T.I.M.E.
Triumphant Institute of
Management Education Pvt. Ltd

Ref: AIMCAT2023

INSTRUCTIONS

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.

2. This test has a total of 100 questions in three sections: (i) Verbal Ability and Reading Comprehension –34 Questions (ii) Data Interpretation and Logical Reasoning –32 Questions and (iii) Quantitative Ability –34 Questions. The total time available for the test is **180 minutes**. However, you will be allotted exactly 60 minutes for answering the questions in each section and you cannot switch from one section to another while answering the questions in a section.

3. All questions carry three marks each. Each wrong answer to any multiple-choice type question will attract a penalty of one mark. Wrong answers to any non multiple-choice type question will not attract any penalty.

SECTION –I
Number of Questions = 34

DIRECTIONS *for questions 1 to 5:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

Alongside the number of ivory trading bans put in place over the last several years, it looks like nature has taken matters into its own hands, as a number of elephants have evolved to lose their tusks following decades of ivory poaching.

It's a finding that adds to Darwin's theory of natural selection. During the Mozambican Civil War – which raged from 1977 to 1992 – 90 percent of the 4,000 elephants at the nation's Gorongosa National Park were killed so that their ivory could be used to exchange for weapons and their meat to feed soldiers.

Fast forward to the present day and research conducted ... [shows] that around a third of the females from the generation born after the war ended are tuskless – a trait that appears to have been passed on from the adults who survived the war and are tuskless themselves.

Normally only around two to four percent of female African elephants would be born without tusks, so this is quite the jump. Dominique D'Emille Correia Gonçalves, a PhD student from the University of Kent who is part of a team of scientists investigating the findings, told the Daily Mail: "Ivory poaching targets big tusked animals, so it removes the 'big tusk' gene out of the population."

The elephant population today is derived from most of the elephants who survived the war, where they were heavily poached for their tusks...

The key explanation is that in Gorongosa National Park, the tuskless elephants were the ones which eluded poaching during the civil war and passed this trait onto many of their daughters...

These tuskless elephants are growing from the survivors of poaching so while we are not talking about evolution yet, we could be talking about the removal of certain genes from the population.

In addition to the changes in tusk development, Joyce's research also discovered what's described as a 'culture of aggression' amongst the female elephants, which is believed to be due to their need to protect their young during the war.

Dominique described the 'culture of aggression' as 'intriguing', adding: "This is a big change, as anecdotal records from people that have been in Gorongosa before the war suggest the family units used to be calm and almost indifferent to people presence.

"Many of the matriarchs and lead females of the family units were alive during the slaughter and saw their families and friends being hunted...

"They are survivors and the trauma is still present, which would explain such intolerance to humans."

Despite the wave of [human-influenced] tusklessness in recent decades, elephants missing their tusks are surviving and appear healthy, according to Poole. Tusks are essentially overgrown teeth. Yet they're typically used for most tasks of daily living: digging for water or vital minerals in the ground, debarking trees to secure fibrous food, and helping males compete for females.

The work elephants do with their tusks is vital for other animals too. Elephants' "role as a keystone species to topple trees and dig holes to access water is important for a variety of lower species that depend on them," Long says. Tusk action also helps create habitats. Certain lizards, for example, prefer to make their homes in trees roughed up or knocked over by browsing elephants. If elephants are changing where they live, how quickly they move, or where they go, it could have larger implications for the ecosystems around them.

1. The effect of poaching on elephants is that:
   (A) elephants have lost their ability to grow tusks.
   (B) elephants with the gene responsible for the big tusk have gone extinct.
   (C) elephants have evolved to avoid growing tusks.
   (D) elephants without tusks are evolving in number.

2. Which of the following has NOT been mentioned by the author to highlight the impact of elephant tusklessness?
   (A) Elephants without tusks unable to survive.
   (B) Habitats of animal species dependent on elephants.
   (C) Male elephants competing for females.
   (D) Dietary habits of elephants.

3. The 'culture of aggression' discovered amongst the elephants points to:
   (A) the adverse effect of trauma on elephant genes.
   (B) an increase in the number of tuskless elephants.
   (C) the inherent friendly nature of elephants towards humans.
   (D) the influence of trauma on elephant aggression.

4. Which of the following studies is the author least likely to recommend in the future?
   (A) A study of the health patterns of the tuskless elephants. (appearing healthy is different from being healthy)
   (B) A study of the effect of poaching on tuskless elephants.
   (C) A study of the changes in ecosystems around tuskless elephants.
   (D) A study of the effect of tuskless elephants on the ecosystem around them.

5. The author mentions Darwin's theory of natural selection to probably show that:
   (A) tuskless elephants survived the civil war because they were the fittest.
   (B) nature propagates genes found in surviving species.
   (C) animal species evolve towards the genes of the surviving species.
   (D) nature selects some species to thrive and some to perish.

DIRECTIONS *for questions 6 to 10:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

Tokyo is the real international capital of fashion. Not Paris, which has claimed the title for decades; not New York; which clings to its market domination for the crown; not even Milan, where industrialists make the business an art.

Being the capital of fashion isn't about who has the boutiques or the runway shows... To be the true capital of fashion, fashion must dominate everything. It must be the passion of the masses and the connoisseurs. It must be the primary mode of expression beyond art, film, music. It must be a place where fashion is treated as a necessity, not a luxury. And that is Tokyo, a city where -- outside the most obscure underground shops -- lines form for the latest T-shirt. It's the only city in the world where creating fashion is treated as an intellectual pastime. Ask who the greatest living artist in Tokyo is, and a surprising number of people won't name a writer or a painter; they'll name Rei Kawakubo. Or Junya Watanabe. Fashion designers.

Tokyo is the capital of fashion because, from the cheapest pair of jeans to the most overpriced, misunderstood designer masterpiece, it inspires 'otaku' in the population. 'Otaku' is the best word to learn first before going to Tokyo. Otaku was once a derogatory term used to describe someone who is so consumed by a subject that he risks becoming a shut-in. But now otaku means "deep passion." About anything.

"Every hipster who goes to Tokyo comes back learning two words: kwaii, which means 'cute' and otaku, which means 'obsessive,'" says the pop conceptual artist Tom Sachs. "The thing that's interesting is when you combine those two things."

People who pride themselves on their otaku can discern the slightest alterations in design...[allowing] fashion designers [to] change a trim from orange to blue and sell yet another. Lines formed for days when the largest Louis Vuitton store in the world opened in Tokyo a few months ago; understanding the culture intimately, the company offered a series of limited-edition pieces for the event.

Unlike with the London punks and mods, or the New York rappers who so inspire dress in the streets of Japan's capital, there are no politics behind the Tokyo fashion movements. The punk movement, when it came, was only about fashion. The hip-hop movement has nothing to do with rebellion. 'Boystyle' has nothing to do with women's rights. If you ask the girls why they're wearing it, it's because "it's cute." What are all those sartorial movements without anger? Well, they're happy clothes. They're kwaii. They're divested of all of their meaning. As central as fashion is to life here, all it really says is that the person wearing it loves fashion. Even Watanabe professes distress that his spring collection of sweet florals and hippie denims was deemed comforting to the post-Sept. 11 audience. He wanted them to be judged only as the art he believes they are.

In Tokyo, fashion, after all, is used to existing without political context. There's little street crime and no visible underclass, and the only thing to rebel against is the work ethic. And the young generation has been criticized for doing just that, although their posing in the streets has become its own kind of performance art, their dress colouring the world around them and defining Japanese culture more than any other movement in the city.

6. Which of the following can be inferred from the penultimate para of the passage?
   (A) Hip-hop and punk started more as rebellions than as fashion statements in Tokyo.
   (B) Tokyo fashion felicitates the underlying connection between Boystyle and women's rights.
   (C) Watanabe was upset post-Sept. 11 audience loved his florals and denims for their art.
   (D) Tokyo fashion has stripped sartorial movements of their anger.

7. Which of the following best explains the purpose of the author's mention of Kawakubo and Watanabe in para 2 of the passage?
   (A) To show that fashion designers are celebrities in Tokyo.
   (B) To debate who the greatest living artist in Tokyo is.
   (C) To demonstrate how Tokyo regards fashion designers as artists.
   (D) To prove that with artistic fashion designers, Tokyo is the capital of fashion.

8. Which of the following, if true, least fits with the meaning of 'otaku' as explained in the passage?

(A) Fans stand in lines sometimes for days to obtain movie tickets for movies of their favourite heroes.
(B) Comic-book fans generally do not miss even the smallest deviations in movies from the usual storylines.
(C) Wine connoisseurs can distinguish between wines from different vineyards.
(D) Hipsters in Tokyo trust brands and fashion designers too much to notice the detailing.

9. People of Tokyo who pride themselves on their otaku benefit the fashion designers by allowing them to:
   (A) create new lines with the subtlest of changes.
   (B) cash-in on limited-edition pieces.
   (C) be more unconventional in their designs.
   (D) be more passionate about their work.

10. The author's main argument in the passage is contradicted by which of the following statements:
    (A) It is not otaku but commerce that decides the fashion capital.
    (B) Fashion reflects a culture better than its art, film and music.
    (C) Fashion should be an intellectual pastime in the fashion capital of the world.
    (D) The fashion capital should boast of the most passionate fashionistas.

DIRECTIONS *for questions 11 to 15:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

In a paper presented to the newly formed Royal Society... Christopher Merrett – a scientist, physician, naturalist and metallurgist [who in 1662 first documented "how to put the fizz into sparkling wine"] – ...described how English winemakers had been adding sugar to wines to give them a refreshing, bubbly quality – 30 years before a monk in France's Champagne region.

"Our wine coopers of recent times use vast quantities of sugar and molasses to all sorts of wines to make them drink brisk and sparkling and to give them spirit," he wrote. It was the first time anyone had described the process or used the word "sparkling" to describe the end-product, Winchcombe historian Jean Bray said. What he was actually describing was the result of secondary fermentation...

[So], is sparkling wine better in England than France? At the Three Choirs Vineyard near Newent in Gloucestershire, winery manager Keith Shayle explained the process, which starts with fermenting the grape juice in a vat to make a conventional wine.

"To turn a still wine into a sparkling wine we put what we call the base wine into a champagne bottle with some priming sugar and yeast, put a cap on the bottle, and allow it to ferment inside," he said.

"This means the carbon dioxide can't escape, so it's retained in the wine in the bottle and that gives you the bubbles when we take the top off. That's the second fermentation, in the bottle itself."

These days it is a hi-tech business. Fermentation in the bottle produces not only carbon dioxide but also a yeasty sediment which has to be removed – a process known as disgorging. The bottles are stacked on their sides on a pallet, which over the space of several days is gradually rotated until the bottles are facing downwards. Sediment collects as a deposit in the neck of the bottle, which is then dipped in a glycol solution to freeze the contents, before the bottle is fed into a disgorging machine which flicks off its temporary metal closure.

Pressure from the gas inside the bottle – roughly three times higher than a car's tyres – shoots the little plug of ice containing the sediment out with a satisfying pop and a brief effervescence. The machine then adds a small amount of dosage – a sweet, syrupy wine concentrate which improves the final taste – before sealing the bottle once again with a cork in a muselet, or wire cage.

For French winemakers, secondary fermentation was a menace. The build-up of gas caused their rather flimsy glass bottles to explode – and when one went bang it could set off its neighbours as well, devastating entire cellars. But for English winemakers, secondary fermentation and the magic it added was a boon, not a burden. Their wine bottles were heavier and thicker – like modern champagne bottles – so much less likely to explode. Apparently, the Royal Navy is to thank for that. Early modern glassmakers used charcoal made from oaks to heat their furnaces, but the navy banned the use of oak for anything other than shipbuilding. English glassmakers turned to coal instead, and discovered it burned hotter and allowed them to make stronger glass.

It transpires therefore, that English sparkling wine has a long history – longer even than champagne.

11. Base wine is transformed into sparkling wine in England by:
(A) adding priming sugar and yeast to it.
(B) adding carbon dioxide and sealing it in a bottle.
(C) adding a wine concentrate and then sealing the bottle.
(D) leaving the grape juice in a vat.

12. The process of disgorging can best be explained as:
(A) Fermentation in the bottle to produce conventional wine.
(B) Secondary fermentation in the bottle to produce sparkling wine.
(C) Collection of sediments as deposits in the neck of the bottle.
(D) Separation of yeasty sediment after secondary fermentation.

13. The Royal Navy helped the cause of English winemakers by:
(A) enforcing the use of thicker glass that allowed better secondary fermentation.
(B) enforcing the use of coal, which helped in making stronger glass needed for secondary fermentation.
(C) banning the use of oak, resulting in coal being used in furnaces.
(D) banning use of thinner bottles that exploded in cellars.

14. The author's main argument in the passage is that:
(A) The English winemakers use a better method of producing sparkling wine than their French counterparts do.
(B) The English winemakers produced champagne long before the French did.
(C) The English knew about sparkling wine before the French made champagne.
(D) The English winemakers created the method of producing bubbles in wine that the French now use to make champagnes.

15. Secondary fermentation could be perilous if:
(A) glycol solution used to freeze contents is contaminated.
(B) glass used for bottles isn't strong.
(C) most of the effervescence is lost during disgorging.
(D) bottles weren't strong enough to stop gas from building up inside.

DIRECTIONS *for questions 16 to 20:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

I cannot resist a literary analogy. (To a close approximation), Dickens and Salinger use the same few thousand words in their respective novels *David Copperfield* and *Catcher in the Rye.* There are words that Salinger uses but not Dickens, and vice versa. But these words are few compared with the words they share. Though there is 90% lexical concordance between the two books, they are different books. The difference lies not in the use of a different set of words, but in the same set of words used in a different pattern and order. ... [Likewise], it has been known since long that some genes move from one species to other widely different species given the chance, in a process called horizontal gene transfer [eg., genes for antibiotic resistance swap freely between bacterial species].

Alastair and Boschetti [of Cambridge University] report in *Genome Biology* that humans have atleast 145 genes picked up from other species by their forebears. Though this is less than 1% of the 20,000 genes that humans have altogether, humans are (to a small degree) part bacterium, part fungus and part alga.

The researchers concluded this by looking at public databases of genetic information now available. They studied humans and nine other primates, twelve types of fruit fly and four nematode worms. The results from all three groups suggest natural transgenics is ubiquitous.

To avoid getting bogged down in the billions of base pairs of an animal genome, the researchers looked at the transcriptome [the set of messenger molecules, made of a DNA-like chemical called RNA, that pick up instructions on how to make proteins from genes in the nucleus and deliver them to the subcellular factories which turn those proteins out]. Each type of messenger RNA corresponds to a single gene. By looking at the messengers, the researchers could ascertain they were recording active genes and not stretches of nuclear DNA that had once been genes but now no longer work.

For every transcribed messenger, they searched the world's databases, looking for matches. They excluded the immediate relatives of each of the three groups of animals (i.e., no arthropods were compared with flies, no vertebrates with primates and no other nematodes with worms). They asked whether similar-looking genes to those in a transcriptome were found more often in other animals, or in non-animals. If the latter, then, a horizontal gene transfer from species to species seemed probable. On average, worms had 173 horizontally transferred genes, flies had 40 and primates had 109. Humans thus had more than the primate mean.

Many matches are to genes of unknown purpose [even 15 years after the human genome project, the functions of many genes remain obscure]. But some human transgenes appear familiar. The ABO antigen system, which defines basic blood groups for transfusion purposes, looks bacterial. The fat-mass and obesity-associated gene comes from marine algae. Genes involved in the synthesis of hyaluronic acid originate from fungi.

The researchers found two imported genes for amino-acid metabolism, thirteen for fat metabolism, fifteen for post-manufacture modification of large molecules .... and seven immune-system genes.

Quite a catalogue! If anything similar were inserted by genetic engineers into corn or cattle, there would be an outcry (opponents of genetically modified crops complain that moving genes between species is unnatural). In humans, however, they are doing a good job. Many of them have been cohabiting with the line that led to humanity for millions of years, and both sides have had ample time to adjust.

16. Which of the following choices best encapsulates the author's central argument in the passage?
    (A) Certain genes are interchangeable between species.
    (B) Human beings have routinely picked up genes from other species.
    (C) Horizontal gene transfer is a relatively new phenomenon in human beings.
    (D) Moving genes between species of crops or cattle is opposed by genetic engineers.

17. If it were confirmed that "similar-looking genes to those in a transcriptome (under study) were found more often in other animals" (para 5), then the explanation for this is ...
    (A) that the genes were there by common descent from animal ancestors.
    (B) that horizontal gene transfer definitely occurred from species to species.
    (C) that genes that once worked have now been converted to stretches of nuclear DNA.
    (D) not inferrable from the passage.

18. Which of the following explains the purpose for the author's mention of the examples of the ABO antigen system and other genes in para 6?
    (A) To point out that the role of several transgenes still remains unclear.
    (B) To reiterate that peculiarities of lesser organisms have now been found in humans too.
    (C) To demonstrate that certain transgenes swapped from other species to humans in exchange for non-active genes.

(D) To indicate that certain transgenes associated with familiar functions have moved from other species to humans.

19. Which of the following would undermine the main finding of the passage?
    (A) A study affirming that natural transgenics is quite widespread in the human and non-human worlds.
    (B) A study highlighting the criticality of transgenes in evolutionary mechanisms.
    (C) A study confirming that all the genes of humans have been transferred and preserved intact from the genomes of their long-extinct ancestors.
    (D) A study indicating the necessity of labelling or tightly regulating the use of genetically modified organisms in agriculture and industry.

20. Based on information provided in the passage, all of the following choices can be refuted EXCEPT?
    (A) The transcriptome has stretches of non-nuclear DNA code that activates certain genes and it plays an instructional role in species.
    (B) The difference between Dicken's novel and Salinger's novel is because of the lexical concordance between the two books.
    (C) Immigrant genes from non-human species have started cohabiting with the line that led to humanity in the recent past.
    (D) Dickens and Salinger have, in the novels mentioned, made use of a large number of same words in different contexts to different effect.

DIRECTIONS *for questions 21 to 24:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

The wealthiest Americans have grown wealthier since the Great Recession, and many are investing their wealth in art. Especially with bonds and other assets offering rock-bottom yields, the art market — where reports of record-high sales now emerge regularly — has an obvious appeal. According to a survey last year by Deloitte and ArtTactic, an art-research firm, 76 percent of art buyers viewed their acquisitions as investments, compared with 53 percent in 2012. And with more collectors viewing art as a financial investment, storage can become an artwork's permanent fate.

Benefiting from this is an upstart art-storage company called Uovo. Uovo is built from scratch, a modern facility with "Mission: Impossible"-grade security and bespoke technology for cataloguing artworks that makes information about them readily available to interested buyers. The complex will be packed with thousands of works of art, from old masters to contemporary rising stars. But unlike at a museum, few will ever see the works that live inside it.

Largely hidden from public view, an ecosystem of service providers has blossomed too, as Wall Street-style investors and other new buyers have entered the market. These service companies, profiting on the heavy volume of deals while helping more deals take place, include not only art handlers and advisers but also tech start-ups like ArtRank, which uses an algorithm to place emerging artists into buckets including "buy now," "sell now" and "liquidate."

Collectors have not always been so willing to consign their new acquisitions to storage. Near the end of his life, Henry Clay Frick, the 19th-century industrialist, built a mansion on Fifth Avenue in Manhattan to house his art collection. In 1945, the oil baron J. Paul Getty bought a seaside home near Malibu that he filled with art, later opening the house periodically to the public. To be sure, these men weren't inviting the masses into their homes while they were alive — but they did hang their art, which was the fruit of their wealth, not its source.

One prominent artist, who insisted on anonymity, says that the growth of art-storage companies demonstrates "something about the way art is functioning, which is less about the artwork saying something or doing something and more about the artwork representing a value."

21. The last line of the penultimate para ('To be sure... not its source') summarises the paradigm shift in perception towards art by stating:
    (A) Earlier, people earned money from art; now they earn money to buy art.
    (B) Art was a reward for earning wealth; now art can be a source of wealth.
    (C) Earlier, art had an aesthetic appeal; now it does not.
    (D) Art was rewarding earlier, but not anymore.

22. Storage can become an artwork's permanent fate, according to the author, because:
    (A) Art is not pursued for the value it represents but for what it says.
    (B) Art collectors view artwork as financial investments.
    (C) Investing in the art market is extremely lucrative.
    (D) There has been an increase in the intrinsic value of art.

23. All the following support the sentiment of 'artwork representing a value' (as mentioned in the last line of the passage) EXCEPT:
    (A) J. Paul Getty bought a seaside home near Malibu that he filled with art.
    (B) ArtRank places emerging artists into buckets including "buy now," "sell now" and "liquidate."
    (C) Uovo has built a modern facility with bespoke technology for cataloguing artworks.
    (D) 76 percent of art buyers viewed their acquisitions as investments, compared with 53 percent in 2012.

24. The author's central argument in the passage can be confirmed by which of the following hypothetical statements:
    (A) It is impossible to put a price tag on every artwork existing currently.
    (B) The valuation of art is an extremely subjective affair.
    (C) Fewer and fewer art works are put up for public display and are, instead, stored in vaults.
    (D) Those who invest in art are reluctant to let others enjoy it.

DIRECTIONS *for question 25*: The sentences given in the question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

25. (1) For an awful moment I have no idea where I am, then it comes to me in a sick, fearful wave.
    (2) I am not sure if I dreamed it.
    (3) I work my way up against pillows and can tell through drawn curtains that the sun is aloof again, offering nothing but grey.

(4) I wake up the following morning to voices in the house and have the unsettling sensation that the telephone rang all night.

DIRECTIONS *for question 26*: Five sentences related to a topic are given in the question below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

26. (1) People may not at first appreciate the honest confrontational experiences such a stance might generate.
    (2) When you defend those who are absent, you retain the trust of those present.
    (3) Confrontation takes considerable courage, and many people would prefer to take the course of least resistance – belittling, criticizing, betraying confidences and gossiping.
    (4) Integrity in an interdependent reality is simply this: you treat everyone by the same set of principles.
    (5) But in the long run, people will trust and respect you if you are honest, open and kind with them.

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

27. In agriculture, as in other sectors, policies should promote the efficient use of resources and ensure that prices reflect their scarcity and the cost of environmental impacts. An area requiring urgent action is removal or reform of incentives harmful to biodiversity (for e.g. tax reduction or exemption on fuels for fishing vessels or subsidies for products driving forest cover loss). So far, few countries have taken steps towards identifying incentives to be tackled.
    (A) Only a few countries are trying to preserve biodiversity through immediate identification of incentives for the efficient use of resources.
    (B) Tax reduction or exemption, on fuels for fishing vessels, and subsidies for products driving forest cover loss, should be avoided to preserve biodiversity.
    (C) Governments must immediately curtail incentives which prove to be a threat to scarce resources.
    (D) Governments aren't taking steps to reform agriculture incentives harmful to biodiversity.

28. (1) Moreover, Germany has not escaped the trends that other Western economies have experienced during the past several decades – in particular a dramatic rise in inequality.
(2) In reality, it is as imbalanced as most other advanced economies and it has significant weaknesses.
(3) To the extent that the German economy has been successful, it is partly because it has benefited from an undervalued currency since the creation of the euro.
(4) During the past decade, the German economy has been widely seen as a model.

29. (1) Sovereign democracies must constantly change their minds in foreign relations, economics, and national security to make these policies align with the domestic necessities of the moment rather than more unmoving national interests.
(2) The main flaw of the sovereign democracy model is the rampant inbuilt corruption and erosion of institutions, which ultimately leads to stagnation and decay.
(3) This is the main reason it is hard for Turkey to remain a strategic partner of the United States.
(4) As long as the United States has no strategic interest in the survival of the regime in Turkey, it remains impossible for these two countries to share a common language of cooperation.
(5) Turkey's parameters are constantly changing, and there is no long-term predictability.

30. Circadian rhythms influence important bodily functions. The suprachiasmatic nucleus (SCN) of the brain hypothalamus is the master clock that controls the internal clocks of different cell types. Microscopic imaging of astrocytes – star-shaped cells that surround and support neurons of the SCN – and neurons of the SCN have shown that although both types of cells have their own circadian clocks, they are differently regulated and are seen to be active at different times of the day. This delicate interplay is critical in keeping the entire SCN clockwork ticking. Scientists also found that mice genetically altered to silence their internal body clock showed disruption to their SCN function and behaviour. They now observe that restoration of a genetically functional clock in astrocytes alone enabled the mice to regulate their daily activity. Astrocytes could restart the circadian function of neurons. This meant that even when astrocytes were the only cell in an animal with a working internal clock, they were capable of controlling animal behaviour to their own cell-specific tune.

(A) Astrocytes were thought to be mere support cells to neurons but they can actually control human behaviour.
(B) Microscopic imaging to observe the internal molecular clock timing of the SCN astrocytes and neurons show that working astrocytes convey time cues to their clockless neuronal partners.
(C) The discovery that the star-shaped astrocytes can be as effective as neurons in generating and transmitting a circadian timing signal across an animal has surprised scientists.
(D) Astrocytes, which support neurons of the SCN in regulating circadian rhythms, can lead the tempo of the body's internal clock and can solely control patterns of daily behaviour in mice.

31. (1) But its raw material, too, comes from a mine in Congo, majority-owned by a Chinese firm, China Molybdenum.
(2) It is widely known that more than half of the world's cobalt reserves and production are in one dangerously unstable country, the Democratic Republic of Congo.
(3) Much of the other one-fifths is processed in Finland.
(4) What is less well known is that four-fifths of the cobalt sulphates and oxides used to make the all-important cathodes for lithium-ion batteries are refined in China.

32. (1) And finally, Tokyo Chutei Iki from Japan created a buzz beyond Asia with its restless ten-person baritone saxophone-only group.
(2) Then we have ADHD, a band from Iceland, which has found fans in faraway places by weaving rock influences into its compositions featuring saxophone, organ and guitar.
(3) While New York and New Orleans remain established centres for jazz, new voices can emerge from just about anywhere.
(4) Today's nonconformists and mavericks also incorporate elements of hip-hop, rock or classical music into their jazz works.
(5) Maurin Auxemery, a programmer for the Montreal festival, says that London has emerged as a hotbed for edgy jazz artists such as The Comet is Coming.

33. Many affecting photographs have been made during the huge waves of international migration of the past few years. These pictures issue, as usual, from the presumed rights of photographers to depict the suffering of people "out there" for the viewing of those "back home." But in looking at these images — images of war, of starvation, of capsized boats and exhausted caravans — we must go beyond the usual frames of pity and abjection. Every picture of suffering should elicit a question stronger than "Why is this happening?" The question should be "Why have I allowed this to happen?"

    (A) Photographs of war, starvation and wrecked caravans spread the message of suffering migrants to the rest of the world.
    (B) Individuals looking at photographs of the miseries of migrants should feel responsible for their plight.
    (C) Instead of pity, a good photograph brings out guilt as to why the individual has allowed the suffering to happen.
    (D) Photographers have the responsibility to depict the suffering of people, but those looking at the images also have a responsibility beyond hypocritical indignation.

DIRECTIONS *for question 34*: The sentences given in the question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

34. (1) Melting permafrost in Greenland and the Arctic tundra is releasing vast amounts of methane, a potent climate-altering gas.
    (2) But some see an Arctic with navigable seas in the summer and newly accessible fossil fuels as an irresistible opportunity.
    (3) A less icy Arctic is coming, and generally speaking, that's not a good thing.
    (4) Climate change is warming this region twice as fast as the global average, threatening wildlife and indigenous communities.

[ ]

SECTION –II
Number of Questions = 32

DIRECTIONS *for questions 1 to 4*: Answer the questions on the basis of the information given below.

Four persons, Amit, Kiran, Pranav and Gaurav, went to a market to buy some vegetables. Exactly one of them purchased potatoes, exactly two of them purchased cauliflowers, exactly three of them purchased tomatoes and all of them purchased onions.

The following is known about the number of vegetables that they purchased:
(i) The total number of potatoes that they purchased was the same as the number of tomatoes that Gaurav purchased.
(ii) The total number of cauliflowers that they purchased was the same as the total number of vegetables that Pranav purchased.
(iii) The number of onions that Gaurav purchased was the same as the number of tomatoes that Amit purchased.
(iv) The total number of tomatoes that they purchased was 15 more than the total number of cauliflowers that they purchased, which, in turn, was 25 more than the total number of onions that they purchased.
(v) Amit, Kiran and Gaurav purchased four cauliflowers, five tomatoes and six onions respectively (along with other vegetables that they may have purchased).

DIRECTIONS *for question 1*: Type in your answer in the input box provided below the question.

1. What is the minimum number of tomatoes that the four of them could have purchased?

[ ]

DIRECTIONS *for questions 2 and 3*: Select the correct alternative from the given choices.

2. What best can be said about the number of onions that Pranav purchased?
    (A) It is definitely greater than 6.
    (B) It is definitely lesser than 4.
    (C) It lies between 3 and 6.
    (D) It lies between 5 and 10.

3. It is known that one of the four persons purchased all the types of vegetables.

    Who purchased the highest total number of vegetables?
    (A) Amit   (B) Kiran
   (C) Gaurav   (D) Cannot be determined

DIRECTIONS *for question 4*: Type in your answer in the input box provided below the question.

4. It is known that one of the four persons purchased all the types of vegetables.

    What is the minimum possible number of vegetables that Amit could have purchased?

[ ]

DIRECTIONS *for questions 5 to 8:* Answer the questions on the basis of the information given below.

Six persons, Amit, Kishore, Lalit, Hari, Gaurav and Ranjit, went to the gym on different days of a particular week, from Monday to Sunday. On any day, no person went to the gym more than once. The following graph provides the number of persons that went to the gym on each day of the week:
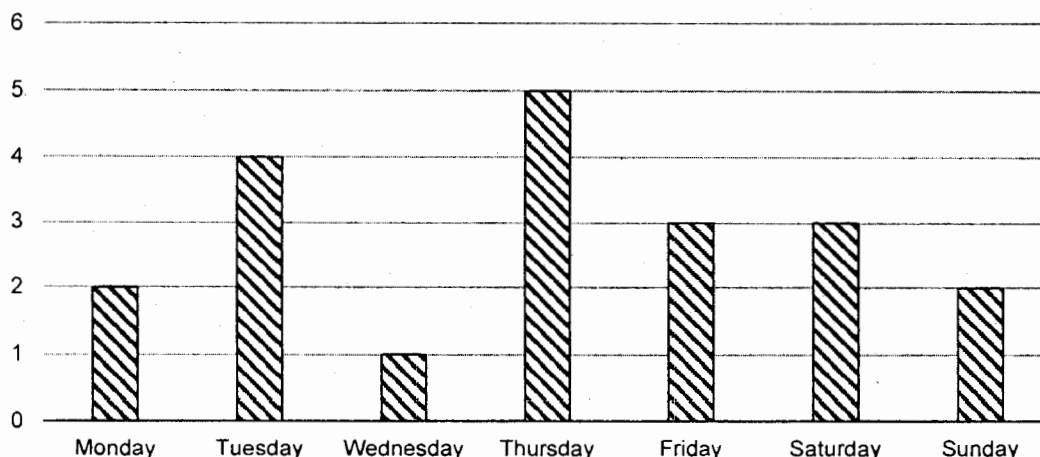
It is also known that

(i) no person went to the gym for more than four days.
(ii) each of Gaurav and Hari went to the gym only twice.
(iii) Ranjit went to the gym on neither Saturday nor Friday.
(iv) Kishore did not go to the gym on any two consecutive days.

DIRECTIONS *for questions 5 to 8:* Select the correct alternative from the given choices.

5. On which of the following days did Lalit not go to the gym?
   (A) Tuesday   (B) Sunday
   (C) Friday   (D) Saturday

6. What is the maximum number of consecutive days that any person went to the gym?
   (A) 2
   (B) 3
   (C) 4
   (D) No person went on any two consecutive days.

7. On how many days did both Kishore and Ranjit go the gym?
   (A) 0   (B) 1   (C) 2   (D) 3

8. Which of the following statements is sufficient to determine all the persons who went to the gym on Tuesday?
   (A) Hari and Ranjit went to the gym together on at most one day.
   (B) Lalit and Hari went to the gym together on exactly two days.
   (C) Kishore and Gaurav did not go the gym together on any day.
   (D) Gaurav and Ranjith went to the gym together on at least one day.

DIRECTIONS *for questions 9 to 12:* Answer the questions on the basis of the information given below.

Rahul visited each of five cities, Ahmadabad, Bangalore, Kolkata, Lucknow and Indore, exactly once, during a particular month. In each city, he spent a certain amount of money which is an integral multiple of ₹1000. The amounts of money that he spent in the first three cities that he visited, taken in that order, are in the ratio 1 : 3 : 4. The amounts of money that he spent in the four cities in which he spent the four highest amounts are in the ratio 20 : 12 : 9 : 4.

DIRECTIONS *for questions 9 and 10:* Select the correct alternative from the given choices.

9. If he spent ₹80,000 in the fourth city that he visited, what is the highest amount that he could have spent in any city?
   (A) ₹1,00,000   (B) ₹80,000
   (C) ₹8,00,000   (D) ₹4,00,000

10. If the least amount that he spent in any city is x, which of the following can best be said about the minimum possible value of x?
    (A) It lies between ₹4,000 and ₹6,000.
    (B) It is exactly ₹3,000.
    (C) It is less than ₹2,000.
    (D) It lies between ₹6,000 and ₹10,000.

DIRECTIONS *for question 11 and 12:* Type in your answer in the input box provided below the question.

11. Rahul visited Kolkata before he visited Ahmadabad, where he spent ₹24,000. Further, he spent ₹10,000 less in Indore than what he spent in Lucknow, and Indore was not the last city that he visited.

    How much did Rahul spend (in ₹) in the last city that he visited?

12. Rahul visited Kolkata before he visited Ahmadabad, where he spent ₹24,000. Further, he spent ₹10,000 less in Indore than what he spent in Lucknow, and Indore was not the last city that he visited.

What is the difference (in ₹) between the amounts that he spent in the third city that he visited and Lucknow?

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DIRECTIONS *for questions 13 to 16:* Answer the questions on the basis of the information given below.

The following table provides the GDP (G), GDP per capita (PG), i.e., the GDP divided by the total population, Number of literates (L) and the Literacy rate (LR), i.e., the number of literates as a percentage of the total population, for six different countries – Country A through Country F:

Country	G (in USD bn)	PG (in USD)	L (in mn)	LR
Country A	2.5			11%
Country B		300	4	
Country C	5		5	
Country D	7.5	250		
Country E			3	15%
Country F		500		25%

It is also known that

(i)   the GDP of each of the six countries is at least USD 1 bn.
(ii) the total number of literates in Country A and Country B combined is the same as the total number of illiterates in Country D and Country E combined.
(iii) the GDP per capita of Country C is USD 50 more than that of Country A.
(iv) the number of literates in Country A is 1 mn more than that in Country D.
(v) the Literacy Rate of Country B is not more than 20%.
(vi) the GDP of Country B and Country E combined is USD 2 bn more than that of Country C.
(vii) the GDP of Country F is twice the GDP of Country E.

DIRECTIONS *for questions 13 and 14:* Select the correct alternative from the given choices.

13. What is the GDP per capita of the country which has the highest Literacy Rate?
(A) USD 250   (B) USD 300
(C) USD 12.5   (D) USD 50

14. For how many countries is the GDP per capita at least twice that of Country E?
(A) 1   (B) 3   (C) 4   (D) 2

DIRECTIONS *for question 15 and 16:* Type in your answer in the input box provided below the question.

15. What is the GDP (in USD bn) of Country F?

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16. What is the total number of literates (in mn) across the six countries combined?

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DIRECTIONS *for questions 17 to 20:* Answer the questions on the basis of the information given below.

Six children, A through F, had a certain number of chocolates with them at the beginning of a certain day. During the day, each of the six children ate at least one chocolate from the ones that they had and, then, exchanged some chocolates between themselves. It is known that each child ate the same number of chocolates. Further, each child exchanged chocolates with (i.e., gave a certain number of chocolates to and took a certain number of chocolates from) exactly one child. The following table provides the number of chocolates with each child at the beginning of the day and at the end of the day:

Child	Number of Chocolates	
	Beginning of the day	End of the day
A	24	20
B	18	5
C	32	10
D	16	18
E	18	11
F	24	8

17. With which child did B exchange chocolates?
   (A) A
   (B) C
   (C) D
   (D) None of the above

18. What is the maximum increase in the number of chocolates with any child because of exchanging chocolates?
   (A) 12   (B) 9   (C) 15   (D) 6

19. What is the number of chocolates at the beginning of the day with the child with whom A exchanged chocolates?
   (A) 16   (B) 18
   (C) 32   (D) None of the above

20. On the next day, the children did not eat any chocolates but once again exchanged chocolates, in the same manner as the previous day, such that the difference between the number of chocolates with any two children is the minimum possible.

   What is the maximum possible difference between the chocolates with any two children?
   (A) 4   (B) 5   (C) 3   (D) 2

DIRECTIONS *for questions 21 to 24:* Answer the questions on the basis of the information given below.

Each of five persons, Jack, Gene, Kevin, Martin and Ronin, visited exactly two out of five different countries, Spain, Argentina, Brazil, Russia and Madagascar, in the years 2017 and 2018. In each year, each person visited a different country and no person visited the same country twice.

It is also known that

(i) during the two years, any person who visited Russia did not visit Spain.
(ii) the country that Kevin visited in 2018 is the same as the one that Martin visited in 2017.
(iii) the person who visited Madagascar in 2017 visited Argentina in 2018.
(iv) Ronin visited Spain in 2017, but did not visit Brazil in 2018.
(v) Kevin did not visit Madagascar in 2017 and Martin visited Spain in one of the years.

DIRECTIONS *for questions 21 to 24:* Select the correct alternative from the given choices.

21. Which country did Kevin visit in 2017?
   (A) Argentina   (B) Brazil
   (C) Russia   (D) Spain

22. Which of the following countries did Martin visit in any of 2017 or 2018?
   (A) Brazil   (B) Argentina
   (C) Madagascar   (D) Russia

23. Which of the following countries did Jack definitely visit in either 2017 or 2018?
   (A) Madagascar   (B) Argentina
   (C) Russia   (D) Spain

24. Which of the following is definitely false?
   (A) The person who visited Russia in 2018 visited Argentina in 2017.
   (B) The person who visited Brazil in 2017 visited Spain in 2018.
   (C) The person who visited Russia in 2017 visited Spain in 2018.
   (D) The person who visited Spain in 2017 visited Madagascar in 2018.

DIRECTIONS *for questions 25 to 28:* Answer the questions on the basis of the information given below.

During a year, a total of 100 tennis tournaments were conducted. Four players, Ankit, Phani, Kalyan and Tarun, participated in some of these tournaments. It is known that, among the four players, the number of players who participated in any tournament was 1 or 3 or 4 but neither 0 nor 2.

It is also known that

(i) the number of tournaments in which only Ankit participated is thrice the number of tournaments in which only Kalyan participated, which, in turn, is twice the number of tournaments in which only Tarun participated.
(ii) all the four players participated in 8 tournaments.
(iii) the number of tournaments in which both Phani and Kalyan participated is 22 more than that in which only Kalyan and Ankit participated in.
(iv) the number of tournaments in which Ankit and Phani participated is the same as that in which Tarun and Kalyan participated, which, in turn, is the same as that in which Tarun and Ankit participated.
(v) the number of tournaments in which only Phani participated is the same as that in which only Ankit, Kalyan and Tarun participated.

DIRECTIONS *for questions 25 to 28:* Select the correct alternative from the given choices.

25. What is the maximum number of tournaments in which only Kalyan participated?
   (A) 10   (B) 14   (C) 12   (D) 16

26. If the number of tournaments in which only Ankit participated is at least 30 more than that in which only Phani participated, in how many tournaments did Tarun participate?
   (A) 42   (B) 36
   (C) 32   (D) Cannot be determined

27. In each of the 100 tournaments, one of the four players was the winner of the tournament and Ankit was the winner of the tournament in exactly 38 tournaments.

   What is the minimum number of tournaments in which Kalyan would have been the winner?
   (A) 8   (B) 10   (C) 14   (D) 12

28. In each of the 100 tournaments, one of the four players was the winner of the tournament and Ankit was the winner of the tournament in exactly 38 tournaments.

   If Tarun was the winner in at least 20 tournaments, what is the maximum number of tournaments in which Phani would have been the winner?
   (A) 30   (B) 24   (C) 36   (D) 42

DIRECTIONS *for questions 29 to 32:* Answer the questions on the basis of the information given below.

In a class, six students, A through F, were sitting in six chairs from left to right, all facing the same direction, not necessarily in the same order. Karthik, the teacher of the class, handed over a certain number of blank sheets to the student at the extreme left. Karthik asked each student to take as many blank sheets as he wants and pass the remaining to the student to his immediate left. After the sixth student (i.e., the student sitting at the extreme right) took the sheets, Karthik collected the remaining sheets from him.

It is also known that

(i) the number of sheets that the first student took was twice the number of sheets that C took.
(ii) no two students took the same number of sheets and each student took at least one sheet.
(iii) B, who was not sitting at the extreme right, took two sheets more than the student who was sitting two places to his left.
(iv) D, who was sitting to the immediate left of B, took 15 sheets and the number of sheets that any other student took was either greater than 20 or less than 10.
(v) E, who was sitting two places to the right of the student sitting at the extreme left, took 6 sheets.
(vi) Karthik gave 60 sheets to the student sitting at the extreme left and collected 18 sheets from F.

DIRECTIONS *for question 29:* Type in your answer in the input box provided below the question.

29. How many sheets did C take?

DIRECTIONS *for question 30:* Select the correct alternative from the given choices.

30. Who was sitting to the immediate left of the person who took the lowest number of sheets?
(A) A   (B) E   (C) D   (D) C

DIRECTIONS *for question 31:* Type in your answer in the input box provided below the question.

31. What is the difference between the number of sheets that A and D took?

DIRECTIONS *for question 32:* Select the correct alternative from the given choices.

32. Which of the following statements is definitely true?
(A) The student sitting at the extreme right took the highest number of sheets.
(B) The student sitting at the extreme left took the highest number of sheets.
(C) The student sitting to the immediate right of B took the highest number of sheets.
(D) The student sitting to the immediate left of E took the lowest number of sheets.

SECTION –III
Number of Questions = 34

DIRECTIONS *for questions 1 and 2:* Type in your answer in the input box provided below the question.

1. If a and b are both natural numbers, and $\log_2 (a \log_3 b) = 1$, how many ordered pairs (a, b) exist?

2. If $36a^2 - \dfrac{1}{9a^2} = 4$, what is the value of $216a^3 - \dfrac{1}{27a^3}$.

DIRECTIONS *for questions 3 to 8:* Select the correct alternative from the given choices.

3. If $P(a^2, 2a)$ is a point on the line segment joining the points A(2, 0) and B(0, 4), what is the ratio of the distances AP and PB ?
(A) $\sqrt{2} : 1$ (B) $1 : 1$ (C) $2 : 1$ (D) $1 : \sqrt{3}$

4. A student was asked to first divide a number by 7, then add 6 to the result and write down the sum as the answer. He, however, first added 6 to the number and then divided the sum by 7, getting 25 as the result, which he wrote down as the answer. Which of the following should have been the correct answer?

(A) $\dfrac{211}{7}$ (B) $\dfrac{169}{7}$ (C) $\dfrac{127}{7}$ (D) $\dfrac{169}{6}$

5. If $x \neq 0$, what is the product of the roots of the equation $\dfrac{(4x^{4001} + 5x^{4000})}{(6x^{3999})} = 4$?

(A) 4
(B) −24
(C) 12
(D) −6

6. The ratio of the number of apples that each of Adam, Eve and Pikachu have is 3 : 4 : 7. If they had 126 apples in total, what is the difference between the number of apples that Adam and Eve have?
(A) 7   (B) 8
(C) 9   (D) 14

7. What is the largest three-digit number that leaves a remainder 2 when divided by 5 and leaves a remainder 4 when divided by 7?
(A) 987
(B) 977
(C) 967
(D) 997

8. If the sum of the units digits in P^Q and 5^P is Q, where P and Q are natural numbers, such that P < 4 and Q < 7, how many possible values exist for Q^P?
(A) 3   (B) 2
(C) 1   (D) 0

9. A speedboat is travelling in a river. The speed of the boat in still water is 25 kmph and the rate of flow of the river is 5 kmph. Moving with the stream, the boat travelled 150 km in a certain amount of time. What distance (in km) will the boat cover in the same amount of time, if it were going against the stream?

10. The lengths of two sides of a triangle are 8 cm and 9 cm respectively. If one of the angles of the triangle is 90°, which of the following can be the length (in cm) of the third side?
    (A) $\sqrt{145}$
    (B) $\sqrt{17}$
    (C) $\sqrt{168}$
    (D) More than one of the above

11. How many values of x satisfy the equation $\log_3 \sqrt{(x+2)} + \log_3 \sqrt{(x-2)} = \log_9 \sqrt{x^4 - 16}$?

12. How many tiles, each having a length and breadth of 6 cm and 4 cm respectively, are required to completely cover a rectangular region having a length and breadth of 72 cm and 50 cm respectively?
    (A) 120   (B) 150   (C) 180   (D) 240

13. Three filling pipes can fill a tank in 12, 18 and 24 minutes respectively. There is another drain pipe, connected to the tank, that can empty the tank at the rate of three gallons per minute. All the four pipes, working together, can fill the tank in six minutes. Find the capacity of the tank.

gallons

14. P1 and P2 are two sets of parallel lines, such that the number of lines in P2 is greater than that in P1. If they intersect at a total of 18 points, the total number of parallelograms formed by P1 and P2 cannot be
    (A) 36.
    (B) 45.
    (C) 54.
    (D) All the above

15. What the greatest possible rational number that divides the fractions $\frac{2}{5}, \frac{4}{15}$ and $\frac{8}{10}$?
    (A) $\frac{2}{5}$ (B) $\frac{4}{5}$ (C) $\frac{2}{15}$ (D) $\frac{1}{15}$

16. If $|x - 3|.(y^2 - 4x + 4) < 0$, which of the following is definitely true?
    (A) $-2 < x < 3$ (B) $y > 2$
    (C) $-2 < y < 1$ (D) $x > 1$

17. A target board is made up of three concentric circles, of radii 4 cm, 6 cm, and 9 cm respectively. The region inside the circle of radius 4 cm is painted entirely in red; the region between the circle of radius 4 cm and the circle of radius 6 cm is painted in green and the region in between the circle of radius 6 cm and the circle of radius 9 cm is painted in yellow. If an arrow that was fired randomly hit the target board, what is the probability that it hit the region that is yellow?
    (A) $\frac{20}{81}$ (B) $\frac{16}{81}$ (C) $\frac{4}{9}$ (D) $\frac{5}{9}$

18. The sum of the first 12 terms of a geometric progression is six times the sum of the next six terms. If the first term of the progression is 32, what is the seventh term of the progression?

19. Two vessels, A and B, contain spirit and water, mixed in the ratio 7 : 3 and 4 : 9 respectively. Find the ratio in which the contents of A and B should be mixed so as to obtain a new mixture, containing spirit and water in the ratio 5 : 8?
    (A) 12 : 49
    (B) 11 : 45
    (C) 10 : 41
    (D) 9 : 37

20. The total age of a few eight-year-old children and a few seven-year-old children is 70 years. If there is at least one eight-year-old and at least one seven-year-old, in how many ways can a team be selected from these children, such that the sum of the ages of the children in the team is 54?

21. N is a positive integer at most equal to 100. If $(N-1)!$ is not divisible by N, how many different values can N assume?
    (A) 25   (B) 26   (C) 30   (D) 22

22. The length, breadth and height of a room are in the ratio 2 : 3 : 4. If the length and breadth of the room are doubled, while the height is halved, what is the percentage change in the area of the four walls of the room?
(A) No change
(B) Decreases by 16.67%
(C) Increases by 30%
(D) Decreases by 33.33%

DIRECTIONS *for question 23:* Type in your answer in the input box provided below the question.

23. In Hitami theatre, the price of a ticket, which is paid for just before exiting the theatre, varies as $P = Ax + By + C$, where P is the price of the ticket, x is the number of hours spent inside the theatre and y is the number of popcorns purchased, with A, B and C being constants. Today, Ram spent three hours inside the theatre and purchased seven popcorns. He would have spent ₹300 less on the ticket had he either spent 2.5 hours less and bought three popcorns more OR spent 1.5 hours more and purchased five popcorns less.

What is the maximum number of hours that Ram could have spent inside the theatre with the amount that he spent?

DIRECTIONS *for question 24:* Select the correct alternative from the given choices.

24. PQRS is a quadrilateral whose diagonals are perpendicular to each other. If PQ =16 cm, QR = 12 cm and RS = 20 cm, find PS.
(A) $12\sqrt{2}$ cm.
(B) $8\sqrt{2}$ cm.
(C) $16\sqrt{2}$ cm.
(D) $24\sqrt{2}$ cm.

DIRECTIONS *for question 25:* Type in your answer in the input box provided below the question.

25. The average weight of A, B and C is 20 kg. If the average weight of B, C and D is 18 kg, and the weight of D is 14 kg, find the weight of A.

[   ] kg

DIRECTIONS *for questions 26 to 29:* Select the correct alternative from the given choices.

26. On a certain day, a fruit vendor sells 40 percent of the avocados she had and throws away 25 percent of the remainder. The next day, she sells 60 percent of the remaining avocados and throws away the rest. What percentage of the total avocados did she throw away?
(A) 12%
(B) 33%
(C) 16.67%
(D) 45%

27. In a cricket club, 75% of the players are batsmen and 12% of the players are neither batsmen nor bowlers. If 64% of the players are bowlers, what percentage of players are both batsmen and bowlers?
(A) 51%   (B) 24%   (C) 13%   (D) 27%

28. At how many points do the graphs $y = 4x^2 + 5$ and $y = 5x + 4$ intersect?
(A) 3   (B) 0
(C) 2   (D) None of the above

29. If $f(x) = f(x - 1) - f(x + 1)$, while f(1) = 3 and f(4) = 1, what is the value of f(7)?
(A) −1   (B) −2   (C) 0   (D) 2

DIRECTIONS *for questions 30 and 31:* Type in your answer in the input box provided below the question.

30. There are 13 persons – four Slytherins, three Ravenclaws, and six Gryffindors – in a magic club. A team of six people should be selected (from the above persons) for a competition such that there are exactly three Gryffindors in the team and at least one person each from among Ravenclaws and Slytherins. In how many ways can the team be selected?

31. Montex bought a book that had 144 pages, numbered from 1 to 144. He took a pen and circled all the 4's that appeared in the page numbers. How many circles did he draw in all?

DIRECTIONS *for question 32:* Select the correct alternative from the given choices.

32. Krish gave Santy a certain amount of money everyday, for not more than a week, such that the amount that he gave Santy was ₹2 more than what he gave her the previous day. At the end of each day, Santy counted the total amount that she had with her and when that amount became a perfect square, she bought a doll. If Krish gave her either ₹12 or ₹13 on the first day, what is the price (in ₹) of the doll?
(A) 64
(B) 121
(C) 100
(D) Cannot be determined

DIRECTIONS *for question 33:* Type in your answer in the input box provided below the question.

33. S is an arithmetic progression with 40 elements, such that the first two terms are 4 and 9 respectively. R is another arithmetic progression with 50 elements, such that the first two terms are 8 and 11 respectively. How many elements do R and S have in common?

DIRECTIONS *for question 34:* Select the correct alternative from the given choices.

34. How many integral values of x satisfy the equation $3^{\sqrt{x}} + 4^{\sqrt{x}} = 5^{\sqrt{x}}$?
(A) 0   (B) 1   (C) 2   (D) 3