is at third position
- 3 ☐ RCB is at second position
- 4 ☐ KXI is at third position

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 Answer key/Solution

## Sec 3

Q.67

By selling  $x$  pens, a shopkeeper loses the selling price of  $y$  pens. If the shopkeeper had less than 100 pens and his loss percentage was 15%, then the number of values that  $x$  can take is

1 ☐ 3

2 ☐ 5

3 ☐ 6

4 ☐ 7

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 Answer key/Solution

Q.68

Metros are running each hour from Delhi to Gurugram and from Gurugram to Delhi. First metro starts at 6 a.m. and time taken by each metro to reach another station is 4.5 hours. If you start your journey from Delhi at 12 noon, how many metros will you cross till Gurugram? (Note:- Speed of all metros is same.)

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 Answer key/Solution

Q.69

Let  $X$  be a two digit number such that both  $X$  and  $X^2$  end with the same digit and none of the digits in  $X$  equals zero. When the digits of  $X$  are written in the reversed order, the square of the new number so obtained has last digit as 6 and is less than 3000. Then the number of distinct possibilities for  $X$  is

1 ☐ 3

2 ☐ 6

3 ☐ 8

4 ☐ None of these

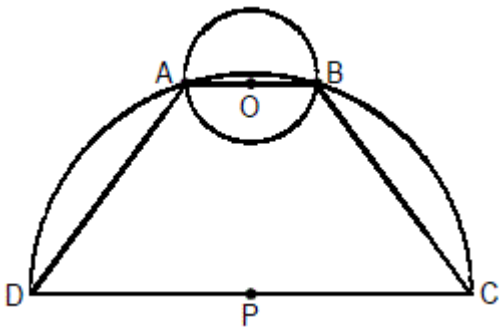
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 Answer key/Solution

Q.70

In the given figure, the length of chords AD and BC of semicircle with centre P is 6 cm each. The length of DC is 10 cm. Find the area (in sq. cm) of circle with centre 'O'. (Take  $\pi = 3.14$ )



1 ☐ 7.18


2 ☐ 6.15

3 ☐ 5.24

4 ☐ 8.31

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 Answer key/Solution

Q.71

The sum of 8 consecutive numbers can also be written as the sum of 5 consecutive numbers. If all these numbers are two digit numbers, then what is the largest possible value of the number in the first series?

1 ☐ 26

2 ☐ 46

3 ☐ 61

4 ☐ 51



[FeedBack](#)[Bookmark](#)[Answer key/Solution](#)**Q.72**

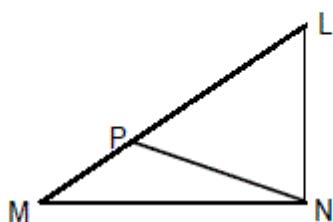
Sambhu sent his assistant to buy some apples, bananas and hot-dogs for his friends. He instructed him to buy a minimum of 3 apples, 12 bananas and 3 hot-dogs. His assistant bought the maximum possible number of apples. How many bananas were purchased by him if a total of Rs. 312 was spent and each apple costs Rs. 21, each banana costs Rs. 7 and each hot-dog costs Rs. 26?

[FeedBack](#)[Bookmark](#)[Answer key/Solution](#)**Q.73**

38 workers of a group having equal efficiencies can build a wooden bridge in 12 days by working together for 6 hours daily. Find the number of days in which 57 workers of second group having equal efficiencies can do twice the work if working 8 hours daily. Assume that any 2 workers of the first group work as much in 1 hour as any 3 workers of the second group do in  $1\frac{1}{2}$  hours.

[FeedBack](#)[Bookmark](#)[Answer key/Solution](#)**Q.74**

In  $\triangle LMN$ ,  $\angle LMN = 45^\circ$ . If point P is on LM such that  $LP = 2PM$  and  $\angle PNM = 15^\circ$ , then find  $(\angle NLM - \angle LNP)$ .

1 ☐ 30°2 ☐ 45°

3 ☐ 60°

4 ☐ 75°

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 Answer key/Solution

**Q.75**

Sandeep deposits a certain sum of money every year at 8% CI. After 3 years, Rs. 54,783 will be there in his account. Find the sum of money (in Rs.) which he deposits every year.

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 Answer key/Solution

**Q.76**

If the sum of two numbers X and Y is  $2\sqrt{3}$  and their difference is  $2\sqrt{2}$ , then find the value of  $(\log X + \log Y)$ .

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 Answer key/Solution

**Q.77**

Simran buys a generator for Rs. 1,00,000 and rents it. She puts 12.5% of each month's rent aside for upkeep and repair, pays Rs. 325 per year as tax and saves 5.5% of the price of the generator annually. Find the monthly rent (in Rs.).

1 ☐ 473.12

2 ☐ 623.54

3 ☐ 554.76

4 ☐ None of these

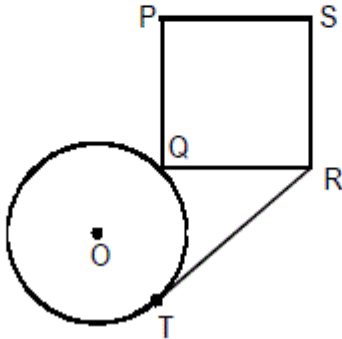
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 Answer key/Solution

Q.78

A square PQRS and a circle with center O are shown in the figure given below. Radius of the circle and the length of side of the square are both rational. The circle passes through Q, and Q lies on the line joining S and O. Point T lies on the circle, on the same side of SO as R. Segment RT is tangent to the circle, and  $RT = \sqrt{25 + 7\sqrt{2}}$ . Find the ratio of the radius of the circle and the length of side of the square.



1 ☐ 7/5

2 ☐ 5/7

3 ☐ 7/25

4 ☐ 25/7

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Answer key/Solution

Q.79

$f(x)$  is a quadratic function such that  $f(4) = 4 \times f(1)$ . If one of the roots of  $f(x) = 0$  is 2, then find the second root.

1 ☐ 0

2 ☐ 1

3 ☐ 2

4 ☐ 3

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Answer key/Solution

Q.80

The area of a rectangle is 675 sq.cm. If both the length and the breadth (in cm) of the rectangle are integers, how many such rectangles are there, for which at least one of the dimensions is not a multiple of 3 and at least one of the dimensions is not a multiple of 5?

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Answer key/Solution

Q.81

How many factors of 720 are divisible by 4 but not by 16?

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Answer key/Solution

Q.82

A country wanted to select four mixed-doubles tennis team for the upcoming Rio Olympics from 6 female players and 6 male players available for selection. If the selection panel chose the players at random, then in how many ways they could have done that? (A mixed-doubles tennis comprises one male and one female player.)

1 129600

2 64800

3 5400

4 1800

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Answer key/Solution

Q.83

If m and n are whole numbers, how many pairs {m, n} exist, such that the quadratic equation  $x^2 - (m!)x + n! = 0$  has equal roots for x?

1 0

2 1

3 ☐ 2

4 ☐ More than 2

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 Answer key/Solution

**Q.84**

Two pipes X and Y can fill a tank in 5 hours and 6 hours respectively whereas two leaks can empty it in 7 hours and 8 hours respectively. X and Y are opened at 6 a.m. and 6:30 a.m. respectively. Once the tank is 65% full, the leaks also start functioning. What is the total time taken to fill the tank?

1 ☐ 5 hours

2 ☐ 6 hours

3 ☐ 6.54 hours

4 ☐ 5.54 hours

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 Answer key/Solution

**Q.85**

A line segment PQ of length 10 cm is tangent to the inner circle of two concentric circles such that P and Q lies on the outer circle and both the circles have integral radii. Find the difference between the radii.

1 ☐ 1 cm

2 ☐ 5 cm

3 ☐ 3 cm

4 ☐ 4 cm

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 Answer key/Solution

**Q.86**

Find the sum  $0.36 + 0.3636 + 0.363636 + 0.363636 \dots$  upto  $n$  terms.

1 ☐

$$\frac{4}{11} \left[ n - \frac{1 - \frac{1}{100^n}}{99} \right]$$

2 ☐

$$\frac{4}{11} \left[ n + \frac{1 + \frac{1}{100^n}}{99} \right]$$

3 ☐

$$\frac{7}{11} \left[ n + \frac{1 - \frac{1}{100^n}}{99} \right]$$

4 ☐

$$\frac{7}{11} \left[ n - \frac{1 - \frac{1}{100^n}}{99} \right]$$

[FeedBack](#)[Bookmark](#)[Answer key/Solution](#)**Q.87**

In a university of 480 students, every student read 5 newspapers and every newspaper is read by 80 students. What is the number of newspaper?

[FeedBack](#)[Bookmark](#)[Answer key/Solution](#)**Q.88**

Total income of Amay, Bimal and Chetan is Rs. 1,230. If they spend 74%, 65% and 73% of their income respectively, then their savings are in the ratio of 13 : 7 : 18. What is the absolute difference (in Rs.) between the income of Amay and that of Chetan?

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Q.89

If  $\log(7x^2 + 5x - 2) = 0$ , then find the value of  $\log(x + 1) + \log(x^2 + 2x + 1) + \log(x^3 + 3x^2 + 3x + 1)$ .

1 ☐  $-6 \log(5x + 2)$

2 ☐  $-6 \log(7x - 2)$

3 ☐  $4 \log(4x - 3)$

4 ☐  $4 \log(3x + 5)$

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 Answer key/Solution

Q.90

In  $\Delta ABC$ , points D and E are on AC and BC respectively such that  $AD : DC = 2 : 5$  and  $BE : EC = 4 : 3$ .  $\Delta FGH$  is made by joining mid points F, G and H of sides DE, EC and DC respectively of  $\Delta DEC$ . If the area of  $\Delta FGH$  is an integer, then minimum possible area of  $\Delta ABC$  is

1 ☐ 98 units

2 ☐ 147 units

3 ☐ 196 units

4 ☐ None of these

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 Answer key/Solution

Q.91

Two vessels A and B contain two solutions of acid and water. The ratio of quantity of acid in vessels A and B is  $4 : 5$  while the ratio of quantity of water in A and B is  $8 : 9$ . The concentration of acid in vessel A is between 60% and 80%. The concentration of acid in vessel B is between

1 ☐ 70% and 79%

2 ☐ 62.5% and 81.63%

3 ☐ 65% and 78%

4 ☐ None of these

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 Answer key/Solution

Q.92

If  $x^2 + y^2 + z^2 = 4$ , where  $x, y, z$  are real numbers, then find the range of  $(xy + yz + zx)$ .

1 ☐  $[-2, 2]$

2 ☐  $[-3, 2]$

3 ☐  $[-1, 5]$

4 ☐  $[-2, 4]$

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 Answer key/Solution

Q.93

Ram started to run at 12:10 p.m. from point A towards point B, 15 km apart from A. At 12:20 p.m., Shyam started running from same point A and overtook Ram at 1:00 p.m. If Ram and Shyam had started to run at the same time from points A and B towards B and A respectively, they would have met at a point that is

1 ☐  $8\frac{1}{3}$  km from point B

2 ☐  $6\frac{1}{3}$  km from point B

3 ☐  $3\frac{1}{3}$  km from point A

4 ☐  $6\frac{1}{3}$  km from point A

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 Answer key/Solution



Q.94

A (4, 4) and B (14, 4) are two points that lie on the circle which is in the first quadrant such that the circle touches x-axis only. If the radius of the circle is a natural number then the value of r (nearest integer) is

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 Answer key/Solution

Q.95

A box contains 4 green, 5 yellow and 3 white envelopes. What is the probability that 4 yellow envelopes are drawn in 2 chances if 2 envelopes are drawn in each chance without replacement?

1 ☐ 1/66

2 ☐ 1/88

3 ☐ 1/99

4 ☐ 1/121

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 Answer key/Solution

Q.96

Efficiency of A is 3/4th of B's efficiency and B's efficiency is 80% of C's efficiency. If A takes 120 days more than that of B and C working together to finish a piece of work then in how many days will they all finish the work working together?

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 Answer key/Solution

Q.97

If  $x \in \mathbb{R} - \{-1, -3\}$  and  $y = \frac{x+2}{(x+1)(x+3)}$ , find the range of y.

1 ☐ [0, 3]

2 ☐ [-2, 5]

3 ☐ [0, 2]

4 ☐  $(-\infty, \infty)$

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 Answer key/Solution

Q.98

The average weight of a group of 'N' men is 64 kg. Three men with weights 78, 68 and 66 kg join the group and two men with weights in between 54 kg and 60 kg individually (both inclusive), leave the group. The average of the group now goes up by 2 kg. What is the average weight of the two men who left the group, if it was given that, the initial number of men in the group was a multiple of 5?

1 ☐ 58 kg

2 ☐ 55.5 kg

3 ☐ 56 kg

4 ☐ Cannot be determined

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 Answer key/Solution

Q.99

Two places P and Q are 60 km far from each other. A rabbit and a tortoise start running simultaneously from P to Q. When the rabbit is returning from Q, it meets the tortoise for the first time at a point which is 12 km far from Q. If the difference between their speeds is 15 km/hr, then the total time taken by the rabbit to cover the distance from P to Q and then from Q to P is

1 ☐ 2 hours 40 minutes

2 ☐ 3 hours 30 minutes

3 ☐ 2 hours 30 minutes

4 ☐ 3 hours 40 minutes

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 Answer key/Solution

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**Q.100**

If  $\log_5 120 + (x - 3) - 2 \log_5 (1 - 5^{x-3}) = -\log_5 (0.2 - 5^{x-4})$ , then what is the value of  $x$ ?

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 **Answer key/Solution**