

Questions

1. A glass contains 500 cc of milk and a cup contains 500 cc of water. From the glass, 150 cc of milk is transferred to the cup and mixed thoroughly. Next, 150 cc of this mixture is transferred from the cup to the glass. Now, the amount of water in the glass and the amount of milk in the cup are in the ratio:
A. 3 : 10
B. 10 : 3
C. 1 : 1
D. 10 : 13
2. Let r be a real number and $f(x) = \begin{cases} 2x - r & \text{if } x \geq r \\ r & \text{if } x < r \end{cases}$. Then, the equation $f(x) = f(f(x))$ holds for all real values of x where:
A. $x \neq r$
B. $x > r$
C. $x \geq r$
D. $x \leq r$
3. Consider six distinct natural numbers such that the average of the two smallest numbers is 14, and the average of the two largest numbers is 28. What is the maximum possible value of the average of these six numbers?
A. 24
B. 23.5
C. 23
D. 22.5
4. What is the minimum possible value of $\frac{x^2 - 6x + 10}{3 - x}$, for $x < 3$?
A. 2
B. $1/2$
C. -2
D. $-1/2$
5. The average of all 3-digit terms in the arithmetic progression 38, 55, 72, ..., is
6. If $c = \frac{16x}{y} + \frac{49y}{x}$ for some non-zero real numbers x and y , then c cannot take which of the following values?
A. -50
B. -70
C. -60
D. 60
7. Suppose, the medians BD and CE of triangle ABC intersect at a point O. If the area of triangle ABC is 108 sq cm, then what is the area of triangle EOD, in sq cm?
8. In triangle ABC, $AB = AC = 8$ cm. A circle drawn with BC as the diameter passes through A. Another circle drawn with the centre at A passes through B and C. What is the area, in sq cm, of the overlapping region between the two circles?
A.
B. $16(\pi - 1)$
C. 16π
D. $32(\pi - 1)$

9. A school has less than 5000 students. If the students are divided equally into teams of either 9 or 10 or 12 or 25 each, exactly 4 are always left out. However, if they are divided into teams of 11 each, no one is left out. What is the maximum number of teams of 12 each that the students of the school can be divided into?
10. What is the arithmetic mean of all the distinct numbers that can be obtained by rearranging the digits in 1421, including itself?
- A. 3333
B. 2442
C. 2222
D. 2592
11. Two cars travel from different locations at constant speeds. After starting at the same time, they take 1.5 hours to meet each other if they travel towards each other and 10.5 hours if they travel in the same direction. If the speed of the slower car is 60 km/h, then what is the distance travelled, in km, by the slower car when it meets the other car while travelling towards each other?
- A. 120
B. 150
C. 100
D. 90
12. Bob can finish a job in 40 days if he works alone. Alex is twice as fast as Bob and thrice as fast as Cole in the same job. Suppose, Alex and Bob work together on the first day, Bob and Cole work together on the second day, Cole and Alex work together on the third day, and then, they continue the work by repeating this three-day roster with Alex and Bob working together on the fourth day, and so on. What is the total number of days that Alex would have worked when the job gets finished?
13. Moody takes 30 seconds to finish riding an escalator if he walks on it at his normal speed in the same direction. He takes 20 seconds to finish riding the escalator if he walks at twice his normal speed in the same direction. If Moody decides to stand still on the escalator, then the time, in seconds, needed to finish riding the escalator is:
14. A group of N people worked on a project. They finished 35% of the project by working 7 hours a day for 10 days. Therefore, 10 people left the group and the remaining people finished the rest of the project in 14 days by working 10 hours a day. What is the value of N ?
- A. 150
B. 36
C. 23
D. 140
15. If $(\sqrt{\frac{7}{5}})^{3x-y} = \frac{875}{2401}$ and $(\frac{4a}{b})^{6x-y} = (\frac{2a}{b})^{y-6x}$, for all non-zero real values of a and b , then what is the value of $x + y$?
16. Two ships are approaching a port along straight routes at constant speeds. Initially, the two ships and the port formed an equilateral triangle with sides of length 24 km. When the slower ship travelled 8 km, the triangle formed by the new positions of the two ships and the port became right angled. When the faster ship reaches the port, what will be the distance, in km, between the other ship and the port?
- A. 8
B. 6
C. 4
D. 12
17. Suppose k is any integer such that the equation $2x^2 + kx + 5 = 0$ has no real roots and the equation $x^2 + (k$

$-5)x + 1 = 0$ has two distinct real roots for x . Then, what is the number of possible values of k ?

- A. 7
B. 8
C. 9
D. 13

18. The lengths of all four sides of a quadrilateral are integer values. If three of its sides are of length 1 cm, 2 cm, and 4 cm, then what is the total number of possible lengths of the fourth side?

- A. 5
B. 6
C. 3
D. 4

19. If $(3 + 2\sqrt{2})$ is a root of the equation $ax^2 + bx + c = 0$ and $(4 + 2\sqrt{3})$ is a root of the equation $ay^2 + my + n = 0$, where a, b, c, m , and n are integers, then what is the value of $(\frac{b}{m} + \frac{c - 2b}{n})$?

- A. 0
B. 1
C. 3
D. 4

20. A donation box can receive only cheques of ₹100, ₹250, and ₹500. On a particular day, the donation box was found to contain exactly 100 cheques amounting to a total sum of ₹15,250. What is the maximum possible number of cheques of ₹500 that the donation box may have contained?

21. Nitu has an initial capital of ₹20,000. Out of this, she invests ₹8,000 at 5.5% in Bank A, ₹5,000 at 5.6% in Bank B, and the remaining amount at $x\%$ in Bank C, each rate being simple interest per annum. Her combined annual interest income from these investments is equal to 5% of the initial capital. If she had invested her entire initial capital in Bank C alone, then her annual interest income, in rupees, would have been:

- A. 800
B. 900
C. 1000
D. 700

22. In an examination, the average marks of students in sections A and B are 32 and 60, respectively. The number of students in section A is 10 less than that in section B. If the average marks of all the students across both the sections combined is an integer, then the difference between the maximum and minimum possible number of students in section A is:

23. The four sentences (labelled 1, 2, 3 and 4) below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

1) If I wanted to sit indoors and read, or play Sonic the Hedgehog on a red-hot Sega Mega Drive, I would often be made to feel guilty about not going outside to “enjoy it while it lasts”.

2) My mum, quite reasonably, wanted me and my sister out of the house, in the sun.

3) Tales of my mum’s idyllic-sounding childhood in the Sussex countryside, where trees were climbed by 8 am and streams navigated by lunchtime, were passed down to us like folklore.

4) To an introverted kid, that felt like a threat – and the feeling has stayed with me.

24. The four sentences (labelled 1, 2, 3 and 4) below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

- 1) The more we are able to accept that our achievements are largely out of our control, the easier it becomes to understand that our failures, and those of others, are too.
- 2) But the raft of recent books about the limits of merit is an important correction to the arrogance of contemporary entitlement and an opportunity to reassert the importance of luck, or grace, in our thinking.
- 3) Meritocracy as an organising principle is an inevitable function of a free society, as we are designed to see our achievements as worthy of reward.
- 4) And that in turn should increase our humility and the respect with which we treat our fellow citizens, helping ultimately to build a more compassionate society.

25. The four sentences (labelled 1, 2, 3 and 4) below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer:

- 1) Various industrial sectors including retail, transit systems, enterprises, educational institutions, event organizing, finance, travel etc. have now started leveraging these beacons solutions to track and communicate with their customers.
- 2) A beacon fixed on to a shop wall enables the retailer to assess the proximity of the customer, and come up with a much targeted or personalized communication like offers, discounts and combos on products in each shelf.
- 3) Smart phones or other mobile devices can capture the beacon signals, and distance can be estimated by measuring received signal strength.
- 4) Beacons are tiny and inexpensive, micro-location-based technology devices that can send radio frequency signals and notify nearby Bluetooth devices of their presence and transmit information.

26. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

To defend the sequence of alphabetisation may seem bizarre, so obvious is its application that it is hard to imagine a reference, catalogue or listing without it. But alphabetical order was not an immediate consequence of the alphabet itself. In the Middle Ages, deference for ecclesiastical tradition left scholars reluctant to categorise things according to the alphabet — to do so would be a rejection of the divine order. The rediscovery of the ancient Greek and Roman classics necessitated more efficient ways of ordering, searching and referencing texts. Government bureaucracy in the 16th and 17th centuries quickened the advance of alphabetical order, bringing with it pigeonholes, notebooks and card indexes.

A. The alphabetic order took several centuries to gain common currency because of religious beliefs and a lack of appreciation of its efficacy in the ordering of things.

B. Unlike the alphabet, once the efficacy of the alphabetic sequence became apparent to scholars and administrators, its use became widespread.

C. While adoption of the written alphabet was easily D. The ban on the use by scholars of any form of

accomplished, it took scholars several centuries to accept the alphabetic sequence as a useful tool in their work.

categorisation - but the divinely ordained one - delayed the adoption of the alphabetic sequence by several centuries.

27. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Tamsin Blanchard, curator of Fashion Open Studio, an initiative by a campaign group showcasing the work of ethical designers says, "We're all drawn to an exquisite piece of embroidery, a colourful textile or even a style of dressing that might have originated from another heritage. [But] this magpie mentality, where all of culture and history is up for grabs as 'inspiration', has accelerated since the proliferation of social media... Where once a fashion student might research the history and traditions of a particular item of clothing with care and respect, we now have a world where images are lifted from image libraries without a care for their cultural significance. It's easier than ever to steal a motif or a craft technique and transfer it on to a piece of clothing that is either mass produced or appears on a runway without credit or compensation to their original communities."

A. Copying an embroidery design or pattern of textile from native communities who own them is tantamount to stealing and they need to be compensated.

B. Cultural collaboration is the need of the hour. Beautiful design ideas of indigenous people need to be showcased and shared worldwide.

C. Media has encouraged mass production; images are copied effortlessly without care or concern for the interests of ethnic communities.

D. Taking fashion ideas from any cultural group without their consent is a form of appropriation without giving due credit, compensation, and respect.

28. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

"It does seem to me that the job of comedy is to offend, or have the potential to offend, and it cannot be drained of that potential," Rowan Atkinson said of cancel culture. "Every joke has a victim. That's the definition of a joke. Someone or something or an idea is made to look ridiculous." The Netflix star continued, "I think you've got to be very, very careful about saying what you're allowed to make jokes about. You've always got to kick up? Really?" He added, "There are lots of extremely smug and self-satisfied people in what would be deemed lower down in society, who also deserve to be pulled up. In a proper free society, you should be allowed to make jokes about absolutely anything."

A. All jokes target someone and one should be able to joke about anyone in the society, which is inconsistent with cancel culture.

B. Victims of jokes must not only be politicians and royalty, but also arrogant people from lower classes should be mentioned by comedians.

C. Every joke needs a victim and one needs to include people from lower down the society and not just the upper class.

D. Cancel culture does not understand the role and duty of comedians, which is to deride and mock everyone.

29. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: This has meant a lot of uncertainty around what a wide-scale return to office might look like in practice.

Paragraph: Bringing workers back to their desks has been a rocky road for employers and employees alike. The evolution of the pandemic has meant that best laid plans have often not materialised. ____ (1) ____ The flow of workers back into offices has been more of a trickle than a steady stream. ____ (2) ____ Yet while plenty of companies are still working through their new policies, some employees across the globe are now back at their desks, whether on a full-time or hybrid basis. ____ (3) ____ That means we're beginning to get some clarity on what return-to-office means – what's working, as well as what has yet to be settled. ____ (4) ____

A. Option 1

B. Option 2

C. Option 3

D. Option 4

30. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: When people socially learn from each other, they often learn without understanding why what they're copying—the beliefs and behaviours and technologies and know-how—works.

Paragraph: ____ (1) ____ The dual-inheritance theorysays....that inheritance is itself an evolutionary system. It has variation. What makes us a new kind of animal, and so different and successful as a species, is we rely heavily on social learning, to the point where socially acquired information is effectively a second line of inheritance, the first being our genes.... ____ (2) ____ People tend to home in on who seems to be the smartest or most successful person around, as well as what everybody seems to be doing—the majority of people have something worth learning. ____ (3) ____ When you repeat this process over time, you can get, around the world, cultural packages—beliefs or behaviours or technology or other solutions—that are adapted to the local conditions. People have different psychologies, effectively. ____ (4) ____

A. Option 1

B. Option 2

C. Option 3

D. Option 4

31. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

As software improves, the people using it become less likely to sharpen their own know-how. Applications that offer lots of prompts and tips are often to blame; simpler, less solicitous programs push people harder to think, act and learn.

Ten years ago, information scientists at Utrecht University in the Netherlands had a group of people carry out complicated analytical and planning tasks using either rudimentary software that provided no assistance or sophisticated software that offered a great deal of aid. The researchers found that the people using the simple software developed better strategies, made fewer mistakes and developed a deeper aptitude for the work. The people using the more advanced software, meanwhile, would often “aimlessly click around” when confronted with a tricky problem. The supposedly helpful software actually short-circuited their thinking and learning.

[According to] philosopher Hubert Dreyfus . . . our skills get sharper only through practice, when we use them regularly to overcome different sorts of difficult challenges. The goal of modern software, by contrast, is to ease our way through such challenges. Arduous, painstaking work is exactly what programmers are most eager to automate—after all, that is where the immediate efficiency gains tend to

lie. In other words, a fundamental tension ripples between the interests of the people doing the automation and the interests of the people doing the work.

Nevertheless, automation's scope continues to widen. With the rise of electronic health records, physicians increasingly rely on software templates to guide them through patient exams. The programs incorporate valuable checklists and alerts, but they also make medicine more routinized and formulaic—and distance doctors from their patients. . . . Harvard Medical School professor Beth Lown, in a 2012 journal article . . . warned that when doctors become “screen-driven,” following a computer's prompts rather than “the patient's narrative thread,” their thinking can become constricted. In the worst cases, they may miss important diagnostic signals. . . .

In a recent paper published in the journal *Diagnosis*, three medical researchers . . . examined the misdiagnosis of Thomas Eric Duncan, the first person to die of Ebola in the U.S., at Texas Health Presbyterian Hospital Dallas. They argue that the digital templates used by the hospital's clinicians to record patient information probably helped to induce a kind of tunnel vision. “These highly constrained tools,” the researchers write, “are optimized for data capture but at the expense of sacrificing their utility for appropriate triage and diagnosis, leading users to miss the forest for the trees.” Medical software, they write, is no “replacement for basic history-taking, examination skills, and critical thinking.” . . .

There is an alternative. In “human-centered automation,” the talents of people take precedence. . . . In this model, software plays an essential but secondary role. It takes over routine functions that a human operator has already mastered, issues alerts when unexpected situations arise, provides fresh information that expands the operator's perspective and counters the biases that often distort human thinking. The technology becomes the expert's partner, not the expert's replacement.

It can be inferred that in the Utrecht University experiment, one group of people was “aimlessly clicking around” because:

- | | |
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| A. they did not have the skill-set to address complicated tasks. | B. they wanted to avoid making mistakes. |
| C. the other group was carrying out the tasks more efficiently. | D. they were hoping that the software would help carry out the tasks. |

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From the passage, we can infer that the author is apprehensive about the use of sophisticated automation for all of the following reasons EXCEPT that:

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|--|------------------------------------|
| A. it stunts the development of its users. | B. computers could replace humans. |
| C. it stops users from exercising their minds. | D. it could mislead people. |

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In the context of the passage, all of the following can be considered examples of human-centered automation EXCEPT:

- | | |
|--|--|
| A. software that offers interpretations when requested by the human operator. | B. a smart-home system that changes the temperature as instructed by the resident. |
| C. medical software that provides optional feedback on the doctor’s analysis of the medical situation. | D. software that auto-completes text when the user writes an email. |

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In the Ebola misdiagnosis case, we can infer that doctors probably missed the forest for the trees because:

- | | |
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| A. they were led by the data processed by digital templates. | B. the data collected were not sufficient for appropriate triage. |
| C. the digital templates forced them to acquire tunnel vision. | D. they used the wrong type of digital templates for the case. |

35. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Nature has all along yielded her flesh to humans. First, we took nature’s materials as food, fibers, and shelter. Then we learned to extract raw materials from her biosphere to create our own new synthetic materials. Now Bios is yielding us her mind—we are taking her logic.

Clockwork logic—the logic of the machines—will only build simple contraptions. Truly complex systems such as a cell, a meadow, an economy, or a brain (natural or artificial) require a rigorous nontechnological

logic. We now see that no logic except bio-logic can assemble a thinking device, or even a workable system of any magnitude.

It is an astounding discovery that one can extract the logic of Bios out of biology and have something useful. Although many philosophers in the past have suspected one could abstract the laws of life and apply them elsewhere, it wasn't until the complexity of computers and human-made systems became as complicated as living things, that it was possible to prove this. It's eerie how much of life can be transferred. So far, some of the traits of the living that have successfully been transported to mechanical systems are: self-replication, self-governance, limited self-repair, mild evolution, and partial learning.

We have reason to believe yet more can be synthesized and made into something new. Yet at the same time that the logic of Bios is being imported into machines, the logic of Technos is being imported into life. The root of bioengineering is the desire to control the organic long enough to improve it. Domesticated plants and animals are examples of technos-logic applied to life. The wild aromatic root of the Queen Anne's lace weed has been fine-tuned over generations by selective herb gatherers until it has evolved into a sweet carrot of the garden; the udders of wild bovines have been selectively enlarged in a "unnatural" way to satisfy humans rather than calves. Milk cows and carrots, therefore, are human inventions as much as steam engines and gunpowder are. But milk cows and carrots are more indicative of the kind of inventions humans will make in the future: products that are grown rather than manufactured.

Genetic engineering is precisely what cattle breeders do when they select better strains of Holsteins, only bioengineers employ more precise and powerful control. While carrot and milk cow breeders had to rely on diffuse organic evolution, modern genetic engineers can use directed artificial evolution—purposeful design—which greatly accelerates improvements.

The overlap of the mechanical and the lifelike increases year by year. Part of this bionic convergence is a matter of words. The meanings of "mechanical" and "life" are both stretching until all complicated things can be perceived as machines, and all self-sustaining machines can be perceived as alive. Yet beyond semantics, two concrete trends are happening: (1) Human-made things are behaving more lifelike, and (2) Life is becoming more engineered. The apparent veil between the organic and the manufactured has crumpled to reveal that the two really are, and have always been, of one being.

The author claims that, "The apparent veil between the organic and the manufactured has crumpled to reveal that the two really are, and have always been, of one being." Which one of the following statements best expresses the point being made by the author here?

- | | |
|---|--|
| A. Organic reality has crumpled under the veil of manufacturing, rendering the apparent and the real as the same being. | B. Apparent reality and organic reality are distinguished by the fact that the former is manufactured. |
| C. The crumpling of the organic veil between apparent and manufactured reality reveals them to have the same being. | D. Scientific advances are making it increasingly difficult to distinguish between organic reality and manufactured reality. |

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Nature has all along yielded her flesh to humans. First, we took nature's materials as food, fibers, and shelter. Then we learned to extract raw materials from her biosphere to create our own new synthetic materials. Now Bios is yielding us her mind—we are taking her logic.

Clockwork logic—the logic of the machines—will only build simple contraptions. Truly complex systems such as a cell, a meadow, an economy, or a brain (natural or artificial) require a rigorous nontechnological logic. We now see that no logic except bio-logic can assemble a thinking device, or even a workable system of any magnitude.

It is an astounding discovery that one can extract the logic of Bios out of biology and have something useful. Although many philosophers in the past have suspected one could abstract the laws of life and apply them elsewhere, it wasn't until the complexity of computers and human-made systems became as complicated as living things, that it was possible to prove this. It's eerie how much of life can be transferred. So far, some of the traits of the living that have successfully been transported to mechanical systems are: self-replication, self-governance, limited self-repair, mild evolution, and partial learning.

We have reason to believe yet more can be synthesized and made into something new. Yet at the same time that the logic of Bios is being imported into machines, the logic of Technos is being imported into life. The root of bioengineering is the desire to control the organic long enough to improve it. Domesticated plants and animals are examples of technos-logic applied to life. The wild aromatic root of the Queen Anne's lace weed has been fine-tuned over generations by selective herb gatherers until it has evolved into a sweet carrot of the garden; the udders of wild bovines have been selectively enlarged in a "unnatural" way to satisfy humans rather than calves. Milk cows and carrots, therefore, are human inventions as much as steam engines and gunpowder are. But milk cows and carrots are more indicative of the kind of inventions humans will make in the future: products that are grown rather than manufactured.

Genetic engineering is precisely what cattle breeders do when they select better strains of Holsteins, only bioengineers employ more precise and powerful control. While carrot and milk cow breeders had to rely on diffuse organic evolution, modern genetic engineers can use directed artificial evolution—purposeful design—which greatly accelerates improvements.

The overlap of the mechanical and the lifelike increases year by year. Part of this bionic convergence is a matter of words. The meanings of "mechanical" and "life" are both stretching until all complicated things can be perceived as machines, and all self-sustaining machines can be perceived as alive. Yet beyond semantics, two concrete trends are happening: (1) Human-made things are behaving more lifelike, and (2) Life is becoming more engineered. The apparent veil between the organic and the manufactured has crumpled to reveal that the two really are, and have always been, of one being.

None of the following statements is implied by the arguments of the passage, EXCEPT:

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| A. the biological realm is as complex as the mechanical one; which is why the logic of Bios is being imported into machines. | B. genetic engineers and bioengineers are the same insofar as they both seek to force evolution in an artificial way. |
| C. purposeful design represents the pinnacle of scientific expertise in the service of human betterment and civilisational progress. | D. historically, philosophers have known that the laws of life can be abstracted and applied elsewhere. |

37. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

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Which one of the following sets of words/phrases best serves as keywords to the passage?

A. Complex systems; Carrots; Milk cows; Convergence; Technos-logic

B. Nature; Bios; Technos; Self-repair; Holsteins

C. Nature; Computers; Carrots; Milk cows; Genetic engineering

D. Complex systems; Bio-logic; Bioengineering; Technos-logic; Convergence

38. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Nature has all along yielded her flesh to humans. First, we took nature's materials as food, fibers, and shelter. Then we learned to extract raw materials from her biosphere to create our own new synthetic materials. Now Bios is yielding us her mind—we are taking her logic.

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The author claims that, "Part of this bionic convergence is a matter of words". Which one of the following statements best expresses the point being made by the author?

- | | |
|---|--|
| A. "Bios" and "Technos" are both convergent forms of logic, but they generate meanings about the world that are mutually exclusive. | B. "Mechanical" and "life" are words from different logical systems and are, therefore, fundamentally incompatible in meaning. |
| C. "Mechanical" and "life" were earlier seen as opposite in meaning, but the difference between the two is increasingly blurred | D. A bionic convergence indicates the meeting ground of genetic engineering and artificial intelligence. |

39. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Sociologists working in the Chicago School tradition have focused on how rapid or dramatic social change causes increases in crime. Just as Durkheim, Marx, Toennies, and other European sociologists thought that

the rapid changes produced by industrialization and urbanization produced crime and disorder, so too did the Chicago School theorists. The location of the University of Chicago provided an excellent opportunity for Park, Burgess, and McKenzie to study the social ecology of the city. Shaw and McKay found . . . that areas of the city characterized by high levels of social disorganization had higher rates of crime and delinquency.

In the 1920s and 1930s Chicago, like many American cities, experienced considerable immigration. Rapid population growth is a disorganizing influence, but growth resulting from in-migration of very different people is particularly disruptive. Chicago's in-migrants were both native-born whites and blacks from rural areas and small towns, and foreign immigrants. The heavy industry of cities like Chicago, Detroit, and Pittsburgh drew those seeking opportunities and new lives. Farmers and villagers from America's hinterland, like their European cousins of whom Durkheim wrote, moved in large numbers into cities. At the start of the twentieth century, Americans were predominately a rural population, but by the century's mid-point most lived in urban areas. The social lives of these migrants, as well as those already living in the cities they moved to, were disrupted by the differences between urban and rural life. According to social disorganization theory, until the social ecology of the "new place" can adapt, this rapid change is a criminogenic influence. But most rural migrants, and even many of the foreign immigrants to the city, looked like and eventually spoke the same language as the natives of the cities into which they moved. These similarities allowed for more rapid social integration for these migrants than was the case for African Americans and most foreign immigrants.

In these same decades America experienced what has been called "the great migration": the massive movement of African Americans out of the rural South and into northern (and some southern) cities. The scale of this migration is one of the most dramatic in human history. These migrants, unlike their white counterparts, were not integrated into the cities they now called home. In fact, most American cities at the end of the twentieth century were characterized by high levels of racial residential segregation . . . Failure to integrate these migrants, coupled with other forces of social disorganization such as crowding, poverty, and illness, caused crime rates to climb in the cities, particularly in the segregated wards and neighborhoods where the migrants were forced to live.

Foreign immigrants during this period did not look as dramatically different from the rest of the population as blacks did, but the migrants from eastern and southern Europe who came to American cities did not speak English, and were frequently Catholic, while the native born were mostly Protestant. The combination of rapid population growth with the diversity of those moving into the cities created what the Chicago School sociologists called social disorganization.

Which one of the following is not a valid inference from the passage?

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| A. The differences between urban and rural lifestyles were crucial factors in the disruption experienced by migrants to American cities. | B. According to social disorganisation theory, fast-paced social change provides fertile ground for the rapid growth of crime. |
| C. The failure to integrate in-migrants, along with social problems like poverty, was a significant reason for the rise in crime in American cities. | D. According to social disorganisation theory, the social integration of African American migrants into Chicago was slower because they were less organised. |

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The author notes that, "At the start of the twentieth century, Americans were predominately a rural population, but by the century's mid-point most lived in urban areas." Which one of the following statements, if true, does not contradict this statement?

A. Demographic transition in America in the twentieth century is strongly marked by an out-migration from rural areas.

B. A population census conducted in 1952 showed that more Americans lived in rural areas than in urban ones.

C. Economists have found that throughout the twentieth century, the size of the labour force in America has always been largest in rural areas.

D. The estimation of per capita income in America in the mid-twentieth century primarily required data from rural areas.

41. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

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Which one of the following sets of words/phrases best encapsulates the issues discussed in the passage?

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| A. Chicago School; Native-born Whites; European immigrants; Poverty | B. Durkheim; Marx; Toennies; Shaw |
| C. Chicago School; Social organisation; Migration; Crime | D. Rapid population growth; Heavy industry; Segregation; Crime |

42. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each

question.

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A fundamental conclusion by the author is that:

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| A. the best circumstances for crime to flourish are when there are severe racial disparities. | B. to prevent crime, it is important to maintain social order through maintaining social segregation. |
| C. rapid population growth and demographic diversity give rise to social disorganisation that can feed the growth of crime. | D. according to European sociologists, crime in America is mainly in Chicago. |

43. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each

question.

Interpretations of the Indian past . . . were inevitably influenced by colonial concerns and interests, and also by prevalent European ideas about history, civilization and the Orient. Orientalist scholars studied the languages and the texts with selected Indian scholars, but made little attempt to understand the world-view of those who were teaching them. The readings therefore are something of a disjuncture from the traditional ways of looking at the Indian past. . . .

Orientalism [which we can understand broadly as Western perceptions of the Orient] fuelled the fantasy and the freedom sought by European Romanticism, particularly in its opposition to the more disciplined Neo-Classicism. The cultures of Asia were seen as bringing a new Romantic paradigm. Another Renaissance was anticipated through an acquaintance with the Orient, and this, it was thought, would be different from the earlier Greek Renaissance. It was believed that this Oriental Renaissance would liberate European thought and literature from the increasing focus on discipline and rationality that had followed from the earlier Enlightenment. . . . [The Romantic English poets, Wordsworth and Coleridge,] were apprehensive of the changes introduced by industrialization and turned to nature and to fantasies of the Orient.

However, this enthusiasm gradually changed, to conform with the emphasis later in the nineteenth century on the innate superiority of European civilization. Oriental civilizations were now seen as having once been great but currently in decline. The various phases of Orientalism tended to mould European understanding of the Indian past into a particular pattern. . . . There was an attempt to formulate Indian culture as uniform, such formulations being derived from texts that were given priority. The so-called 'discovery' of India was largely through selected literature in Sanskrit. This interpretation tended to emphasize non-historical aspects of Indian culture, for example the idea of an unchanging continuity of society and religion over 3,000 years; and it was believed that the Indian pattern of life was so concerned with metaphysics and the subtleties of religious belief that little attention was given to the more tangible aspects.

German Romanticism endorsed this image of India, and it became the mystic land for many Europeans, where even the most ordinary actions were imbued with a complex symbolism. This was the genesis of the idea of the spiritual east, and also, incidentally, the refuge of European intellectuals seeking to distance themselves from the changing patterns of their own societies. A dichotomy in values was maintained, Indian values being described as 'spiritual' and European values as 'materialistic', with little attempt to juxtapose these values with the reality of Indian society. This theme has been even more firmly endorsed by a section of Indian opinion during the last hundred years.

It was a consolation to the Indian intelligentsia for its perceived inability to counter the technical superiority of the west, a superiority viewed as having enabled Europe to colonize Asia and other parts of the world. At the height of anti-colonial nationalism it acted as a salve for having been made a colony of Britain.

It can be inferred from the passage that to gain a more accurate view of a nation's history and culture, scholars should do all of the following EXCEPT:

A. examine their own beliefs and biases.

B. develop an oppositional framework to grasp cultural differences.

C. examine the complex reality of that nation's society.

D. read widely in the country's literature.

44. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

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In the context of the passage, all of the following statements are true EXCEPT:

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| A. Indian texts influenced Orientalist scholars. | B. India's spiritualism served as a salve for European colonisers. |
| C. Orientalist scholarship influenced Indians. | D. Orientalists' understanding of Indian history was |

linked to colonial concerns.

45. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

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Which one of the following styles of research is most similar to the Orientalist scholars' method of understanding Indian history and culture?

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| A. Analysing Hollywood action movies that depict violence and sex to understand contemporary | B. Studying artefacts excavated at a palace to understand the lifestyle of those who lived there. |
|--|---|

America.

- C. Reading 18th century accounts by travellers to India to see how they viewed Indian life and culture of the time.
- D. Reading about the life of early American settlers and later waves of migration to understand the evolution of American culture.

46. Direction: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Interpretations of the Indian past . . . were inevitably influenced by colonial concerns and interests, and also by prevalent European ideas about history, civilization and the Orient. Orientalist scholars studied the languages and the texts with selected Indian scholars, but made little attempt to understand the world-view of those who were teaching them. The readings therefore are something of a disjuncture from the traditional ways of looking at the Indian past. . . .

Orientalism [which we can understand broadly as Western perceptions of the Orient] fuelled the fantasy and the freedom sought by European Romanticism, particularly in its opposition to the more disciplined Neo-Classicism. The cultures of Asia were seen as bringing a new Romantic paradigm. Another Renaissance was anticipated through an acquaintance with the Orient, and this, it was thought, would be different from the earlier Greek Renaissance. It was believed that this Oriental Renaissance would liberate European thought and literature from the increasing focus on discipline and rationality that had followed from the earlier Enlightenment. . . . [The Romantic English poets, Wordsworth and Coleridge,] were apprehensive of the changes introduced by industrialization and turned to nature and to fantasies of the Orient.

However, this enthusiasm gradually changed, to conform with the emphasis later in the nineteenth century on the innate superiority of European civilization. Oriental civilizations were now seen as having once been great but currently in decline. The various phases of Orientalism tended to mould European understanding of the Indian past into a particular pattern. . . . There was an attempt to formulate Indian culture as uniform, such formulations being derived from texts that were given priority. The so-called 'discovery' of India was largely through selected literature in Sanskrit. This interpretation tended to emphasize non-historical aspects of Indian culture, for example the idea of an unchanging continuity of society and religion over 3,000 years; and it was believed that the Indian pattern of life was so concerned with metaphysics and the subtleties of religious belief that little attention was given to the more tangible aspects.

German Romanticism endorsed this image of India, and it became the mystic land for many Europeans, where even the most ordinary actions were imbued with a complex symbolism. This was the genesis of the idea of the spiritual east, and also, incidentally, the refuge of European intellectuals seeking to distance themselves from the changing patterns of their own societies. A dichotomy in values was maintained, Indian values being described as 'spiritual' and European values as 'materialistic', with little attempt to juxtapose these values with the reality of Indian society. This theme has been even more firmly endorsed by a section of Indian opinion during the last hundred years.

It was a consolation to the Indian intelligentsia for its perceived inability to counter the technical superiority of the west, a superiority viewed as having enabled Europe to colonize Asia and other parts of the world. At the height of anti-colonial nationalism it acted as a salve for having been made a colony of Britain.

It can be inferred from the passage that the author is not likely to support the view that:

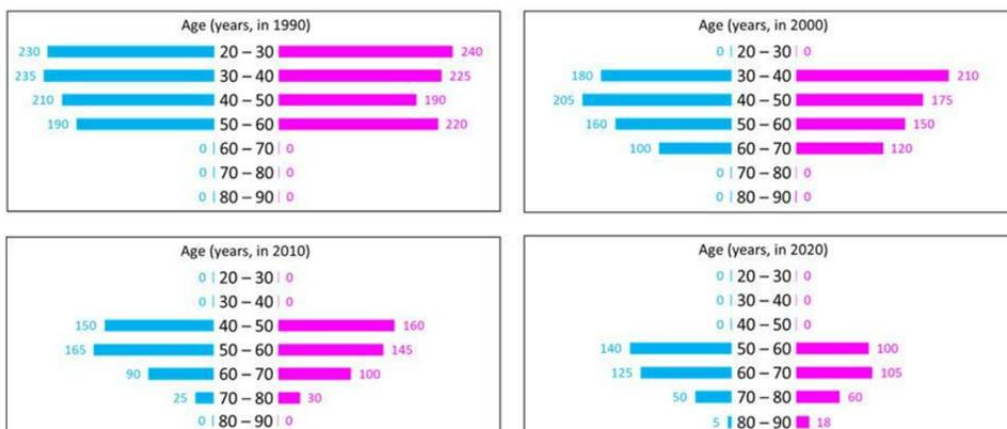
- A. the Orientalist view of Asia fired the imagination of some Western poets.
- B. Indian culture acknowledges the material aspects of life.
- C. India's culture has evolved over the centuries.
- D. India became a colony although it matched the technical knowledge of the West.

47. **Direction:** Read the information given and answer the following questions.

In the following, a year corresponds to 1st of January of that year.

A study to determine the mortality rate for a disease began in 1980. The study chose 1000 males and 1000 females and followed them for forty years or until they died, whichever came first. The 1000 males chosen in 1980 consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50. The 1000 females chosen in 1980 also consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50.

The four figures below depict the age profile of those among the 2000 individuals who were still alive in 1990, 2000, 2010, and 2020. The blue bars in each figure represent the number of males in each age group at that point in time, while the pink bars represent the number of females in each age group at that point in time. The numbers next to the bars give the exact numbers being represented by the bars. For example, we know that 230 males among those tracked and who were alive in 1990 were aged between 20 and 30.



How many of the females who were being tracked and who were between 20 and 30 years of age in 1980 died between the ages of 50 and 60?

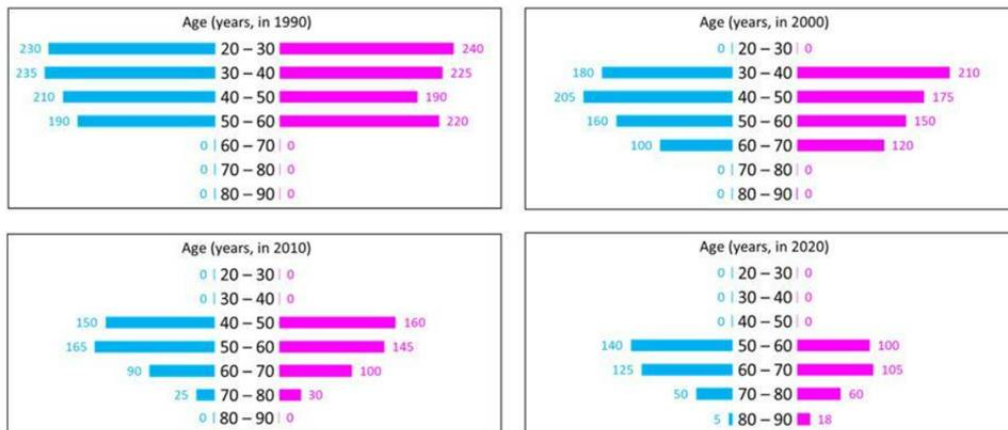
48. **Direction:** Read the information given and answer the following questions.

In the following, a year corresponds to 1st of January of that year.

A study to determine the mortality rate for a disease began in 1980. The study chose 1000 males and 1000 females and followed them for forty years or until they died, whichever came first. The 1000 males chosen in 1980 consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50. The 1000 females chosen in 1980 also consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50.

The four figures below depict the age profile of those among the 2000 individuals who were still alive in 1990, 2000, 2010, and 2020. The blue bars in each figure represent the number of males in each age group

at that point in time, while the pink bars represent the number of females in each age group at that point in time. The numbers next to the bars give the exact numbers being represented by the bars. For example, we know that 230 males among those tracked and who were alive in 1990 were aged between 20 and 30.



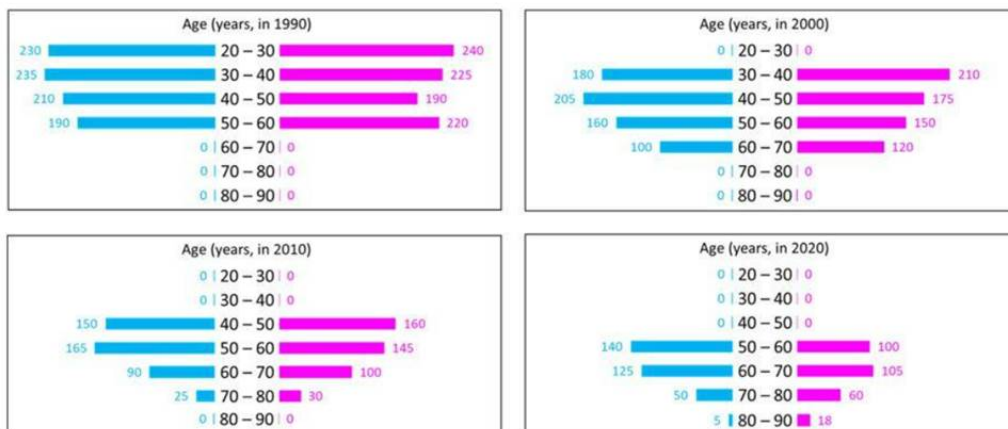
How many of the males who were being tracked and who were between 20 and 30 years of age in 1980 died in the period 2000 to 2010?

49. **Direction:** Read the information given and answer the following questions.

In the following, a year corresponds to 1st of January of that year.

A study to determine the mortality rate for a disease began in 1980. The study chose 1000 males and 1000 females and followed them for forty years or until they died, whichever came first. The 1000 males chosen in 1980 consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50. The 1000 females chosen in 1980 also consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50.

The four figures below depict the age profile of those among the 2000 individuals who were still alive in 1990, 2000, 2010, and 2020. The blue bars in each figure represent the number of males in each age group at that point in time, while the pink bars represent the number of females in each age group at that point in time. The numbers next to the bars give the exact numbers being represented by the bars. For example, we know that 230 males among those tracked and who were alive in 1990 were aged between 20 and 30.



How many individuals who were being tracked and who were less than 30 years of age in 1980 survived until 2020?

A. 470

B. 240

C. 230

D. 580

50. **Direction:** Read the information given and answer the following questions.

In the following, a year corresponds to 1st of January of that year.

A study to determine the mortality rate for a disease began in 1980. The study chose 1000 males and 1000 females and followed them for forty years or until they died, whichever came first. The 1000 males chosen in 1980 consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50. The 1000 females chosen in 1980 also consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50.

The four figures below depict the age profile of those among the 2000 individuals who were still alive in 1990, 2000, 2010, and 2020. The blue bars in each figure represent the number of males in each age group at that point in time, while the pink bars represent the number of females in each age group at that point in time. The numbers next to the bars give the exact numbers being represented by the bars. For example, we know that 230 males among those tracked and who were alive in 1990 were aged between 20 and 30.



How many people who were being tracked and who were between 30 and 40 years of age in 1980 survived until 2010?

A. 310

B. 110

C. 190

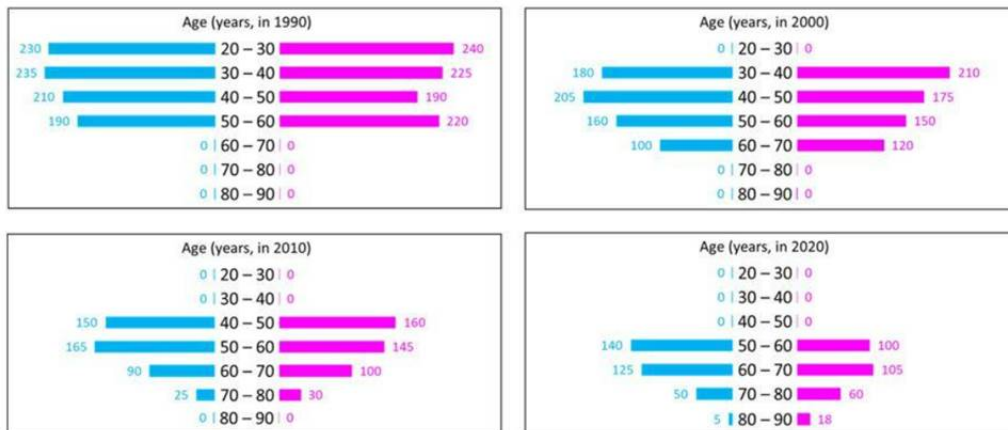
D. 90

51. **Direction:** Read the information given and answer the following questions.

In the following, a year corresponds to 1st of January of that year.

A study to determine the mortality rate for a disease began in 1980. The study chose 1000 males and 1000 females and followed them for forty years or until they died, whichever came first. The 1000 males chosen in 1980 consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50. The 1000 females chosen in 1980 also consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50.

The four figures below depict the age profile of those among the 2000 individuals who were still alive in 1990, 2000, 2010, and 2020. The blue bars represent the number of males in each age group at that point in time, while the pink bars represent the number of females in each age group at that point in time. The numbers next to the bars give the exact numbers being represented by the bars. For example, we know that 230 males among those tracked and who were alive in 1990 were aged between 20 and 30.



In 2000, what was the ratio of the number of dead males to dead females among those being tracked?

- A. 41:43
B. 71:69
C. 109:107
D. 129:131

52. **Direction:** Read the information given and answer the following questions.

There are only four neighbourhoods in a city - Levmosto, Tyhrmosto, Pesmosto and Kitmosto. During the onset of a pandemic, the number of new cases of a disease in each of these neighbourhoods was recorded over a period of five days. On each day, the number of new cases recorded in any of the neighbourhoods was either 0, 1, 2 or 3.

The following facts are also known:

1. There was at least one new case in every neighbourhood on Day 1.
2. On each of the five days, there were more new cases in Kitmosto than in Pesmosto.
3. The number of new cases in the city in a day kept increasing during the five-day period. The number of new cases on Day 3 was exactly one more than that on Day 2.
4. The maximum number of new cases in a day in Pesmosto was 2, and this happened only once during the five-day period.
5. Kitmosto is the only place to have 3 new cases on Day 2.
6. The total numbers of new cases in Levmosto, Tyhrmosto, Pesmosto and Kitmosto over the five-day period were 12, 12, 5 and 14 respectively.

On how many days did Levmosto and Tyhrmosto have the same number of new cases?

- A. 4
B. 5

C. 2

D. 3

53. **Direction:** Read the information given and answer the following questions.

There are only four neighbourhoods in a city - Levmosto, Tyhrmosto, Pesmosto and Kitmosto. During the onset of a pandemic, the number of new cases of a disease in each of these neighbourhoods was recorded over a period of five days. On each day, the number of new cases recorded in any of the neighbourhoods was either 0, 1, 2 or 3.

The following facts are also known:

1. There was at least one new case in every neighbourhood on Day 1.
2. On each of the five days, there were more new cases in Kitmosto than in Pesmosto.
3. The number of new cases in the city in a day kept increasing during the five-day period. The number of new cases on Day 3 was exactly one more than that on Day 2.
4. The maximum number of new cases in a day in Pesmosto was 2, and this happened only once during the five-day period.
5. Kitmosto is the only place to have 3 new cases on Day 2.
6. The total numbers of new cases in Levmosto, Tyhrmosto, Pesmosto and Kitmosto over the five-day period were 12, 12, 5 and 14 respectively.

Which of the two statements below is/are necessarily false?

Statement A: There were 2 new cases in Tyhrmosto on Day 3

Statement B: There were no new cases in Pesmosto on Day 2

- | | |
|--|---------------------|
| A. Neither Statement A nor Statement B | B. Statement B only |
| C. Both Statement A and Statement B | D. Statement A only |

54. **Direction:** Read the information given and answer the following questions.

There are only four neighbourhoods in a city - Levmosto, Tyhrmosto, Pesmosto and Kitmosto. During the onset of a pandemic, the number of new cases of a disease in each of these neighbourhoods was recorded over a period of five days. On each day, the number of new cases recorded in any of the neighbourhoods was either 0, 1, 2 or 3.

The following facts are also known:

1. There was at least one new case in every neighbourhood on Day 1.
2. On each of the five days, there were more new cases in Kitmosto than in Pesmosto.
3. The number of new cases in the city in a day kept increasing during the five-day period. The number of new cases on Day 3 was exactly one more than that on Day 2.

The following facts are also known:

1. There was at least one new case in every neighbourhood on Day 1.
2. On each of the five days, there were more new cases in Kitmisto than in Pesmisto.
3. The number of new cases in the city in a day kept increasing during the five-day period. The number of new cases on Day 3 was exactly one more than that on Day 2.
4. The maximum number of new cases in a day in Pesmisto was 2, and this happened only once during the five-day period.
5. Kitmisto is the only place to have 3 new cases on Day 2.
6. The total numbers of new cases in Levmosto, Tyhmosto, Pesmisto and Kitmisto over the five-day period were 12, 12, 5 and 14 respectively.

What BEST can be concluded about the total number of new cases in the city on Day 2?

- | | |
|------------------|------------------|
| A. Either 7 or 8 | B. Either 6 or 7 |
| C. Exactly 7 | D. Exactly 8 |

57. **Direction:** Read the information given and answer the following questions.

Pulak, Qasim, Ritesh, and Suresh participated in a tournament comprising of eight rounds. In each round, they formed two pairs, with each of them being in exactly one pair. The only restriction in the pairing was that the pairs would change in successive rounds. For example, if Pulak formed a pair with Qasim in the first round, then he would have to form a pair with Ritesh or Suresh in the second round. He would be free to pair with Qasim again in the third round. In each round, each pair decided whether to play the game in that round or not. If they decided not to play, then no money was exchanged between them. If they decided to play, they had to bet either ₹1 or ₹2 in that round. For example, if they chose to bet ₹2, then the player winning the game got ₹2 from the one losing the game.

At the beginning of the tournament, the players had ₹10 each. The following table shows partial information about the amounts that the players had at the end of each of the eight rounds. It shows every time a player had ₹10 at the end of a round, as well as every time, at the end of a round, a player had either the minimum or the maximum amount that he would have had across the eight rounds. For example, Suresh had ₹10 at the end of Rounds 1, 3, and 8 and not after any of the other rounds. The maximum amount that he had at the end of any round was ₹13 (at the end of Round 5), and the minimum amount he had at the end of any round was ₹8 (at the end of Round 2). At the end of all other rounds, he must have had either ₹9, ₹11, or ₹12.

It was also known that Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

Which of the following pairings was made in Round 5?

A. Pulak and Ritesh

B. Pulak and Qasim

C. Pulak and Suresh

D. Qasim and Suresh

58. **Direction:** Read the information given and answer the following questions.

Pulak, Qasim, Ritesh, and Suresh participated in a tournament comprising of eight rounds. In each round, they formed two pairs, with each of them being in exactly one pair. The only restriction in the pairing was that the pairs would change in successive rounds. For example, if Pulak formed a pair with Qasim in the first round, then he would have to form a pair with Ritesh or Suresh in the second round. He would be free to pair with Qasim again in the third round. In each round, each pair decided whether to play the game in that round or not. If they decided not to play, then no money was exchanged between them. If they decided to play, they had to bet either ₹1 or ₹2 in that round. For example, if they chose to bet ₹2, then the player winning the game got ₹2 from the one losing the game.

At the beginning of the tournament, the players had ₹10 each. The following table shows partial information about the amounts that the players had at the end of each of the eight rounds. It shows every time a player had ₹10 at the end of a round, as well as every time, at the end of a round, a player had either the minimum or the maximum amount that he would have had across the eight rounds. For example, Suresh had ₹10 at the end of Rounds 1, 3, and 8 and not after any of the other rounds. The maximum amount that he had at the end of any round was ₹13 (at the end of Round 5), and the minimum amount he had at the end of any round was ₹8 (at the end of Round 2). At the end of all other rounds, he must have had either ₹9, ₹11, or ₹12.

It was also known that Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

How many games were played with a bet of ₹2?

59. **Direction:** Read the information given and answer the following questions.

Pulak, Qasim, Ritesh, and Suresh participated in a tournament comprising of eight rounds. In each round, they formed two pairs, with each of them being in exactly one pair. The only restriction in the pairing was that the pairs would change in successive rounds. For example, if Pulak formed a pair with Qasim in the first round, then he would have to form a pair with Ritesh or Suresh in the second round. He would be free to pair with Qasim again in the third round. In each round, each pair decided whether to play the game in that round or not. If they decided not to play, then no money was exchanged between them. If they decided to play, they had to bet either ₹1 or ₹2 in that round. For example, if they chose to bet ₹2, then the player winning the game got ₹2 from the one losing the game.

At the beginning of the tournament, the players had ₹10 each. The following table shows partial information about the amounts that the players had at the end of each of the eight rounds. It shows every time a player had ₹10 at the end of a round, as well as every time, at the end of a round, a player had either the minimum or the maximum amount that he would have had across the eight rounds. For example, Suresh had ₹10 at the end of Rounds 1, 3, and 8 and not after any of the other rounds. The maximum amount that he had at the end of any round was ₹13 (at the end of Round 5), and the minimum amount he had at the end of any round was ₹8 (at the end of Round 2). At the end of all other rounds, he must have had either ₹9, ₹11, or ₹12.

It was also known that Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

How much money (in ₹) did Ritesh have at the end of Round 4?

60. **Direction:** Read the information given and answer the following questions.

Pulak, Qasim, Ritesh, and Suresh participated in a tournament comprising of eight rounds. In each round, they formed two pairs, with each of them being in exactly one pair. The only restriction in the pairing was that the pairs would change in successive rounds. For example, if Pulak formed a pair with Qasim in the first round, then he would have to form a pair with Ritesh or Suresh in the second round. He would be free to pair with Qasim again in the third round. In each round, each pair decided whether to play the game in that round or not. If they decided not to play, then no money was exchanged between them. If they decided to play, they had to bet either ₹1 or ₹2 in that round. For example, if they chose to bet ₹2, then the player winning the game got ₹2 from the one losing the game.

At the beginning of the tournament, the players had ₹10 each. The following table shows partial information about the amounts that the players had at the end of each of the eight rounds. It shows every time a player had ₹10 at the end of a round, as well as every time, at the end of a round, a player had either

the minimum or the maximum amount that he would have had across the eight rounds. For example, Suresh had ₹10 at the end of Rounds 1, 3, and 8 and not after any of the other rounds. The maximum amount that he had at the end of any round was ₹13 (at the end of Round 5), and the minimum amount he had at the end of any round was ₹8 (at the end of Round 2). At the end of all other rounds, he must have had either ₹9, ₹11, or ₹12.

It was also known that Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

What BEST can be said about the amount of money that Pulak had with him at the end of Round 6?

- A. Exactly ₹12
 B. ₹11 or ₹12
 C. ₹12 or ₹13
 D. Exactly ₹11

61. **Direction:** Read the information given and answer the following questions.

Pulak, Qasim, Ritesh, and Suresh participated in a tournament comprising of eight rounds. In each round, they formed two pairs, with each of them being in exactly one pair. The only restriction in the pairing was that the pairs would change in successive rounds. For example, if Pulak formed a pair with Qasim in the first round, then he would have to form a pair with Ritesh or Suresh in the second round. He would be free to pair with Qasim again in the third round. In each round, each pair decided whether to play the game in that round or not. If they decided not to play, then no money was exchanged between them. If they decided to play, they had to bet either ₹1 or ₹2 in that round. For example, if they chose to bet ₹2, then the player winning the game got ₹2 from the one losing the game.

At the beginning of the tournament, the players had ₹10 each. The following table shows partial information about the amounts that the players had at the end of each of the eight rounds. It shows every time a player had ₹10 at the end of a round, as well as every time, at the end of a round, a player had either the minimum or the maximum amount that he would have had across the eight rounds. For example, Suresh had ₹10 at the end of Rounds 1, 3, and 8 and not after any of the other rounds. The maximum amount that he had at the end of any round was ₹13 (at the end of Round 5), and the minimum amount he had at the end of any round was ₹8 (at the end of Round 2). At the end of all other rounds, he must have had either ₹9, ₹11, or ₹12.

It was also known that Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

What BEST can be said about the amount of money that Ritesh had with him at the end of Round 8?

- A. Exactly ₹6
 B. ₹4 or ₹5
 C. Exactly ₹5
 D. ₹5 or ₹6

62. **Direction:** Read the information given and answer the following questions.

All the first-year students in the computer science (CS) department in a university take both the courses (i) AI and (ii) ML. Students from other departments (non-CS students) can also take one of these two courses, but not both. Students who fail in a course get an F grade; others pass and are awarded A or B or C grades depending on their performance. The following are some additional facts about the number of students who took these two courses this year and the grades they obtained.

1. The numbers of non-CS students who took AI and ML were in the ratio 2:5.
2. The number of non-CS students who took either AI or ML was equal to the number of CS students.
3. The numbers of non-CS students who failed in the two courses were the same and their total is equal to the number of CS students who got a C grade in ML.
4. In both the courses, 50% of the students who passed got a B grade. But, while the numbers of students who got A and C grades were the same for AI, they were in the ratio 3:2 for ML.
5. No CS student failed in AI, while no non-CS student got an A grade in AI.
6. The numbers of CS students who got A, B and C grades respectively in AI were in the ratio 3:5:2, while in ML the ratio was 4:5:2.
7. The ratio of the total number of non-CS students failing in one of the two courses to the number of CS students failing in one of the two courses was 3:1.
8. 30 students failed in ML.

How many non-CS students got B grade in ML?

- A. 165
 B. 75
 C. 25
 D. 90

63. **Direction:** Read the information given and answer the following questions.

All the first-year students in the computer science (CS) department in a university take both the courses (i) AI and (ii) ML. Students from other departments (non-CS students) can also take one of these two courses, but not both. Students who fail in a course get an F grade; others pass and are awarded A or B or C grades

depending on their performance. The following are some additional facts about the number of students who took these two courses this year and the grades they obtained.

1. The numbers of non-CS students who took AI and ML were in the ratio 2:5.
2. The number of non-CS students who took either AI or ML was equal to the number of CS students.
3. The numbers of non-CS students who failed in the two courses were the same and their total is equal to the number of CS students who got a C grade in ML.
4. In both the courses, 50% of the students who passed got a B grade. But, while the numbers of students who got A and C grades were the same for AI, they were in the ratio 3:2 for ML.
5. No CS student failed in AI, while no non-CS student got an A grade in AI.
6. The numbers of CS students who got A, B and C grades respectively in AI were in the ratio 3:5:2, while in ML the ratio was 4:5:2.
7. The ratio of the total number of non-CS students failing in one of the two courses to the number of CS students failing in one of the two courses was 3:1.
8. 30 students failed in ML.

How many students got A grade in AI?

- A. 63
B. 99
C. 84
D. 42

64. **Direction:** Read the information given and answer the following questions.

All the first-year students in the computer science (CS) department in a university take both the courses (i) AI and (ii) ML. Students from other departments (non-CS students) can also take one of these two courses, but not both. Students who fail in a course get an F grade; others pass and are awarded A or B or C grades depending on their performance. The following are some additional facts about the number of students who took these two courses this year and the grades they obtained.

1. The numbers of non-CS students who took AI and ML were in the ratio 2:5.
2. The number of non-CS students who took either AI or ML was equal to the number of CS students.
3. The numbers of non-CS students who failed in the two courses were the same and their total is equal to the number of CS students who got a C grade in ML.
4. In both the courses, 50% of the students who passed got a B grade. But, while the numbers of students who got A and C grades were the same for AI, they were in the ratio 3:2 for ML.
5. No CS student failed in AI, while no non-CS student got an A grade in AI.
6. The numbers of CS students who got A, B and C grades respectively in AI were in the ratio 3:5:2, while in ML the ratio was 4:5:2.
7. The ratio of the total number of non-CS students failing in one of the two courses to the number of CS students failing in one of the two courses was 3:1.
8. 30 students failed in ML.

How many non-CS students got A grade in ML?

65. **Direction:** Read the information given and answer the following questions.

All the first-year students in the computer science (CS) department in a university take both the courses (i) AI and (ii) ML. Students from other departments (non-CS students) can also take one of these two courses, but not both. Students who fail in a course get an F grade; others pass and are awarded A or B or C grades

depending on their performance. The following are some additional facts about the number of students who took these two courses this year and the grades they obtained.

1. The numbers of non-CS students who took AI and ML were in the ratio 2:5.
2. The number of non-CS students who took either AI or ML was equal to the number of CS students.
3. The numbers of non-CS students who failed in the two courses were the same and their total is equal to the number of CS students who got a C grade in ML.
4. In both the courses, 50% of the students who passed got a B grade. But, while the numbers of students who got A and C grades were the same for AI, they were in the ratio 3:2 for ML.
5. No CS student failed in AI, while no non-CS student got an A grade in AI.
6. The numbers of CS students who got A, B and C grades respectively in AI were in the ratio 3:5:2, while in ML the ratio was 4:5:2.
7. The ratio of the total number of non-CS students failing in one of the two courses to the number of CS students failing in one of the two courses was 3:1.
8. 30 students failed in ML.

How many CS students failed in ML?

66. **Direction:** Read the information given and answer the following questions.

All the first-year students in the computer science (CS) department in a university take both the courses (i) AI and (ii) ML. Students from other departments (non-CS students) can also take one of these two courses, but not both. Students who fail in a course get an F grade; others pass and are awarded A or B or C grades depending on their performance. The following are some additional facts about the number of students who took these two courses this year and the grades they obtained.

1. The numbers of non-CS students who took AI and ML were in the ratio 2:5.
2. The number of non-CS students who took either AI or ML was equal to the number of CS students.
3. The numbers of non-CS students who failed in the two courses were the same and their total is equal to the number of CS students who got a C grade in ML.
4. In both the courses, 50% of the students who passed got a B grade. But, while the numbers of students who got A and C grades were the same for AI, they were in the ratio 3:2 for ML.
5. No CS student failed in AI, while no non-CS student got an A grade in AI.
6. The numbers of CS students who got A, B and C grades respectively in AI were in the ratio 3:5:2, while in ML the ratio was 4:5:2.
7. The ratio of the total number of non-CS students failing in one of the two courses to the number of CS students failing in one of the two courses was 3:1.
8. 30 students failed in ML.

How many students took AI?

- | | |
|--------|--------|
| A. 90 | B. 60 |
| C. 270 | D. 210 |

Solutions

1. Correct Answer : C

Sol 1. Initially: a glass of 500 cc milk and a cup of 500 cc water

Step 1: 150 cc of milk is transferred to the cup from the glass

After step 1: Glass - 350 cc of milk, Cup - 150 cc of milk, and 500 cc of water

Step 2: 150 cc of this mixture is transferred from the cup to the glass

After step 2:

Glass - 350 cc milk + 150 cc mixture of milk and water in the ratio 3 : 10

Cup - 500 cc mixture of milk and water in the ratio 3 : 10

$$\text{Water in glass : Milk in cup} = \frac{10}{13} \times 150 : \frac{3}{13} \times 500 = 1 : 1$$

2. Correct Answer : D

Sol 2. Observe that $f(r) = 2r - r = r$.

Therefore, $f(f(r)) = f(r) = r$.

For any $x < r$,

$$f(x) = r$$

$$f(f(x)) = f(f(r)) = r$$

For any $x > r$,

(Let's assume that $x = kr$, where k is some number greater than 1.)

$$f(x) = f(kr) = 2kr - r = (2k - 1)r$$

Since k is greater than 1, $(2k - 1)$ is greater than k .

This means that every time we put an input that is greater than r , the output is greater than the input.

So, for any $x > r$,

$$f(f(x)) \neq f(f(r))$$

Therefore, for $f(f(x)) = f(x)$ to be satisfied, the necessary condition is $x \leq r$.

3. Correct Answer : D

Sol 3. We know that the sum of the first pair of numbers is $14 \times 2 = 28$

Sum of the last pair of numbers is $28 \times 2 = 56$

To maximise the average of all the 6 numbers, we must try to maximise the two numbers in between. This is possible when the last pair of numbers is 27 and 29.

The maximum average case is:

a, b, 25, 26, 27, 29

where $a + b = 28$

The average of these 6 numbers is 22.5.

4. Correct Answer : A

Sol 4.
$$\frac{x^2 - 6x + 10}{3 - x} = \frac{x^2 - 6x + 9 + 1}{3 - x}$$

$$= \frac{x^2 - 6x + 9}{3 - x} + \frac{1}{3 - x}$$

$$= \frac{(x - 3)^2}{3 - x} + \frac{1}{3 - x}$$

$$\text{As } (x - 3)^2 = (3 - x)^2$$

$$= \frac{(3 - x)^2}{3 - x} + \frac{1}{3 - x} = 3 - x + \frac{1}{3 - x}$$

Since $x < 3$, $3 - x$ is positive

Let $k = 3 - x$

Since k is positive, the minimum value of $k + \frac{1}{k} = 2$.

5. Correct Answer : 548

Sol 5. The common difference of the AP, 38, 55, 72, ... is 17.

The smallest 3-digit number in the AP is 106 and the largest 3-digit number in it is 990.

We need to find the value of,

$$106 + 123 + \dots + 973 + 990$$

$$= 106 + (106 + 17) + (106 + 2 \cdot 17) + \dots + (106 + 52 \cdot 17)$$

$$= 53(106) + 17(1 + 2 + 3 + \dots + 52)$$

$$= 53(106) + 17 \times \frac{52 \times 53}{2}$$

So, average of these 53 numbers = $\frac{Sum}{53} = 106 + \frac{17 \times 52}{2} = 106 + 17 \times 26 = 548$

6. Correct Answer : A

Sol 6. $c = \frac{16x}{y} + \frac{49y}{x}$

Let $k = \frac{x}{y}$

Since x and y are real, k is also real.

$$c = 16k + \frac{49}{k}$$

$$16k^2 - ck + 49 = 0$$

We know that k is real, for k to be real, it has to be rational first.

$$\Rightarrow c^2 > 4 \times 16 \times 49$$

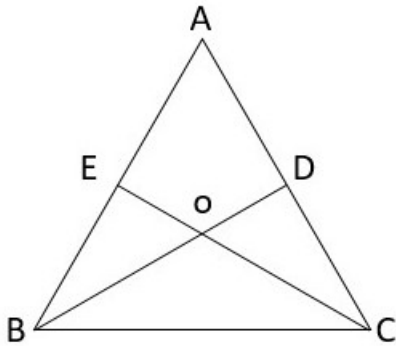
$$\Rightarrow c^2 > 56^2$$

$$\Rightarrow |c| > 56$$

So, c can't take the value -50.

7. Correct Answer : 9

Sol 7.



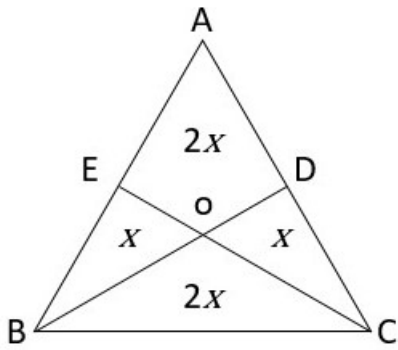
O is the centroid of triangle ABC, which means:

$$BO : OD = 2 : 1$$

$$CO : OE = 2 : 1$$

$$Ar(BOC) : Ar(ODC) = 2 : 1$$

$$Ar(COB) : Ar(OEB) = 2 : 1$$



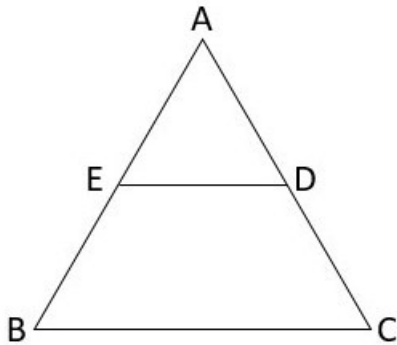
Since BD is the median, $\text{Ar}(BDA) = \text{Ar}(BDC)$

This means $\text{Ar}(AEOD) = 2x$

$$2x + x + x + 2x = 108$$

$$6x = 108$$

$$\text{Ar}(AEOD) = 2x = 36$$



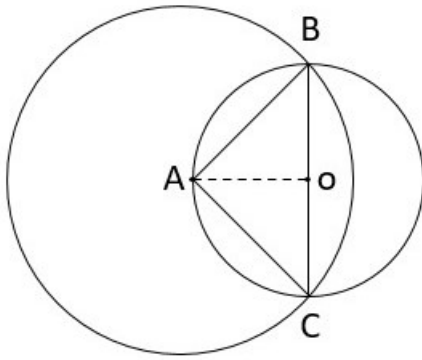
Since ED is the line joining the midpoints of AB and AC, $\text{Ar}(AED) = \frac{1}{4} \text{Ar}(ABC)$

$$\text{Ar}(AED) = \frac{1}{4} \text{Ar}(108) = 27$$

$$\text{Ar}(EOD) = \text{Ar}(AEOD) - \text{Ar}(AED) = 36 - 27 = 9 \text{ sq cm}$$

8. Correct Answer : D

Sol 8.



$$AB = AC = 8\text{cm}$$

Since BC is the diameter, angle A has to be right-angled and angle B = angle C = 45 degrees.

Therefore, the radius of the circle centred at O is $4\sqrt{2}$ cm.

The radius of the circle centred at A is 8 cm.

The common area between them = (half of the smaller circle) + (and the minor segment created by the chord BC in the bigger circle)

$$= \frac{1}{2}\pi(4\sqrt{2})^2 + \text{area (sector } AOB) - \text{area(triangle } AOB)$$

$$= 16\pi + \frac{1}{4}\pi(8)^2 - \frac{1}{2} \times 8 \times 8$$

$$= 16\pi + 16\pi - 32 = 32\pi - 32 = 32(\pi - 1)$$

9. Correct Answer : 150

Sol 9. Let the number of students in the school be N.

$$N < 5000$$

N leaves a remainder of 4 when divided by 9, 10, 12, or 25.

Since 4 is less than 9, 10, 12, and 25,

N leaves a remainder of 4 when divided by LCM(9, 10, 12, 25).

N leaves a remainder of 4 when divided by 900.

$$N = 900(x) + 4$$

Since $N < 5000$

x can range from 0 to 5.

But $900(x) + 4$ is a multiple of 11 only when $x = 2$.

$$N = 900(2) + 4 = 1804$$

When we divide these 1804 students into groups of 12, we get 150 groups.

$$\text{Because } 1804 = 12(150) + 4$$

10. Correct Answer : C

Sol 10. The number of 4-digit numbers using 1, 1, 2, and 4 is $\frac{4!}{2!} = 12$

The number of 1s, 2s, and 4s in the units digit will be in the ratio 2 : 1 : 1, i.e., 6 1s, 3 2s, and 3 4s.

$$\text{Sum} = 6(1) + 3(2) + 3(4) = 24$$

It will be the same in tens digit, hundreds digit, and thousands digit as well.

$$\text{Therefore, sum} = 24 + 24(10) + 24(100) + 24(1000) = 24(1111)$$

$$\text{So, the arithmetic mean} = \frac{24(1111)}{12} = 2222$$

11. Correct Answer : D

Sol 11. Both the cars take 1.5 h to meet when they travel towards each other.

It is given that the speed of a slower car is 60 km/h.

$$\text{Therefore, distance covered by the slower car before the two cars meet} = 60 \times 1.5 = 90 \text{ km}$$

12. Correct Answer : 11

Sol 12. Let the efficiency of Bob be 3 units/day. So, Alex's efficiency will be 6 units/day, and Cole's will be 2 units/day.

Since Bob can finish the job in 40 days, the total work will be $40 \times 3 = 120$ units. Since Alex and Bob work on the first day, the total work done = $3 + 6 = 9$ units. Similarly, for days 2 and 3, it will be 5 and 8 units, respectively.

$$\text{Thus, in the first 3 days, the total work done} = 9 + 5 + 8 = 22 \text{ units.}$$

$$\text{The work done in the first 15 days} = 22 \times 5 = 110 \text{ units.}$$

Thus, the work will be finished on the 17th day (since $9 + 5 = 14$ units are greater than the remaining work).

Since Alex works on two days of every 3 days, he will work for 10 days out of the first 15 days.

Then, he will also work on the 16th day.

$$\text{The total number of days} = 11$$

13. Correct Answer : 60

Sol 13. Let the speed of Moody be 'x' steps/s and that of the escalator be 'y' steps/s

In 30 seconds, Moody will finish riding the escalator when going in the same direction.

Thus, total steps = $30(x + y)$

If Moody's speed becomes twice, the time becomes 20 seconds.

Thus, total steps = $20(2x + y)$

Or $30x + 30y = 40x + 20y \Rightarrow x = y$

So, total steps = $60y$

Time taken by only the escalator = $60y/y = 60$ s.

14. Correct Answer : D

Sol 14. N people finish 35% of the project by working 7 hours a day for 10 days.

N people finish 35% of the project by working 70 hours.

N people finish 5% of the project by working 10 hours.

N people finish 65% of the project by working 130 hours.

65% of the project is done in $N \times 130$ man hours.

The remaining 65% was actually done by $(N - 10)$ people in 14 days by working 10 hours a day.

$(N - 10)$ people finish 65% of the project by working 140 hours.

65% of the project is done in $(N - 10) \times 140$ man hours.

$$N \times 130 = (N - 10) \times 140$$

$$13N = 14N - 140$$

$$N = 140$$

15. Correct Answer : 14

Sol 15.
$$\left(\sqrt{\frac{7}{5}}\right)^{3x-y} = \frac{875}{2401}$$

$$\left(\sqrt{\frac{7}{5}}\right)^{3x-y} = \left(\frac{7}{5}\right)^{\frac{3x-y}{2}} = \frac{125}{343} = \left(\frac{5}{7}\right)^3 = \left(\frac{7}{5}\right)^{-3}$$

$$\Rightarrow 3x - y = -6$$

$$\left(\frac{4a}{b}\right)^{6x-y} = \left(\frac{2a}{b}\right)^{y-6x}$$

Therefore, $y = 6x$; as the bases are different, the power should be zero for the results to be equal.

$$\text{So, } 3x - 6x = -6$$

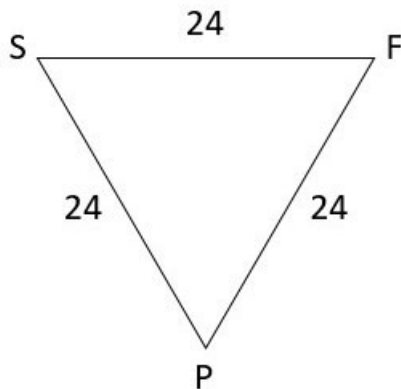
$$\Rightarrow x = 2$$

$$\Rightarrow y = 6(2) = 12$$

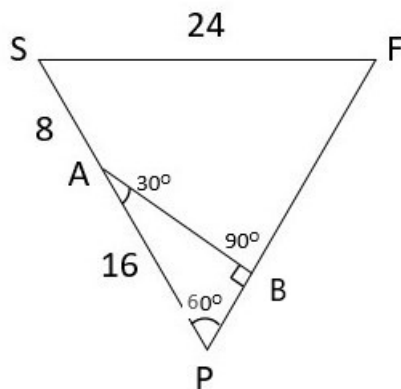
$$\text{Thus, } x + y = 2 + 12 = 14.$$

16. Correct Answer : D

Sol 16. Let us denote the port by P, the slower ship by S, the faster ship by F.



Let their new positions be A and B.



Triangle APB is right-angled. We know that angle APB is 60 degrees because triangle SFA is equilateral. The right angle must be at point B, because angle PAB is less than 60 degrees.

$$\sin 30^\circ = \frac{1}{2} = \frac{BP}{AP}$$

$$BP = 0.5(AP) = 8$$

$$BF = FP - BP = 24 - 8 = 16$$

That means the faster ship is twice as fast as the slower one.

So, when the faster ship reaches the port covering 24 km, the slower ship covers only 12 km and has remaining 12 km left to cover.

17. Correct Answer : C

Sol 17. $2x^2 + kx + 5 = 0$ has no real roots so $D < 0$.

$$k^2 - 40 < 0$$

$$(k - \sqrt{40})(k + \sqrt{40}) < 0$$

$$k \in (-\sqrt{40}, \sqrt{40})$$

$x^2 + (k - 5)x + 1 = 0$ has two distinct real roots so $D > 0$.

$$(k - 5)^2 - 4 > 0$$

$$k^2 - 10k + 21 > 0$$

$$(k - 3)(k - 7) > 0$$

$$K \in (-\infty, 3) \cup (7, \infty)$$

Therefore, the possible values of k are -6, -5, -4, -3, -2, -1, 0, 1, 2.

So, in total 9 integer values of k are possible.

18. Correct Answer : A

Sol 18. The sum of the three sides of a quadrilateral is greater than the largest fourth side.

Let the fourth side be 'd'.

Case1: d is the largest side.

$$1 + 2 + 4 > d \text{ or } d < 7$$

So, d can take the following values: 4, 5, 6

Case2: 4 is the largest side and $d < 4$.

$$1 + 2 + d > 4 \text{ or } d > 1$$

So, d can take the following values: 2, 3

Hence, the possible values of d are 2, 3, 4, 5, and 6.

Thus, d can take 5 values.

19. Correct Answer : D

Sol 19. If $(3 + 2\sqrt{2})$ is a root of the equation $ax^2 + bx + c = 0$, so is $(3 - 2\sqrt{2})$.

$$ax^2 + bx + c = (x - (3 + 2\sqrt{2}))(x - (3 - 2\sqrt{2}))$$

$$ax^2 + bx + c = x^2 - 6x + 1 \dots(1)$$

If $(4 + 2\sqrt{3})$ is a root of the equation $ay^2 + my + n = 0$, so is $(4 - 2\sqrt{3})$.

$$ay^2 + my + n = (y - (4 + 2\sqrt{3}))(y - (4 - 2\sqrt{3}))$$

$$ay^2 + my + n = y^2 - 8y + 4 \dots(2)$$

Comparing both sides in (1), we get $a = 1$, $b = -6$, and $c = 1$

Comparing both sides in (2), we get $a = 1$, $m = -8$, and $n = 4$

$$\text{So, the value of } \left(\frac{b}{m} + \frac{c-2b}{n}\right) = \left(\frac{-6}{-8} + \frac{1-2(-6)}{4}\right) = \frac{3}{4} + \frac{13}{4} = 4$$

20. Correct Answer : 12

Sol 20. Let the number of cheques of ₹100, ₹250, and ₹500 be x, y, and z, respectively.

We need to find the maximum value of z.

$$x + y + z = 100 \dots\dots (1)$$

$$100x + 250y + 500z = 15250$$

$$2x + 5y + 10z = 305 \dots\dots (2)$$

Now multiply (1) by (2),

$$2x + 2y + 2z = 200 \dots\dots(3)$$

(2) - (3), we get:

$$3y + 8z = 105$$

$$\text{At } z = 12, x = 3$$

Therefore, the maximum value z can take is 12.

21. Correct Answer : A

Sol 21. If Neetu intended to get a 5% annual interest, ideally all the banks should have maintained a 5% interest rate.

But Bank A returns 0.5% extra interest on ₹8000, which is ₹40.

But Bank B returns 0.6% extra interest on ₹5000, which is ₹30.

A and B combined are paying ₹70 more than 5%.

So Bank C should maintain such an interest rate that the interest generated on the remaining ₹7000 is 70 less than 5% interest.

Since 70 is 1% of 7000, the interest rate at Bank C should be $5\% - 1\% = 4\%$.

If the entire amount of ₹20,000 was invested in Bank C, the interest generated is 4% of 20,000 = ₹800.

22. Correct Answer : 63

Sol 22. Let the number of students in section A and B be 'a' and 'a + 10', respectively.

Now, according to the question,

$\frac{32a + 60(a + 10)}{a + a + 10}$ is an integer.

$\Rightarrow \frac{92a + 600}{2a + 10}$ or $\frac{46a + 300}{a + 5}$ is an integer.

$\Rightarrow \frac{46(a + 5) + 70}{a + 5}$ is an integer.

$\Rightarrow 46 + \frac{70}{a + 5}$ is an integer.

So, a = 2, 5, 9, 30, 65

So, the required difference = $65 - 2 = 63$

23. Correct Answer : 2314

Sol 23. We need to figure out the mandatory pairs first. 23 is a mandatory pair. 3 follows 2 as 'us' in 3 refers to 'me and my sister' in 2. 14 is a mandatory pair as 'that' in 4 refers to being made to feel guilty for not going out in 1. 23 comes before 14 because 2 introduces the mum and the kids. Hence, 2314 is the correct sequence.

24. Correct Answer : 3214

Sol 24. The first thing to do here is to fix 3 as the first sentence as it introduces meritocracy. 3 should be followed by 2 as 3 talks about 'Meritocracy as an organising principle is an inevitable function of a free society.' and 2 talks about the limits of merit. Note the use of 'but' in 2. 1 follows 2 as 2 talks about 'an opportunity to reassert the importance of luck or grace in our thinking' and 1 explains how to reassert the importance of luck or grace in our thinking. 4 comes after 1 as it carries the same idea forward. Note the use of 'And' in 4.

25. Correct Answer : 4312

Sol 25. The first sentence can be easily fixed as 4 because it introduces beacons. 4 and 3 form a mandatory pair as 4 talks about 'technology devices that can send radio frequency signals and notify nearby Bluetooth devices' and 3 talks about 'capturing the beacon signals'. 1 and 2 form a pair as 1 talks

about various industrial sectors ‘leveraging these beacons solutions to track and communicate with their customers’ and 2 talks about how these beacons are used. Hence, the correct answer is 4312.

26. Correct Answer : A

Sol 26. Let’s see the main points first:

- Alphabetical order was not an immediate consequence of the alphabet itself
- Middle ages: religious influence led to rejection of alphabetical order
- Rediscovery of the ancient Greek and Roman classics: more efficient ways of ordering, searching, and referencing texts required
- 16th and 17th centuries: quickened the advance of alphabetical order

These ideas are summarised well in option A.

Option B contradicts the paragraph. Option C is incorrect because adoption of the written alphabet was not easily accomplished. Option D is incorrect because it talks about ‘the ban on the use by scholars of any form of categorisation’ which is incorrect.

27. Correct Answer : D

Sol 27. According to the passage, anyone can now steal fashion images and ideas from social media without giving any due credit or compensation to the original communities. This is expressed correctly in option D.

According to A ‘design or pattern of textile from native communities who own them is tantamount to stealing.’ The issue is that a particular design or pattern is not owned by the native communities but techniques belong to the communities.

Option B is clearly incorrect as ‘cultural collaboration’ is not mentioned in the given paragraph.

Option C ‘media encouraging mass production’ has not been mentioned anywhere in the paragraph.

28. Correct Answer : A

Sol 28. This is an easy summary question that can be solved with the help of elimination. The main points of the paragraph are as follow:

- Job of comedy is to offend
- Every joke has a victim
- One should be allowed to make jokes about absolutely anything
- Cancel culture

A covers all the main points of the paragraph.

B talks about ‘politicians and royalty’, which are not mentioned in the given paragraph.

C is not incorrect but doesn't talk about cancel culture.

D is incorrect because it talks about 'the role and duty of comedians', which is not the theme of the given paragraph.

29. Correct Answer : B

Sol 29. The given sentence talks about the uncertainty around wide scale return to office. When we look at the sentence before options 1 and 2, it seems like the given sentence can fit any of the two options. However when we look at them closely, we see that the sentence before 1 talks about 'best laid plans have often not materialised' and the sentence before 2 talks about the flow of workers being 'more of a trickle than a steady stream'. The uncertainty mentioned in the given sentence goes well with the 'trickle' mentioned in the sentence before option 2. Hence, the right place is option 2 and the correct answer is B. Options 3 and 4 are not even close because 'this' in the given sentence implies that it refers to something in the previous sentence but there is nothing in the two sentences which the given sentence can refer to.

30. Correct Answer : B

Sol 30. The given sentence cannot come at the first place because the first sentence given in the paragraph makes a good introductory sentence. There is no direct connection between the two sentences. The sentence before the second blank talks about relying on social learning and socially acquired information. The given sentence explains the process of social learning. The sentence after the second blank carries this idea forward. Hence, option 2 is the correct place for the given sense, and the correct answer is B.

31. Correct Answer : D

Sol 31. Refer to the following lines of the passage: The people using the more advanced software, meanwhile, would often 'aimlessly click around' when confronted with a tricky problem. The supposedly helpful software actually short-circuited their thinking and learning.

The people who were using the more advanced software were expecting the software to do their work. They did not think on their own.

Hence, we can infer that they were clicking the mouse, hoping for some response from the computer.

Hence, D is the correct answer.

32. Correct Answer : B

Sol 32. The author mentions options A, C, and D.

Computers replacing human beings has not been mentioned in the passage.

Hence, B is the correct answer.

33. Correct Answer : D

Sol 33. Human-centred automation is automation, which is controlled by humans.

Option A, B, and C operate under human control.

D is automatic and not human driven.

Hence, D is the correct answer.

34. Correct Answer : A

Sol 34. 'Missing the forest for the trees' means not getting a general or proper understanding of a situation.

In the given situation, the doctors did not use their knowledge and intuition but relied on the data processed by digital templates for their diagnosis and ended up misdiagnosing.

So, the correct answer is A.

35. Correct Answer : D

Sol 35. Simplifying the given sentence and rephrasing it, we see that the sentence states that the so-called veil or boundary between organic and the manufactured has dissolved. It reveals that there is no difference between the two.

This point has been best expressed in D.

A is incorrect as it implies that the organic or natural veil has crumpled under the manufacturing veil. The option indicates that there are two veils or boundaries.

B is incorrect as it twists the words and terms used in the given sentence. It tries to differentiate between apparent and organic reality, while the given sentence mentions the 'apparent' veil between organic and manufactured reality.

C is incorrect as it uses the ambiguous term 'same being'.

Hence, D is the correct answer.

36. Correct Answer : B

Sol 36. We have to identify the option/argument that can be inferred from the passage.

Refer to the following lines - The root of bioengineering is the desire to control the organic long enough to improve it.

Also refer to the following lines- Genetic engineering is precisely what cattle breeders do when they select better strains of Holsteins, only bioengineers employ more precise and powerful control.

Thus both bio and genetic engineering are similar in trying to improve evolution

Option A is incorrect the biological realm is complex and the mechanical one is trying to emulate

Option C is extremely worded- 'pinnacle of scientific expertise' is not implied in the passage

Option D misrepresents the following lines of the passage - Although many philosophers in the past have suspected one could abstract the laws of life and apply them elsewhere"

"suspected' does not imply knowing for sure

Hence B is the correct answer

37. Correct Answer : D

Sol 37. Reading the paragraphs and identifying the keywords and phrases shows that D has the correct sequence of key words and phrases. Hence, D is the correct answer.

38. Correct Answer : C

Sol 38. The author means that 'bionic convergence' is becoming more or less a matter of semantics as the difference between what is mechanics and what is life is getting blurred.

Hence, C is the correct answer.

39. Correct Answer : D

Sol 39. We have to look for an option that cannot be inferred from the passage: Either something that is out of scope of the passage or something that contradicts the main point of the passage.

Option A can be inferred from the following lines of the passage: These migrants...were not integrated into the cities they now called home...most American cities at the end of the twentieth century were characterised by high levels of racial residential segregation . . . Failure to integrate these migrants, coupled with other forces of social disorganisation such as crowding, poverty, and illness, caused crime rates to climb in the cities...

Option B can be inferred from the opening lines of the passage: Sociologists working in the Chicago School tradition have focused on how rapid or dramatic social change causes increases in crime.

Option C can be inferred from the following lines: Failure to integrate these migrants, coupled with other forces of social disorganisation such as crowding, poverty, and illness, caused crime rates to climb in the cities, particularly in the segregated wards and neighbourhoods where the migrants were forced to live.

Option D cannot be inferred from the passage. The author does not mention being less organised as a reason for slower social integration.

Hence, D is the correct answer.

40. Correct Answer : A

Sol 40. The given statement says that at the start of the 20th century, the rural population of America was greater but by the mid 20th century, the urban dwellers were more.

The question asks us to identify the option that goes in line with the given statement.

Option A does that as it states that people started moving out of rural areas in the 20th century.

Hence, A is the correct answer.

B and C contradicts the passage by saying that more people lived in rural areas and D is irrelevant.

41. Correct Answer : C

Sol 41. Determining the issues discussed in the passage, we can see that the first paragraph is about the views of the sociologists of the Chicago School.

The second paragraph is about how social organisation in Chicago was affected by immigration.

The next paragraph mentions the 'greater migration' in America, which resulted in an increase in crime.

The author sums up the passage by mentioning how 'the combination of rapid population growth with the diversity of those moving into the cities created what the Chicago School sociologists called social disorganisation.'

These points are best expressed in the right order in option C.

Hence, C is the correct answer.

42. Correct Answer : C

Sol 42. A quick reading of the passage will help identify the main point and conclusion of the author.

The author's main point is given in the first few lines of the passage and explained in the subsequent paragraphs.

Refer to the first few lines: Sociologists working in the Chicago School tradition have focused on how rapid or dramatic social change causes increases in crime. Just as Durkheim, Marx, Toennies, and other European sociologists thought that the rapid changes produced by industrialisation and urbanisation produced crime and disorder, so did the Chicago School theorists.

In the following paragraph, it has been mentioned that rapid population growth is a disorganising influence, but growth resulting from in-migration of very different people is particularly disruptive.

In the concluding lines of the paragraph, the author mentions that the combination of rapid population growth with the diversity of those moving into the cities created what the Chicago School sociologists called social disorganisation.

Thus, we can see that the fundamental conclusion is that rapid population growth and demographic diversity give rise to social disorganisation that can feed the growth of crime.

Hence, C is the correct answer.

43. Correct Answer : B

Sol 43. The author is critical of the manner in which scholars study a nation's history and culture. The passage mentions the biases and beliefs of scholars, the disregard of the subject nation's history and literature, and the neglect of the world view of the natives.

So, the author would like the scholars to follow the steps mentioned in options A, C, and D.

B is meaningless. Building an oppositional framework to grasp cultural differences has not been mentioned and would not help given the author's views in the passage.

Hence, B is the correct answer.

44. Correct Answer : B

Sol 44. Option B has not been mentioned in the passage.

Option A has been mentioned in the following lines: Orientalist scholars studied the languages and the texts with selected Indian scholars.

Option C: Interpretations of the Indian past . . . were inevitably influenced by colonial concerns and interests, and also by prevalent European ideas about history, civilisation, and the Orient.

Option D is true. Refer to the following lines: At the height of anti-colonial nationalism, it acted as a salve for having been made a colony of Britain.

B is not true. It misrepresents the last line of the passage.

Hence, D is the correct answer.

45. Correct Answer : A

Sol 45. The author is critical of the Orientalist scholars' method of understanding Indian history and culture. According to him, 'Orientalist scholars studied the languages and the texts with selected Indian scholars, but made little attempt to understand the world-view of those who were teaching them. The readings therefore are something of a disjuncture from the traditional ways of looking at the Indian past.

So, we have to look at a method analogous to this flawed method. Option A is the most similar. It involves analysing contemporary American society by studying Hollywood action movies. There is no attempt to understand the people of the country

Hence A is the correct answer

46. Correct Answer : D

Sol 46. Refer to the lines of the concluding paragraph: It was a consolation to the Indian intelligentsia for its perceived inability to counter the technical superiority of the west, a superiority viewed as having enabled Europe to colonise Asia and other parts of the world.

In other words, the author states that India could not match the technical knowledge of the west. Hence, D is the correct answer

47. Correct Answer : 30

Sol 47.

Males				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	230	235	210	190
2000	180	205	160	100
2010	150	165	90	25
2020	140	125	50	5
Females				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	240	225	190	220
2000	210	175	150	120
2010	160	145	100	30
2020	100	105	60	18

The answer should be ‘cannot be determined’ as some extra information may be needed to find the correct answer.

48. Correct Answer : 40

Sol 48.

Males				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	230	235	210	190
2000	180	205	160	100
2010	150	165	90	25
2020	140	125	50	5
Females				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	240	225	190	220
2000	210	175	150	120
2010	160	145	100	30
2020	100	105	60	18

The required answer = $205 - 165 = 40$

49. Correct Answer : A

Sol 49.

Males				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	230	235	210	190
2000	180	205	160	100
2010	150	165	90	25
2020	140	125	50	5
Females				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	240	225	190	220
2000	210	175	150	120
2010	160	145	100	30
2020	100	105	60	18

The required answer = $140 \text{ (male)} + 125 \text{ (male)} + 100 \text{ (female)} + 105 \text{ (female)} = 470$

50. Correct Answer : C

Sol 50.

Males				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	230	235	210	190
2000	180	205	160	100
2010	150	165	90	25
2020	140	125	50	5
Females				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	240	225	190	220
2000	210	175	150	120
2010	160	145	100	30
2020	100	105	60	18

The required answer = $90 \text{ (male)} + 100 \text{ (female)} = 190$

51. Correct Answer : B

Sol 51.

Males				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	230	235	210	190
2000	180	205	160	100
2010	150	165	90	25
2020	140	125	50	5

Females				
	10-20	20-30	30-40	40-50
1980	250	250	250	250
1990	240	225	190	220
2000	210	175	150	120
2010	160	145	100	30
2020	100	105	60	18

The number of dead males in 2000 = $1000 - 180 - 205 - 160 - 100 = 355$

The number of dead males in 2000 = $1000 - 210 - 175 - 150 - 120 = 345$

The required ratio = $355 : 345 = 71:69$

52. Correct Answer : B

Sol 52. Levmosto (L), Tyhrmosto (T), Pesmosto (P), and Kitmosto(K)

Using statement 1, 3, 5, and 6

Let the total number of cases on Day 2 be N. So, the number of cases on Day 3 will be N + 1.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	× 0	×3				12
T	× 0	×3				12
P	× 0	×3				5
K	× 0	3				14
Total		N	N + 1			

Using statement 4,

The number of cases for P on the five days must be 2, 1, 1, 1, and 0 in some order.

The number of cases for K on the five days must be 3, 3, 3, 3, and 2 in some order.

The maximum value of sum of cases on Day 5 can be $3 + 3 + 2 + 3 = 11$

Using statement 3,

The only possibility is:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	1	2	3	3	3	12
T	1	2	3	3	3	12
P	1	1	0	1	2	5
K	2	3	3	3	3	14
Total	5	8	9	10	11	43

On all the five days, Levmosto and Tyhrmosto have the same number of new cases.

53. Correct Answer : C

Sol 53. Levpisto (L), Tyhrpisto (T), Pespisto (P), and Kitpisto(K)

Using statement 1, 3, 5, and 6

Let the total number of cases on Day 2 be N. So, the number of cases on Day 3 will be $N + 1$.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	$\times 0$	$\times 3$				12
T	$\times 0$	$\times 3$				12
P	$\times 0$	$\times 3$				5
K	$\times 0$	3				14
Total		N	$N + 1$			

Using statement 4,

The number of cases for P on the five days must be 2, 1, 1, 1, and 0 in some order.

The number of cases for K on the five days must be 3, 3, 3, 3, and 2 in some order.

The maximum value of sum of cases on Day 5 can be $3 + 3 + 2 + 3 = 11$

Using statement 3,

The only possibility is:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	1	2	3	3	3	12
T	1	2	3	3	3	12
P	1	1	0	1	2	5
K	2	3	3	3	3	14
Total	5	8	9	10	11	43

Both the statements are false.

54. Correct Answer : B

Sol 54. Levpisto (L), Tyhrpisto (T), Pespisto (P), and Kitpisto(K)

Using statement 1, 3, 5, and 6

Let the total number of cases on Day 2 be N. So, the number of cases on Day 3 will be $N + 1$.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	$\times 0$	$\times 3$				12
T	$\times 0$	$\times 3$				12
P	$\times 0$	$\times 3$				5
K	$\times 0$	3				14
Total		N	$N + 1$			

Using statement 4,

The number of cases for P on the five days must be 2, 1, 1, 1, and 0 in some order.

The number of cases for K on the five days must be 3, 3, 3, 3, and 2 in some order.

The maximum value of sum of cases on Day 5 can be $3 + 3 + 2 + 3 = 11$

Using statement 3,

The only possibility is:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	1	2	3	3	3	12
T	1	2	3	3	3	12
P	1	1	0	1	2	5
K	2	3	3	3	3	14
Total	5	8	9	10	11	43

Pesmisto did not have any new case on only Day 3.

55. Correct Answer : D

Sol 55. Levmosto (L), Tyhrmosto (T), Pesmisto (P), and Kitmisto(K)

Using statement 1, 3, 5, and 6

Let the total number of cases on Day 2 be N. So, the number of cases on Day 3 will be $N + 1$.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	$\times 0$	$\times 3$				12
T	$\times 0$	$\times 3$				12
P	$\times 0$	$\times 3$				5
K	$\times 0$	3				14
Total		N	$N + 1$			

Using statement 4,

The number of cases for P on the five days must be 2, 1, 1, 1, and 0 in some order.

The number of cases for K on the five days must be 3, 3, 3, 3, and 2 in some order.

The maximum value of sum of cases on Day 5 can be $3 + 3 + 2 + 3 = 11$

Using statement 3,

The only possibility is:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	1	2	3	3	3	12
T	1	2	3	3	3	12
P	1	1	0	1	2	5
K	2	3	3	3	3	14
Total	5	8	9	10	11	43

The number of new cases in Levmosto on Day 3 was exactly 3.

56. Correct Answer : D

Sol 56. Levmosto (L), Tyhrmosto (T), Pesmisto (P), and Kitmisto(K)

Using statement 1, 3, 5, and 6

Let the total number of cases on Day 2 be N . So, the number of cases on Day 3 will be $N + 1$.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	$\times 0$	$\times 3$				12
T	$\times 0$	$\times 3$				12
P	$\times 0$	$\times 3$				5
K	$\times 0$	3				14
Total		N	$N + 1$			

Using statement 4,

The number of cases for P on the five days must be 2, 1, 1, 1, and 0 in some order.

The number of cases for K on the five days must be 3, 3, 3, 3, and 2 in some order.

The maximum value of sum of cases on Day 5 can be $3 + 3 + 2 + 3 = 11$

Using statement 3,

The only possibility is:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
L	1	2	3	3	3	12
T	1	2	3	3	3	12
P	1	1	0	1	2	5
K	2	3	3	3	3	14
Total	5	8	9	10	11	43

The total number of new cases in the city on Day 2 was exactly 8.

57. Correct Answer : C

Sol 57. We have the following table to start with:

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4	x	x		
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

In the vacant cells,

Suresh (S) must have 9, 11, or 12.

Ritesh (R) must have 5, 6, 7, 8, or 9.

Qasim (Q) must have 9 or 11.

Pulak (P) must have 11 or 12.

So, in round 4, Pulak and Qasim must have ₹11.

In round 1, the scores of Ritesh and Suresh did not change (from the initial value of ₹10), so they formed a pair.

Score of Pulak in round 1 must be ₹12.

In round 2, as Pulak's score increased by ₹1, Ritesh's score must have decreased by ₹1 and become ₹9.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PR, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13			₹10	

In round 8, the sum of amounts with Qasim and Ritesh must be $40 - 13 - 10 = 17$ and the only possible values for Qasim and Ritesh are ₹11 and ₹6, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13	₹11	₹6	₹10	

In round 7, Pulak and Suresh must have had ₹12 each, as Pulak could not have had ₹15 in round 7.

In round 5, Pulak and Qasim lost ₹1 each so Ritesh and Suresh must have gained ₹1 each.

So, Suresh must have had ₹12 in round 4.

Ritesh must have had ₹6 and ₹7 in round 4 and round 5, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 1: If PS and RQ were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2: If PQ and RS were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3			₹7	₹10	PQ, RS
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2 is rejected since no possible value for Pulak and Qasim is possible.

In round 6, Qasim must have ₹11 as he can't have ₹9.

Case 1A: The amount with Ritesh decreases by 2 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Case 1B: The amount with Ritesh decreases by 1 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6		₹11	₹6		
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

This case is rejected as no possible value is there for Pulak and Suresh for round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Pulak and Suresh were a pair in Round 5.

58. Correct Answer : 6

Sol 58. We have the following table to start with:

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4	x	x		
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

In the vacant cells,

Suresh (S) must have 9, 11, or 12.

Ritesh (R) must have 5, 6, 7, 8, or 9.

Qasim (Q) must have 9 or 11.

Pulak (P) must have 11 or 12.

So, in round 4, Pulak and Qasim must have ₹11.

In round 1, the scores of Ritesh and Suresh did not change (from the initial value of ₹10), so they formed a pair.

Score of Pulak in round 1 must be ₹12.

In round 2, as Pulak's score increased by ₹1, Ritesh's score must have decreased by ₹1 and become ₹9.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PR, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13			₹10	

In round 8, the sum of amounts with Qasim and Ritesh must be $40 - 13 - 10 = 17$ and the only possible values for Qasim and Ritesh are ₹11 and ₹6, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13	₹11	₹6	₹10	

In round 7, Pulak and Suresh must have had ₹12 each, as Pulak could not have had ₹15 in round 7.

In round 5, Pulak and Qasim lost ₹1 each so Ritesh and Suresh must have gained ₹1 each.

So, Suresh must have had ₹12 in round 4.

Ritesh must have had ₹6 and ₹7 in round 4 and round 5, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 1: If PS and RQ were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2: If PQ and RS were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3			₹7	₹10	PQ, RS
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2 is rejected since no possible value for Pulak and Qasim is possible.

In round 6, Qasim must have ₹11 as he can't have ₹9.

Case 1A: The amount with Ritesh decreases by 2 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Case 1B: The amount with Ritesh decreases by 1 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6		₹11	₹6		
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

This case is rejected as no possible value is there for Pulak and Suresh for round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Number of games were played with a bet of ₹2:

One each in rounds 1, 2, 3, 4, 6, and 8.

59. Correct Answer : 6

Sol 59. We have the following table to start with:

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4	x	x		
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

In the vacant cells,

Suresh (S) must have 9, 11, or 12.

Ritesh (R) must have 5, 6, 7, 8, or 9.

Qasim (Q) must have 9 or 11.

Pulak (P) must have 11 or 12.

So, in round 4, Pulak and Qasim must have ₹11.

In round 1, the scores of Ritesh and Suresh did not change (from the initial value of ₹10), so they formed a pair.

Score of Pulak in round 1 must be ₹12.

In round 2, as Pulak's score increased by ₹1, Ritesh's score must have decreased by ₹1 and become ₹9.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PR, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13			₹10	

In round 8, the sum of amounts with Qasim and Ritesh must be $40 - 13 - 10 = 17$ and the only possible values for Qasim and Ritesh are ₹11 and ₹6, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13	₹11	₹6	₹10	

In round 7, Pulak and Suresh must have had ₹12 each, as Pulak could not have had ₹15 in round 7.

In round 5, Pulak and Qasim lost ₹1 each so Ritesh and Suresh must have gained ₹1 each.

So, Suresh must have had ₹12 in round 4.

Ritesh must have had ₹6 and ₹7 in round 4 and round 5, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 1: If PS and RQ were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2: If PQ and RS were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3			₹7	₹10	PQ, RS
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2 is rejected since no possible value for Pulak and Qasim is possible.

In round 6, Qasim must have ₹11 as he can't have ₹9.

Case 1A: The amount with Ritesh decreases by 2 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Case 1B: The amount with Ritesh decreases by 1 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6		₹11	₹6		
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

This case is rejected as no possible value is there for Pulak and Suresh for round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Ritesh had ₹6.

60. Correct Answer : A

Sol 60. We have the following table to start with:

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4	x	x		
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

In the vacant cells,

Suresh (S) must have 9, 11, or 12.

Ritesh (R) must have 5, 6, 7, 8, or 9.

Qasim (Q) must have 9 or 11.

Pulak (P) must have 11 or 12.

So, in round 4, Pulak and Qasim must have ₹11.

In round 1, the scores of Ritesh and Suresh did not change (from the initial value of ₹10), so they formed a pair.

Score of Pulak in round 1 must be ₹12.

In round 2, as Pulak's score increased by ₹1, Ritesh's score must have decreased by ₹1 and become ₹9.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PR, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13			₹10	

In round 8, the sum of amounts with Qasim and Ritesh must be $40 - 13 - 10 = 17$ and the only possible values for Qasim and Ritesh are ₹11 and ₹6, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13	₹11	₹6	₹10	

In round 7, Pulak and Suresh must have had ₹12 each, as Pulak could not have had ₹15 in round 7.

In round 5, Pulak and Qasim lost ₹1 each so Ritesh and Suresh must have gained ₹1 each.

So, Suresh must have had ₹12 in round 4.

Ritesh must have had ₹6 and ₹7 in round 4 and round 5, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 1: If PS and RQ were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2: If PQ and RS were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3			₹7	₹10	PQ, RS
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2 is rejected since no possible value for Pulak and Qasim is possible.

In round 6, Qasim must have ₹11 as he can't have ₹9.

Case 1A: The amount with Ritesh decreases by 2 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Case 1B: The amount with Ritesh decreases by 1 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6		₹11	₹6		
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

This case is rejected as no possible value is there for Pulak and Suresh for round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Pulak had exactly ₹12.

61. Correct Answer : A

Sol 61. We have the following table to start with:

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4				
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

Pulak and Qasim had the same amount of money with them at the end of Round 4.

	Pulak	Qasim	Ritesh	Suresh
Round 1		₹8	₹10	₹10
Round 2	₹13	₹10		₹8
Round 3				₹10
Round 4	x	x		
Round 5	₹10	₹10		₹13
Round 6				
Round 7		₹12	₹4	
Round 8	₹13			₹10

In the vacant cells,

Suresh (S) must have 9, 11, or 12.

Ritesh (R) must have 5, 6, 7, 8, or 9.

Qasim (Q) must have 9 or 11.

Pulak (P) must have 11 or 12.

So, in round 4, Pulak and Qasim must have ₹11.

In round 1, the scores of Ritesh and Suresh did not change (from the initial value of ₹10), so they formed a pair.

Score of Pulak in round 1 must be ₹12.

In round 2, as Pulak's score increased by ₹1, Ritesh's score must have decreased by ₹1 and become ₹9.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PR, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13			₹10	

In round 8, the sum of amounts with Qasim and Ritesh must be $40 - 13 - 10 = 17$ and the only possible values for Qasim and Ritesh are ₹11 and ₹6, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11			
Round 5	₹10	₹10		₹13	
Round 6					
Round 7		₹12	₹4		
Round 8	₹13	₹11	₹6	₹10	

In round 7, Pulak and Suresh must have had ₹12 each, as Pulak could not have had ₹15 in round 7.

In round 5, Pulak and Qasim lost ₹1 each so Ritesh and Suresh must have gained ₹1 each.

So, Suresh must have had ₹12 in round 4.

Ritesh must have had ₹6 and ₹7 in round 4 and round 5, respectively.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3				₹10	
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 1: If PS and RQ were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2: If PQ and RS were pairs in round 3:

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3			₹7	₹10	PQ, RS
Round 4	₹11	₹11	₹6	₹12	
Round 5	₹10	₹10	₹7	₹13	
Round 6					
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

Case 2 is rejected since no possible value for Pulak and Qasim is possible.

In round 6, Qasim must have ₹11 as he can't have ₹9.

Case 1A: The amount with Ritesh decreases by 2 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Case 1B: The amount with Ritesh decreases by 1 in round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	
Round 6		₹11	₹6		
Round 7	₹12	₹12	₹4	₹12	
Round 8	₹13	₹11	₹6	₹10	

This case is rejected as no possible value is there for Pulak and Suresh for round 6.

	Pulak	Qasim	Ritesh	Suresh	Pair
Round 1	₹12	₹8	₹10	₹10	PQ, RS
Round 2	₹13	₹10	₹9	₹8	PR, QS
Round 3	₹11	₹11	₹8	₹10	PS, RQ
Round 4	₹11	₹11	₹6	₹12	PQ, RS
Round 5	₹10	₹10	₹7	₹13	PS, QR
Round 6	₹12	₹11	₹5	₹12	PR, QS
Round 7	₹12	₹12	₹4	₹12	PS, QR
Round 8	₹13	₹11	₹6	₹10	PQ, RS

Ritesh had exactly ₹6.

62. Correct Answer : B

Sol 62. **Using statements 1 and 2,**

Let the number of non-CS students who took AI and ML be $2k$ and $5k$, respectively.

So, the number of non-CS students who took either AI or ML = $7k$ = the number of CS students

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI					$7k$
	ML					$7k$
Non-CS	AI					$2k$
	ML					$5k$

Using statements 3, 5, and 6,

Let the numbers of non-CS students who failed in AI = the numbers of non-CS students who failed in ML = x

So, the number of CS students who got a C grade in ML = $2x$

Let the number of CS students who got A, B, and C grades in AI be $3y$, $5y$, and $2y$, respectively.

The numbers of CS students who got A, B, and C grades, respectively, in ML will be, $4x$, $5x$, and $2x$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	$4x$	$5x$	$2x$		$7k$
Non-CS	AI	0			x	$2k$
	ML				x	$5k$

Using statement 7,

The number of CS students failing in one of the two courses will be $\frac{2x}{3}$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	3y	5y	2y	0	7k
	ML	4x	5x	2x	$\frac{2x}{3}$	7k
Non-CS	AI	0			x	2k
	ML				x	5k

Using statement 8,

$$x + \frac{2x}{3} = 30$$

$$\text{So, } \frac{5x}{3} = 30$$

$$\text{Hence, } x = 18$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	3y	5y	2y	0	7k
	ML	72	90	36	12	7k
Non-CS	AI	0			18	2k
	ML				18	5k

$$\text{So, } 7k = 72 + 90 + 36 + 12 = 210$$

$$k = 30,$$

$$\text{Also, } 3y + 5y + 2y = 210$$

$$y = 21$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0			18	60
	ML				18	150

Using statement 4,

$$\text{Number of non-CS students who got grade C} = 63 - 42 = 21$$

$$\text{Number of non-CS students who got grade B} = 60 - 18 - 21 = 21$$

$$\text{Total number of ML students who got grade B} = \frac{72 + 90 + 36 + 150 - 18}{2} = 165$$

$$\text{Number of non-CS ML students who got grade B} = 165 - 90 = 75$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML		75		18	150

Number of non-CS ML students who got grade A + Number of non-CS ML students who got grade C
 $= 150 - 75 - 18 = 57$

Let the number of non-CS ML students who got grade A be a. Then, the number of non-CS ML students who got grade C = $57 - a$

Number of ML students who got grade A: Number ML students who got grade C = 3:2

$$\text{So, } \frac{72 + a}{36 + 57 - a} = \frac{3}{2}$$

$$144 + 2a = 279 - 3a$$

$$5a = 135, a = 27$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML	27	75	30	18	150

75 non-CS students got the B grade in ML.

63. Correct Answer : A

Sol 63. **Using statements 1 and 2,**

Let the number of non-CS students who took AI and ML be 2k and 5k, respectively.

So, the number of non-CS students who took either AI or ML = $7k$ = the number of CS students

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI					7k
	ML					7k
Non-CS	AI					2k
	ML					5k

Using statements 3, 5, and 6,

Let the numbers of non-CS students who failed in AI = the numbers of non-CS students who failed in ML = x

So, the number of CS students who got a C grade in ML = $2x$

Let the number of CS students who got A, B, and C grades in AI be 3y, 5y, and 2y, respectively.

The numbers of CS students who got A, B, and C grades, respectively, in ML will be, 4x, 5x, and 2x.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	3y	5y	2y	0	7k
	ML	4x	5x	2x		7k
Non-CS	AI	0			x	2k
	ML				x	5k

Using statement 7,

The number of CS students failing in one of the two courses will be $\frac{2x}{3}$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	3y	5y	2y	0	7k
	ML	4x	5x	2x	$\frac{2x}{3}$	7k
Non-CS	AI	0			x	2k
	ML				x	5k

Using statement 8,

$$x + \frac{2x}{3} = 30$$

$$\text{So, } \frac{5x}{3} = 30$$

$$\text{Hence, } x = 18$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	3y	5y	2y	0	7k
	ML	72	90	36	12	7k
Non-CS	AI	0			18	2k
	ML				18	5k

$$\text{So, } 7k = 72 + 90 + 36 + 12 = 210$$

$$k = 30,$$

$$\text{Also, } 3y + 5y + 2y = 210$$

$$y = 21$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0			18	60
	ML				18	150

Using statement 4,

$$\text{Number of non-CS students who got grade C} = 63 - 42 = 21$$

$$\text{Number of non-CS students who got grade B} = 60 - 18 - 21 = 21$$

$$\text{Total number of ML students who got grade B} = \frac{72 + 90 + 36 + 150 - 18}{2} = 165$$

$$\text{Number of non-CS ML students who got grade B} = 165 - 90 = 75$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML		75		18	150

$$\text{Number of non-CS ML students who got grade A} + \text{Number of non-CS ML students who got grade C} = 150 - 75 - 18 = 57$$

Let the number of non-CS ML students who got grade A be a . Then, the number of non-CS ML students who got grade C = $57 - a$

$$\text{Number of ML students who got grade A} : \text{Number ML students who got grade C} = 3:2$$

$$\text{So, } \frac{72 + a}{36 + 57 - a} = \frac{3}{2}$$

$$144 + 2a = 279 - 3a$$

$$5a = 135, a = 27$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML	27	75	30	18	150

63 students got the A grade in AI.

64. Correct Answer : 27

Sol 64. **Using statements 1 and 2,**

Let the number of non-CS students who took AI and ML be $2k$ and $5k$, respectively.

So, the number of non-CS students who took either AI or ML = $7k$ = the number of CS students

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI					$7k$
	ML					$7k$
Non-CS	AI					$2k$
	ML					$5k$

Using statements 3, 5, and 6,

Let the numbers of non-CS students who failed in AI = the numbers of non-CS students who failed in ML = x

So, the number of CS students who got a C grade in ML = $2x$

Let the number of CS students who got A, B, and C grades in AI be $3y$, $5y$, and $2y$, respectively.

The numbers of CS students who got A, B, and C grades, respectively, in ML will be, $4x$, $5x$, and $2x$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	$4x$	$5x$	$2x$		$7k$
Non-CS	AI	0			x	$2k$
	ML				x	$5k$

Using statement 7,

The number of CS students failing in one of the two courses will be $\frac{2x}{3}$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	$4x$	$5x$	$2x$	$\frac{2x}{3}$	$7k$
Non-CS	AI	0			x	$2k$
	ML				x	$5k$

Using statement 8,

$$x + \frac{2x}{3} = 30$$

$$\text{So, } \frac{5x}{3} = 30$$

Hence, $x = 18$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	72	90	36	12	$7k$
Non-CS	AI	0			18	$2k$
	ML				18	$5k$

So, $7k = 72 + 90 + 36 + 12 = 210$

$k = 30$,

Also, $3y + 5y + 2y = 210$

$y = 21$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0			18	60
	ML				18	150

Using statement 4,

Number of non-CS students who got grade C = $63 - 42 = 21$

Number of non-CS students who got grade B = $60 - 18 - 21 = 21$

Total number of ML students who got grade B = $\frac{72 + 90 + 36 + 150 - 18}{2} = 165$

Number of non-CS ML students who got grade B = $165 - 90 = 75$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML		75		18	150

Number of non-CS ML students who got grade A + Number of non-CS ML students who got grade C = $150 - 75 - 18 = 57$

Let the number of non-CS ML students who got grade A be a. Then, the number of non-CS ML students who got grade C = $57 - a$

Number of ML students who got grade A: Number ML students who got grade C = 3:2

$$\text{So, } \frac{72 + a}{36 + 57 - a} = \frac{3}{2}$$

$$144 + 2a = 279 - 3a$$

$$5a = 135, a = 27$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML	27	75	30	18	150

27 non-CS students got the A grade in ML.

65. Correct Answer : 12

Sol 65. **Using statements 1 and 2,**

Let the number of non-CS students who took AI and ML be 2k and 5k, respectively.

So, the number of non-CS students who took either AI or ML = $7k$ = the number of CS students

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI					7k
	ML					7k
Non-CS	AI					2k
	ML					5k

Using statements 3, 5, and 6,

Let the numbers of non-CS students who failed in AI = the numbers of non-CS students who failed in ML = x

So, the number of CS students who got a C grade in ML = $2x$

Let the number of CS students who got A, B, and C grades in AI be $3y$, $5y$, and $2y$, respectively.

The numbers of CS students who got A, B, and C grades, respectively, in ML will be, $4x$, $5x$, and $2x$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	$4x$	$5x$	$2x$		$7k$
Non-CS	AI	0			x	$2k$
	ML				x	$5k$

Using statement 7,

The number of CS students failing in one of the two courses will be $\frac{2x}{3}$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	$4x$	$5x$	$2x$	$\frac{2x}{3}$	$7k$
Non-CS	AI	0			x	$2k$
	ML				x	$5k$

Using statement 8,

$$x + \frac{2x}{3} = 30$$

$$\text{So, } \frac{5x}{3} = 30$$

$$\text{Hence, } x = 18$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	$7k$
	ML	72	90	36	12	$7k$
Non-CS	AI	0			18	$2k$
	ML				18	$5k$

$$\text{So, } 7k = 72 + 90 + 36 + 12 = 210$$

$$k = 30,$$

$$\text{Also, } 3y + 5y + 2y = 210$$

$$y = 21$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0			18	60
	ML				18	150

Using statement 4,

Number of non-CS students who got grade C = $63 - 42 = 21$

Number of non-CS students who got grade B = $60 - 18 - 21 = 21$

Total number of ML students who got grade B = $\frac{72 + 90 + 36 + 150 - 18}{2} = 165$

Number of non-CS ML students who got grade B = $165 - 90 = 75$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML		75		18	150

Number of non-CS ML students who got grade A + Number of non-CS ML students who got grade C = $150 - 75 - 18 = 57$

Let the number of non-CS ML students who got grade A be a. Then, the number of non-CS ML students who got grade C = $57 - a$

Number of ML students who got grade A: Number ML students who got grade C = 3:2

$$\text{So, } \frac{72 + a}{36 + 57 - a} = \frac{3}{2}$$

$$144 + 2a = 279 - 3a$$

$$5a = 135, a = 27$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML	27	75	30	18	150

12 CS students failed in ML.

66. Correct Answer : C

Sol 66. **Using statements 1 and 2,**

Let the number of non-CS students who took AI and ML be $2k$ and $5k$, respectively.

So, the number of non-CS students who took either AI or ML = $7k$ = the number of CS students

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI					7k
	ML					7k
Non-CS	AI					2k
	ML					5k

Using statements 3, 5, and 6,

Let the numbers of non-CS students who failed in AI = the numbers of non-CS students who failed in ML = x

So, the number of CS students who got a C grade in ML = $2x$

Let the number of CS students who got A, B, and C grades in AI be $3y$, $5y$, and $2y$, respectively.

The numbers of CS students who got A, B, and C grades, respectively, in ML will be, $4x$, $5x$, and $2x$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	7k
	ML	$4x$	$5x$	$2x$		7k
	AI	0			x	2k
Non-CS	ML				x	5k

Using statement 7,

The number of CS students failing in one of the two courses will be $\frac{2x}{3}$.

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	7k
	ML	$4x$	$5x$	$2x$	$\frac{2x}{3}$	7k
	AI	0			x	2k
Non-CS	ML				x	5k

Using statement 8,

$$x + \frac{2x}{3} = 30$$

$$\text{So, } \frac{5x}{3} = 30$$

$$\text{Hence, } x = 18$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	$3y$	$5y$	$2y$	0	7k
	ML	72	90	36	12	7k
Non-CS	AI	0			18	2k
	ML				18	5k

$$\text{So, } 7k = 72 + 90 + 36 + 12 = 210$$

$$k = 30,$$

$$\text{Also, } 3y + 5y + 2y = 210$$

$$y = 21$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0			18	60
	ML				18	150

Using statement 4,

$$\text{Number of non-CS students who got grade C} = 63 - 42 = 21$$

$$\text{Number of non-CS students who got grade B} = 60 - 18 - 21 = 21$$

$$\text{Total number of ML students who got grade B} = \frac{72 + 90 + 36 + 150 - 18}{2} = 165$$

$$\text{Number of non-CS ML students who got grade B} = 165 - 90 = 75$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML		75		18	150

$$\text{Number of non-CS ML students who got grade A} + \text{Number of non-CS ML students who got grade C} = 150 - 75 - 18 = 57$$

Let the number of non-CS ML students who got grade A be a . Then, the number of non-CS ML students who got grade C = $57 - a$

$$\text{Number of ML students who got grade A: Number ML students who got grade C} = 3:2$$

$$\text{So, } \frac{72 + a}{36 + 57 - a} = \frac{3}{2}$$

$$144 + 2a = 279 - 3a$$

$$5a = 135, a = 27$$

Dept.	Courses	Grade				Total
		A	B	C	F	
CS	AI	63	105	42	0	210
	ML	72	90	36	12	210
Non-CS	AI	0	21	21	18	60
	ML	27	75	30	18	150

$$\text{Number of students who took AI} = 210 + 60 = 270$$