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CAT 2018 Slot-2 Question Paper & Solution

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SLOT-2 VARC

Direction (Q1-5): The passage below is accompanied by a set of questions. Choose the best answer to each question.

"Everybody pretty much agrees that the relationship between elephants and people has dramatically changed," [says psychologist Gay] Bradshaw. "Where for centuries humans and elephants lived in relatively peaceful coexistence, there is now hostility and violence. Now, I use the term 'violence' because of the intentionality associated with it, both in the aggression of humans and, at times, the recently observed behavior of elephants.". . .

Typically, elephant researchers have cited, as a cause of aggression, the high levels of testosterone in newly matured male elephants or the competition for land and resources between elephants and humans. But. . . Bradshaw and several colleagues argue that today's elephant populations are suffering from a form of chronic stress, a kind of species-wide trauma. Decades of poaching and culling and habitat loss, they claim, have so disrupted the intricate web of familial and societal relations by which young elephants have traditionally been raised in the wild, and by which established elephant herds are governed, that what we are now witnessing is nothing less than a precipitous collapse of elephant culture.. . .

Elephants, when left to their own devices, are profoundly social creatures Young elephants are raised within an extended, multitiered network of doting female caregivers that includes the birth mother, grandmothers, aunts and friends. These relations are maintained over a life span as long as 70 years. Studies of established herds have shown that young elephants stay within 15 feet of their mothers for nearly all of their first eight years of life, after which young females are socialized into the matriarchal network, while young males go off for a time into an all-male social group before coming back into the fold as mature adults.. . .

This fabric of elephant society, Bradshaw and her colleagues [demonstrate], ha[s] effectively been frayed by years of habitat loss and poaching, along with systematic culling by government agencies to control elephant numbers and translocations of herds to different habitats. As a result of such social upheaval, calves are now being born to and raised by ever younger and inexperienced mothers. Young orphaned elephants, meanwhile, that have witnessed the death of a parent at the hands of poachers are coming of age in the absence of the support system that defines traditional elephant life. "The loss of elephant elders," [says] Bradshaw "and the traumatic experience of witnessing the massacres of their family, impairs normal brain and behavior development in young elephants."

What Bradshaw and her colleagues describe would seem to be an extreme form of anthropocentric conjecture if the evidence that they've compiled from various elephant researchers. . . weren't so compelling. The elephants of decimated herds, especially orphans who've watched the death of their parents and elders from poaching and culling, exhibit behavior typically associated with post-traumatic stress disorder and other trauma-related disorders in humans: abnormal startle response, unpredictable asocial behavior, inattentive mothering and hyper aggression.. . .

[According to Bradshaw], "Elephants are suffering and behaving in the same ways that we recognize in ourselves as a result of violence Except perhaps for a few specific

features, brain organization and early development of elephants and humans are extremely similar."

1. The passage makes all of the following claims EXCEPT:
A. elephant mothers are evolving newer ways of rearing their calves to adapt to emerging threats.
B. the elephant response to deeply disturbing experiences is similar to that of humans.
C. human actions such as poaching and culling have created stressful conditions for elephant communities.
D. elephants establish extended and enduring familial relationships as do humans.
Answer: A
Solution:
Refer to the second last paragraph: 'The elephants of decimated herds, especially orphans who've watched the death of their parents and elders from poaching and culling, exhibit behavior typically associated with post-traumatic stress disorder and other trauma-related disorders in humans: abnormal startle response, unpredictable asocial behavior, inattentive mothering and hyper aggression.. . .' Options B and C can be verified from this extract.
Option D can be verified from the following lines of the third paragraph: 'young elephants are raised within an extended, multi-tiered network of doting female caregivers that includes the birth mother, grandmothers, aunts and friends. These relations are maintained over a life span as long as 70 years'.
Option A cannot be verified from this paragraph. Nowhere has it been stated that elephant mothers are evolving newer ways of rearing their calves.
Hence, the correct answer is option A.
2. Which of the following statements best expresses the overall argument of this passage?
A. Recent elephant behaviour could be understood as a form of species-wide trauma-related response.
B. Elephants, like the humans they are in conflict with, are profoundly social creatures.
C. The relationship between elephants and humans has changed from one of coexistence to one of hostility.
D. The brain organisation and early development of elephants and humans are extremely similar.
Answer: A
Solution:
In short, the question is asking for the central idea of this passage.
The main idea of the passage is the changed elephant behavior and species-wide trauma which they have endured due to various human activities. Option A states this and is the correct answer.
Options B and D are a part of the overall argument but they are not the key ideas.
Option C is also not the main argument of the passage. The passage is not focused on the relationship between elephants and humans. The passage is more focused on shedding some light on the aggressive behavior of elephants and of exploring the causes behind the same.
Hence, the correct answer is option A.

3. Which of the following measures is Bradshaw most likely to support to address the problem of elephant aggression?
A. Funding of more studies to better understand the impact of testosterone on male elephant aggression.
B. The development of treatment programmes for elephants drawing on insights gained from treating post-traumatic stress disorder in humans.
C. Studying the impact of isolating elephant calves on their early brain development, behaviour and aggression.
D. Increased funding for research into the similarity of humans and other animals drawing on insights gained from human-elephant similarities.
Answer: B
Solution:
Refer to the relevant extract: 'The elephants of decimated herds, especially orphans who've watched the death of their parents and elders from poaching and culling, exhibit behavior typically associated with post-traumatic stress disorder and other trauma-related disorders in humans: abnormal startle response, unpredictable asocial behavior, inattentive mothering and hyper aggression.. . .' Since the behavior depicted by elephants is similar to the behavior depicted by humans, therefore, any treatment that works for humans should be recommended for elephants as well. Option B states this and is the correct answer.
Option A can be eliminated because it doesn't state how "studying the impact of testosterone" would help in addressing the problem of elephant aggression.
Options C and D don't address the problem of elephant aggression, which is the main idea of the passage.
Hence, the correct answer is option B.
4.In paragraph 4, the phrase, 'The fabric of elephant society. . . has(s) effectively been frayed by. . .' is:
A. an accurate description of the condition of elephant herds today.
B. a metaphor for the effect of human activity on elephant communities.
C. an exaggeration aimed at bolstering Bradshaw's claims.
D. an ode to the fragility of elephant society today.
Answer: B
Solution:
'The fabric' in 'The fabric has been frayed' is a metaphorical depiction of the 'effect of human activity on elephant societies of today'.
A metaphor is a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable.
Option B states this and is the correct answer.
Hence, the correct answer is option B.
5. In the first paragraph, Bradshaw uses the term 'violence' to describe the recent change in the human-elephant relationship because, according to him:
A. there is a purposefulness in human and elephant aggression towards each other.
B. elephant herds and their habitat have been systematically destroyed by humans.
C. human-elephant interactions have changed their character over time.
D. both humans and elephants have killed members of each other's species.
Answer: A
Solution:

Refer to the relevant extract: 'Now, I use the term 'violence' because of the intentionality associated with it, both in the aggression of humans and, at times, the recently observed behavior of elephants." The author uses the word "intentionality" to mean that there is a reason behind the mutual aggression between the two species. Option A covers this essence by mentioning the word "purposefulness'.
Option B is an extreme choice not borne out by the passage. 'Systematic Destruction' is far-fetched.
Option C doesn't delve into 'reasons' behind the violent human-elephant relationships.
Option D is incorrect because 'violence' is not to be equated with 'killing' members of each other's species.
Hence, the correct answer is option A.

Direction (Q6-10): The passage below is accompanied by a set of questions. Choose the best answer to each question.

The only thing worse than being lied to is not knowing you're being lied to. It's true that plastic pollution is a huge problem, of planetary proportions. And it's true we could all be doing more to reduce our plastic footprint. The lie is that blame for the plastic problem is wasteful consumers and that changing our individual habits will fix it.

Recycling plastic is to saving the Earth what hammering a nail is to halting a falling skyscraper. You struggle to find a place to do it and feel pleased when you succeed. But your effort is wholly inadequate and distracts from the real problem of why the building is collapsing in the first place. The real problem is that single-use plastic—the very idea of producing plastic items like grocery bags, which we use for an average of 12 minutes but can persist in the environment for half a millennium—is an incredibly reckless abuse of technology. Encouraging individuals to recycle more will never solve the problem of a massive production of single-use plastic that should have been avoided in the first place.

As an ecologist and evolutionary biologist, I have had a disturbing window into the accumulating literature on the hazards of plastic pollution. Scientists have long recognized that plastics biodegrade slowly, if at all, and pose multiple threats to wildlife through entanglement and consumption. More recent reports highlight dangers posed by absorption of toxic chemicals in the water and by plastic odors that mimic some species' natural food. Plastics also accumulate up the food chain, and studies now show that we are likely ingesting it ourselves in seafood.. . .

Beginning in the 1950s, big beverage companies like Coca-Cola and Anheuser-Busch, along with Phillip Morris and others, formed a non-profit called Keep America Beautiful. Its mission is/was to educate and encourage environmental stewardship in the public. At face value, these efforts seem benevolent, but they obscure the real problem, which is the role that corporate polluters play in the plastic problem. This clever misdirection has led journalist and author Heather Rogers to describe Keep America Beautiful as the first corporate greenwashing front, as it has helped shift the public focus to consumer recycling behavior and actively thwarted legislation that would increase extended producer responsibility for waste management.. . .

The greatest success of Keep America Beautiful has been to shift the onus of environmental responsibility onto the public while simultaneously becoming a trusted name in the environmental movement.. . .

So what can we do to make responsible use of plastic a reality? First: reject the lie. Litterbugs are not responsible for the global ecological disaster of plastic. Humans can only function to the best of their abilities, given time, mental bandwidth and systemic constraints. Our huge problem with plastic is the result of a permissive legal framework that has allowed the uncontrolled rise of plastic pollution, despite clear evidence of the harm it causes to local communities and the world's oceans. Recycling is also too hard in most parts of the U.S. and lacks the proper incentives to make it work well.

6. In the second paragraph, the phrase 'what hammering a nail is to halting a falling skyscraper' means:
A. relying on emerging technologies to mitigate the ill-effects of plastic pollution.
B. encouraging the responsible production of plastics by firms.
C. focusing on consumer behaviour to tackle the problem of plastics pollution.
D. focusing on single-use plastic bags to reduce the plastics footprint.
Answer: C
Solution:
Refer to the relevant extract: 'The lie is that blame for the plastic problem is wasteful consumers and that changing our individual habits will fix it.' and the first sentence of the second paragraph which states, 'Recycling plastic is to saving the Earth what hammering a nail is to halting a falling skyscraper'. These extracts clearly imply that changing consumer behavior towards plastic won't solve the problem of plastic pollution. Thus, option C is the correct answer.
Options A, B and D can be eliminated.
Hence, the correct answer is option C.
7.In the first paragraph, the author uses "lie" to refer to the:
A. blame assigned to consumers for indiscriminate use of plastics.
B. understatement of the enormity of the plastics pollution problem.
C. understatement of the effects of recycling plastics.
D. fact that people do not know they have been lied to.
Answer: A
Solution:
Refer to the relevant extract: 'The lie is that blame for the plastic problem is wasteful consumers and that changing our individual habits will fix it'. The 'lie' refers to 'blame assigned to consumers for indiscriminate use of plastics'. Thus, option A is the correct answer.
Options B, C and D are thus eliminated.
Hence, the correct answer is option A.
8. The author lists all of the following as negative effects of the use of plastics EXCEPT the:
A. slow pace of degradation or non-degradation of plastics in the environment.
B. air pollution caused during the process of recycling plastics.
C. adverse impacts on the digestive systems of animals exposed to plastic.
D. poisonous chemicals released into the water and food we consume.
Answer: B
Solution:
Options A, C and D are mentioned in the third paragraph.

Option B, which states, 'Air Pollution' caused during the process of recycling plastics has not been stated in the passage.
Hence, the correct answer is option B.
9. Which of the following interventions would the author most strongly support?
A. Completely banning all single-use plastic bags.
B. Having all consumers change their plastic consumption habits.
C. Recycling all plastic debris in the seabed.
D. Passing regulations targeted at producers that generate plastic products.
Answer: D
Solution:
Refer to the relevant extracts: 'This clever misdirection has led journalist and author Heather Rogers to describe Keep America Beautiful as the first corporate greenwashing front, as it has helped shift the public focus to consumer recycling behavior and actively thwarted legislation that would increase extended producer responsibility for waste management.. . .'. and 'Our huge problem with plastic is the result of a permissive legal framework that has allowed the uncontrolled rise of plastic pollution, despite clear evidence of the harm it causes to local communities and the world's oceans.' This implies that legislations should be passed to target the producers and not the consumers. Thus, Option D is the correct answer.
Option A is correct in that the author would likely support single use plastic but that can only be done from the producer point of view and not that of the consumer. Eliminate option A.
Option B is not possible according to the passage.
Recycling does not work, according to the author. Eliminate option C.
Hence, the correct answer is option D.
10. It can be inferred that the author considers the Keep America Beautiful organisation:
A. an innovative example of a collaborative corporate social responsibility initiative.
B. a sham as it diverted attention away from the role of corporates in plastics pollution.
C. an important step in sensitising producers to the need to tackle plastics pollution.
D. a "greenwash" because it was a benevolent attempt to improve public recycling habits.
Answer: B
Solution:
Refer to the relevant extract: 'This clever misdirection has led journalist and author Heather Rogers to describe Keep America Beautiful as the first corporate greenwashing front, as it has helped shift the public focus to consumer recycling behavior and actively thwarted legislation….' Thus, from this extract we can infer that the author believes that the Keep America Beautiful diverted people's attention away from the role of the corporates in plastic pollution. Thus, option B is the correct answer.
Option A contradicts the author's view.
Option C has not been mentioned in the passage.
Option D uses the term 'greenwash' incorrectly. The initiative was a grenwash because it helped '...shift the public focus to consumer recycling behavior and actively thwarted legislation….'
Hence, the correct answer is option B.

Direction (Q11-15): The passage below is accompanied by a set of questions. Choose the best answer to each question.

Economists have spent most of the 20th century ignoring psychology, positive or otherwise. But today there is a great deal of emphasis on how happiness can shape global economies, or — on a smaller scale — successful business practice. This is driven, in part, by a trend in "measuring" positive emotions, mostly so they can be optimized. Neuroscientists, for example, claim to be able to locate specific emotions, such as happiness or disappointment, in particular areas of the brain. Wearable technologies, such as Spire, offer data-driven advice on how to reduce stress.

We are no longer just dealing with "happiness" in a philosophical or romantic sense — it has become something that can be monitored and measured, including by our behavior, use of social media and bodily indicators such as pulse rate and facial expressions.

There is nothing automatically sinister about this trend. But it is disquieting that the businesses and experts driving the quantification of happiness claim to have our best interests at heart, often concealing their own agendas in the process. In the workplace, happy workers are viewed as a "win-win." Work becomes more pleasant, and employees, more productive. But this is now being pursued through the use of performance-evaluating wearable technology, such as Humanyze or Virgin Pulse, both of which monitor physical signs of stress and activity toward the goal of increasing productivity.

Cities such as Dubai, which has pledged to become the "happiest city in the world," dream up ever-more elaborate and intrusive ways of collecting data on well-being — to the point where there is now talk of using CCTV cameras to monitor facial expressions in public spaces. New ways of detecting emotions are hitting the market all the time: One company, Beyond Verbal, aims to calculate moods conveyed in a phone conversation, potentially without the knowledge of at least one of the participants. And Facebook [has] demonstrated. . . that it could influence our emotions through tweaking our news feeds — opening the door to ever-more targeted manipulation in advertising and influence.

As the science grows more sophisticated and technologies become more intimate with our thoughts and bodies, a clear trend is emerging. Where happiness indicators were once used as a basis to reform society, challenging the obsession with money that G.D.P. measurement entrenches, they are increasingly used as a basis to transform or discipline individuals.

Happiness becomes a personal project, that each of us must now work on, like going to the gym. Since the 1970s, depression has come to be viewed as a cognitive or neurological defect in the individual, and never a consequence of circumstances. All of this simply escalates the sense of responsibility each of us feels for our own feelings, and with it, the sense of failure when things go badly. A society that deliberately removed certain sources of misery, such as precarious and exploitative employment, may well be a happier one. But we won't get there by making this single, often fleeting emotion, the overarching goal.

11. In the author’s opinion, the shift in thinking in the 1970s:

A. introduced greater stress into people’s lives as they were expected to be responsible for their own happiness.

B. was a welcome change from the earlier view that depression could be cured by changing circumstances.
C. put people in touch with their own feelings rather than depending on psychologists.
D. reflected the emergence of neuroscience as the authority on human emotions.
Answer: A
Solution:
Refer to the relevant extract: 'Since the 1970s, depression has come to be viewed as a cognitive or neurological defect in the individual, and never a consequence of circumstances. All of this simply escalates the sense of responsibility each of us feels for our own feelings, and with it, the sense of failure when things go badly.' Thus, option A is the correct answer as it makes the point that before the 1970s, people thought that depression was a result of their circumstances but post 1970s, people became more responsible towards their feelings as they now believed that Depression was a neurological defect.
Option B is incorrect as nothing related to curing depression has been mentioned in the passage.
Option C refers to 'psychologists' which are nowhere mentioned in these lines.
Option D is completely baseless and cannot be determined from the passage.
Hence, the correct answer is option A.
12. The author's view would be undermined by which of the following research findings?
A. There is a definitive move towards the adoption of wearable technology that taps into emotions.
B. A proliferation of gyms that are collecting data on customer well-being.
C. Individuals worldwide are utilising technologies to monitor and increase their well-being.
D. Stakeholders globally are moving away from collecting data on the well-being of individuals.
Answer: D
Solution:
The author's views can be found in the following lines: 'Cities such as Dubai, which has pledged to become the "happiest city in the world," dream up ever-more elaborate and intrusive ways of collecting data on well-being — to the point where there is now talk of using CCTV cameras to monitor facial expressions in public spaces'. Option D negates this fact that stakeholders are moving towards collecting more data on the well-being of individuals. Therefore, it undermines the author's argument.
The above extract eliminates options A, B and C.
Hence, the correct answer is option D.
13.According to the author, Dubai:
A. develops sophisticated technologies to monitor its inhabitants' states of mind.
B. incentivises companies that prioritise worker welfare.
C. collaborates with Facebook to selectively influence its inhabitants' moods.
D. is on its way to becoming one of the world's happiest cities.
Answer: A
Solution:
Refer to the relevant extract, 'Cities such as Dubai, which has pledged to become the "happiest city in the world," dream up ever-more elaborate and intrusive ways of

collecting data on well-being — to the point where there is now talk of using CCTV cameras to monitor facial expressions in public spaces…' Clearly, Option A is the correct choice.
Options B and C are not mentioned in the passage.
Option D makes a false claim. Dubai is not yet on its way to becoming the happiest city. Rather it wants to be one.
Hence, the correct answer is option A.
14. According to the author, wearable technologies and social media are contributing most to:
A. happiness as a "personal project".
B. disciplining individuals to be happy.
C. depression as a thing of the past.
D. making individuals aware of stress in their lives.
Answer: B
Solution:
From the first paragraph which states that 'wearable devices are helping us to reduce stress', it can be easily inferred that what the author means is that these devices are disciplining individuals to be happy. Thus, option B is the correct answer.
Option A cannot be determined from the passage.
Option C is distorting the idea in the passage.
Option D doesn't cover the whole point made by the author.
Hence, the correct answer is option B.
15. From the passage we can infer that the author would like economists to:
A. correlate measurements of happiness with economic indicators.
B. measure the effectiveness of Facebook and social media advertising.
C. incorporate psychological findings into their research cautiously.
D. work closely with neuroscientists to understand human behaviour.
Answer: C
Solution:
Refer to the relevant extract, 'Economists have spent most of the 20th century ignoring psychology, positive or otherwise.' Clearly, the author wants economists to 'incorporate psychological findings into their research cautiously.' Thus, option C is the correct answer.
Options A, B and D have not been mentioned in the passage with regard to economists. They can thus be eliminated.
Hence, the correct answer is option C.
Direction (Q16-19): The passage below is accompanied by a set of questions. Choose the best answer to each question.
When researchers at Emory University in Atlanta trained mice to fear the smell of almonds (by pairing it with electric shocks), they found, to their consternation, that both the children and grandchildren of these mice were spontaneously afraid of the same smell. That is not supposed to happen. Generations of schoolchildren have been taught that the inheritance of acquire characteristics is impossible. A mouse should not be born with something its parents have learned during their lifetimes, any more than a mouse that loses its tail in an accident should give birth to tailless mice.. . .
Modern evolutionary biology dates back to a synthesis that emerged around the 1940s-60s, which married Charles Darwin's mechanism of natural selection with Gregor Mendel's discoveries of how genes are inherited. The traditional, and still

dominant, view is that adaptations – from the human brain to the peacock's tail – are fully and satisfactorily explained by natural selection (and subsequent inheritance). Yet [new evidence] from genomics, epigenetics and developmental biology [indicates] that evolution is more complex than we once assumed.. . .
In his book On Human Nature (1978), the evolutionary biologist Edward O Wilson claimed that human culture is held on a genetic leash. The metaphor [needs revision] Imagine a dog-walker (the genes) struggling to retain control of a brawny mastiff (human culture). The pair's trajectory (the pathway of evolution) reflects the outcome of the struggle. Now imagine the same dog-walker struggling with multiple dogs, on leashes of varied lengths, with each dog tugging in different directions. All these tugs represent the influence of developmental factors, including epigenetics, antibodies and hormones passed on by parents, as well as the ecological legacies and culture they bequeath.. . .
The received wisdom is that parental experiences can't affect the characters of their offspring. Except they do. The way that genes are expressed to produce an organism's phenotype – the actual characteristics it ends up with – is affected by chemicals that attach to them. Everything from diet to air pollution to parental behaviour can influence the addition or removal of these chemical marks, which switches genes on or off. Usually these so-called 'epigenetic' attachments are removed during the production of sperm and eggs cells, but it turns out that some escape the resetting process and are passed on to the next generation, along with the genes. This is known as 'epigenetic inheritance', and more and more studies are confirming that it really happens. Let's return to the almond-fearing mice. The inheritance of an epigenetic mark transmitted in the sperm is what led the mice's offspring to acquire an inherited fear.. . .
Epigenetics is only part of the story. Through culture and society, [humans and other animals] inherit knowledge and skills acquired by [their] parents.. . . All this complexity points to an evolutionary process in which genomes (over hundreds to thousands of generations), epigenetic modifications and inherited cultural factors (over several, perhaps tens or hundreds of generations), and parental effects (over single-generation timespans) collectively inform how organisms adapt. These extra-genetic kinds of inheritance give organisms the flexibility to make rapid adjustments to environmental challenges, dragging genetic change in their wake – much like a rowdy pack of dogs.

16. The Emory University experiment with mice points to the inheritance of:
A. psychological markers.
B. acquired characteristics.
C. personality traits.
D. acquired parental fears.
Answer: B
Solution:
Refer to the relevant extract, 'a mouse should not be born with something that its parents have learned during their lifetime'. 'Learned during lifetime' implies 'acquired traits'. Thus, option B is the correct answer.
Option A is out of the scope of the passage.
Option C doesn't mention 'acquired' with the personality traits. It can be eliminated.
Option D is a narrow answer choice as it talks only about 'fear'.

Hence, the correct answer is option B.
17. Which of the following best describes the author's argument?
A. Darwin's and Mendel's theories together best explain evolution.
B. Mendel's theory of inheritance is unfairly underestimated in explaining evolution.
C. Wilson's theory of evolution is scientifically superior to either Darwin's or Mendel's.
D. Darwin's theory of natural selection cannot fully explain evolution.
Answer: A
Solution:
Refer to the following extract, '...which married Charles Darwin's mechanism of natural selection with Gregor Mendel's discoveries of how genes are inherited. The traditional, and still dominant, view is that adaptations – from the human brain to the peacock's tail – are fully and satisfactorily explained by natural selection (and subsequent inheritance). Yet [new evidence] from genomics, epigenetics and developmental biology [indicates] that evolution is more complex than we once assumed. .' Going by this extract, option A becomes the correct answer.
Options B and Option D are not mentioned in the passage.
Option C cannot be determined or inferred from the passage.
Hence, the correct answer is option A.
18. Which of the following, if found to be true, would negate the main message of the passage?
A. A study affirming the influence of socio-cultural markers on evolutionary processes.
B. A study highlighting the criticality of epigenetic inheritance to evolution.
C. A study indicating the primacy of ecological impact on human adaptation.
D. A study affirming the sole influence of natural selection and inheritance on evolution.
Answer: D
Solution:
The central idea of the passage is that evolution can be understood as a function of natural selection and inheritance. Any option that weakens this idea will be the correct answer. Going by this logic, option D is the correct answer.
Options A and B will strengthen the main message while option C has not been mentioned in the passage.
Hence, the correct answer is option D.
19. The passage uses the metaphor of a dog walker to argue that evolutionary adaptation is most comprehensively understood as being determined by:
A. extra genetic, genetic, epigenetic and genomic legacies.
B. socio-cultural, genetic, epigenetic, and genomic legacies
C. ecological, hormonal, extra genetic and genetic legacies.
D. genetic, epigenetic, developmental factors, and ecological legacies.
Answer: D
Solution:
Refer to the following extract: 'All these tugs represent the influence of developmental factors, including epigenetics, antibodies and hormones passed on by parents, as well as the ecological legacies and culture they bequeath.' Going by this, we can see that only option D has these terms and no other extraneous terms.
Option A has a new term, extra-genetic.
Option B has a new term, socio-cultural.

Option C has genetic legacies instead of ecological legacies.
Hence, the correct answer is option D.

Direction (Q20-24): The passage given below is followed by a set of five questions. Choose the best answer to each question.

[The] Indian government [has] announced an international competition to design a National War Memorial in New Delhi, to honour all of the Indian soldiers who served in the various wars and counter-insurgency campaigns from 1947 onwards. The terms of the competition also specified that the new structure would be built adjacent to the India Gate – a memorial to the Indian soldiers who died in the First World War. Between the old imperialist memorial and the proposed nationalist one, India's contribution to the Second World War is airbrushed out of existence.

The Indian government's conception of the war memorial was not merely absent-minded.

Rather, it accurately reflected the fact that both academic history and popular memory have yet to come to terms with India's Second World War, which continues to be seen as little more than mood music in the drama of India's advance towards independence and partition in 1947

Further, the political trajectory of the postwar subcontinent has militated against popular remembrance of the war. With partition and the onset of the India-Pakistan rivalry, both of the new nations needed fresh stories for self-legitimisation rather than focusing on shared wartime experiences.

However, the Second World War played a crucial role in both the independence and partition of India. The Indian army recruited, trained and deployed some 2.5 million men, almost 90,000 of which were killed and many more injured. Even at the time, it was recognised as the largest volunteer force in the war.. . .

India's material and financial contribution to the war was equally significant. India emerged as a major military-industrial and logistical base for Allied operations in south-east Asia and the Middle East. This led the United States to take considerable interest in the country's future, and ensured that this was no longer the preserve of the British government.

Other wartime developments pointed in the direction of India's independence. In a stunning reversal of its long-standing financial relationship with Britain, India finished the war as one of the largest creditors to the imperial power.

Such extraordinary mobilization for war was achieved at great human cost, with the Bengal famine the most extreme manifestation of widespread wartime deprivation. The costs on India's home front must be counted in millions of lives.

Indians signed up to serve on the war and home fronts for a variety of reasons [M]any were convinced that their contribution would open the doors to India's freedom The political and social churn triggered by the war was evident in the massive waves of popular protest and unrest that washed over rural and urban India in the aftermath of the conflict. This turmoil was crucial in persuading the Attlee government to rid itself of the incubus of ruling India.. . .

Seventy years on, it is time that India engaged with the complex legacies of the Second World War. Bringing the war into the ambit of the new national memorial would be a fitting – if not overdue – recognition that this was India's War.

20. In the first paragraph, the author laments the fact that:
A. there is no recognition of the Indian soldiers who served in the Second World War.

B. the new war memorial will be built right next to India Gate.
C. India lost thousands of human lives during the Second World War.
D. funds will be wasted on another war memorial when we already have the India Gate memorial.
Answer: A
Solution:
Refer to the following extract: 'Between the old imperialist memorial and the proposed nationalist one, India's contribution to the Second World War is airbrushed out of existence.' Clearly, the phrase 'airbrushed out of existence' means 'to go completely unnoticed'. Thus, A is the correct answer.
Options B, C and D can be eliminated from the information given in the above extract.
Hence, the correct answer is option A.
21.The phrase 'mood music' is used in the second paragraph to indicate that the Second World War is viewed as:
A. setting the stage for the emergence of the India–Pakistan rivalry in the subcontinent.
B. a tragic period in terms of loss of lives and national wealth.
C. a backdrop to the subsequent independence and partition of the region.
D. a part of the narrative on the ill-effects of colonial rule on India.
Answer: C
Solution:
Refer to the following extract: 'Rather, it accurately reflected the fact that both academic history and popular memory have yet to come to terms with India's Second World War, which continues to be seen as little more than mood music in the drama of India's advance towards independence and partition in 1947". Mood-Music therefore refers to the light music being played in the background without having any significant impact on the overall scenario of events. So, mood music here refers to "a backdrop to the subsequent independence and partition of the region.' Thus, option C is the correct answer.
Options A, B and D do not conform to the above extract with regard to mood music and can thus be eliminated.
Hence, the correct answer is option C.
22. The author lists all of the following as outcomes of the Second World War EXCEPT:
A. independence of the subcontinent and its partition into two countries.
B. US recognition of India's strategic location and role in the War.
C. large-scale deaths in Bengal as a result of deprivation and famine.
D. the large financial debt India owed to Britain after the War.
Answer: D
Solution:
Option A can be verified from the very first paragraph.
Option B can be verified from the fourth paragraph.
Option C can be verified from the eighth paragraph.
Option D is stating the exact opposite of what is given in the passage. The passage states that it was Britain that owed huge sums of money to India and not the other way round.
Hence, the correct answer is option D.
23. The author claims that omitting mention of Indians who served in the Second World War from the new National War Memorial is:

A. a reflection of the academic and popular view of India's role in the War.
B. appropriate as their names can always be included in the India Gate memorial.
C. a reflection of misplaced priorities of the post-independence Indian governments.
D. is something which can be rectified in future by constructing a separate memorial.
Answer: A
Solution:
Refer to the following extract: 'Rather, it accurately reflected the fact that both academic history and popular memory have yet to come to terms with India's Second World War'. Thus, option A is the correct answer.
Options B and D are not stated in the passage.
Option C talks only about 'governments' and fails to make a mention of other parties that were involved.
Hence, the correct answer is option A.
24. The author suggests that a major reason why India has not so far acknowledged its role in the Second World War is that it:
A. blames the War for leading to the momentous partition of the country.
B. wants to forget the human and financial toll of the War on the country.
C. has been focused on building an independent, non-colonial political identity.
D. views the War as a predominantly Allied effort, with India playing only a supporting role.
Answer: C
Solution:
Refer to the following extract: 'With partition and the onset of the India-Pakistan rivalry, both of the new nations needed fresh stories for self-legitimization rather than focusing on shared wartime experiences.' 'Self-legitimization' here means building a legitimate and independent identity. Thus, option C is the correct answer.
Options A, B and D fail to highlight this point and can therefore be eliminated.
Hence, the correct answer is option C.
25. **Direction:** The four sentences (labelled 1,2,3,4) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper sequence of order of the sentences and key in this sequence of four numbers as your answer.

1) Impartiality and objectivity are fiendishly difficult concepts that can cause all sorts of injustices even if transparently implemented.
2) It encourages us into bubbles of people we know and like, while blinding us to different perspectives, but the deeper problem of 'transparency' lies in the words '…and much more'.
3) Twitter's website says that 'tweets you are likely to care about most will show up first in your timeline…based on accounts you interact with most, tweets you engage with, and much more.'
4) We are only told some of the basic principles, and we can't see the algorithm itself, making it hard for citizens to analyse the system sensibly or fairly or be convinced of its impartiality and objectivity.
Answer:1324
Solution:
Sentence 1 introduces the topic on which this entire paragraph is based,i.e., 'impartiality and objectivity'.

3 is an example of 1 and can be placed directly after 3.
The practice in 3 is further elaborated in 2 which starts with It - meaning Twitter.
4 sums up the entire argument for us by stating that it is hard for people to analyse the system sensibly or fairly or be convinced of its impartiality and objectivity.
Hence, the correct sequence is 1324.

26. **Direction:** Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.
1) Translators are like bumblebees.
2) Though long since scientifically disproved, this factoid is still routinely trotted out.
3) Similar pronouncements about the impossibility of translation have dogged practitioners since Leonardo Bruni's De interpretatione recta, published in 1424
4) Bees, unaware of these deliberations, have continued to flit from flower to flower, and translators continue to translate.
5) In 1934, the French entomologist August Magnan pronounced the flight of the bumblebee to be aerodynamically impossible.
Answer: 2
Solution:
Sentence 1 is a very good opening sentence as it introduces the topic of discussion; similarities between translators and bumblebees.
5 elaborates on the flight of bumblebees and can be placed directly after 1.
Sentence 3, which talks about similar statements about translators, should be placed directly after 5.
Sentence 4, sums up the whole argument and can be placed at the end.
Sentence 2 is the odd one out. The information that this factoid is being routinely trotted out despite being disapproved doesn't fit in this paragraph logically.
Hence, the correct answer is sentence 2.

27. **Direction:** The four sentences (labelled 1, 2, 3, and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of four numbers as your answer.
1) The woodland's canopy receives most of the sunlight that falls on the trees.
2) Swifts do not confine themselves to woodlands, but hunt wherever there are insects in the air.
3) With their streamlined bodies, swifts are agile flyers, ideally adapted to twisting and turning through the air as they chase flying insects – the creatures that form their staple diet.
4) Hundreds of thousands of insects fly in the sunshine up above the canopy, some falling prey to swifts and swallows.
Answer: 1432
Solution:
Sentences 1 and 4 form a pair. 'The Canopy' in 4 refers to the woodland's canopy in 1.
3-2 form a pair. 3 elaborates on the swifts and swallows and 2 provides additional information about swifts.
2 states, 'Swifts do not confine themselves to woodlands…' Therefore, the 3-2 pair will come after the 1-4 which has introduced woodlands.
Hence, the correct answer is 1432.

28. **Direction:** The passage given below is followed by four summaries. Choose the option that best captures the author's position.
Production and legitimation of scientific knowledge can be approached from a number of perspectives. To study knowledge production from the sociology of professions perspective would mean a focus on the institutionalization of a body of knowledge. The professions- approach informed earlier research on managerial occupation, business schools and management knowledge. It however tends to reify institutional power structures in its understanding of the links between knowledge and authority. Knowledge production is restricted in the perspective to the selected members of the professional community, most notably to the university faculties and professional colleges. Power is understood as a negative mechanism, which prevents the non-professional actors from offering their ideas and information as legitimate knowledge.
A. Professions-approach aims at the institutionalization of knowledge but restricts knowledge production as a function of a select few.
B. The study of knowledge production can be done through many perspectives.
C. Professions-approach focuses on the creation of institutions of higher education and disciplines to promote knowledge production
D. The professions-approach has been one of the most relied upon perspective in the study of management knowledge production.
Answer: A
Solution:
Option B sums up only the first part of the paragraph.
Option D with 'most relied upon perspective' is incorrect. Nowhere has it been stated that it is one of the most reliable perspectives.
Between options A and C, A is a better choice because it mentions the limitation of professions-approach as well, thereby covering the whole essence of the paragraph.
Hence, the correct answer is option A.
29. **Direction:** The passage given below is followed by four summaries. Choose the option that best captures the author's position.
Artificial embryo twinning is a relatively low-tech way to make clones. As the name suggests, this technique mimics the natural process that creates identical twins. In nature, twins form very early in development when the embryo splits in two. Twinning happens in the first days after egg and sperm join, while the embryo is made of just a small number of unspecialized cells. Each half of the embryo continues dividing on its own, ultimately developing into separate, complete individuals. Since they developed from the same fertilized egg, the resulting individuals are genetically identical.
A. Artificial embryo twinning is low-tech and mimetic of the natural development of genetically identical twins from the embryo after fertilization.
B. Artificial embryo twinning is low-tech unlike the natural development of identical twins from the embryo after fertilization.
C. Artificial embryo twinning is just like the natural development of twins, where during fertilization twins are formed.
D. Artificial embryo twinning is low-tech and is close to the natural development of twins where the embryo splits into two identical twins.
Answer: A
Solution:

Option A captures the key ideas of the paragraph accurately. Artificial embryo twinning is low-tech and mimics the natural development of genetically identical twins from the embryo after fertilization.
Option B describes the process of Artificial embryo twinning and then states it is not artificial embryo twinning.
Option C, too, distorts the facts stated in the passage. Twins are not formed during fertilization. Option D mentions that the embryo splits into two identical twins which is incorrect.
Hence, the correct answer is option A.
30. **Direction:** The passage given below is followed by four summaries. Choose the option that best captures the author's position.
The conceptualization of landscape as a geometric object first occurred in Europe and is historically related to the European conceptualization of the organism, particularly the human body, as a geometric object with parts having a rational, three-dimensional organization and integration. The European idea of landscape appeared before the science of landscape emerged, and it is no coincidence that Renaissance artists such as Leonardo da Vinci, who studied the structure of the human body, also facilitated an understanding of the structure of landscape.
Landscape, which had been a subordinate background to religious or historical narratives, became an independent genre or subject of art by the end of the sixteenth century or the beginning of the seventeenth century.
A. Landscape became a major subject of art at the turn of the sixteenth century.
B. The three-dimensional understanding of the organism in Europe led to a similar approach towards the understanding of landscape.
C. The study of landscape as an independent genre was aided by the Renaissance artists.
D. The Renaissance artists were responsible for the study of landscape as a subject of art.
Answer: C
Solution:
Option A goes out of context because the paragraph states that landscape became an independent genre of art or form, while the option says it became a major subject of art.
Option B distorts the facts; it mentions that 'the three-dimensional understanding of the organism in Europe led to...landscape', while the passage says that the two are related.
Option C best captures the author's position, which in the passage is clearly visible as 'Renaissance artists also facilitated an understanding of the structure of landscape'.
Option D is incorrect because it distorts the fact by saying the Renaissance artists were responsible, while the passage says that they only facilitated it.
Hence, the correct answer is option C.
31. **Direction:** The four sentences (labelled 1,2,3,4) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper sequence of order of the sentences and key in this sequence of four numbers as your answer:
1) But now we have another group: the unwitting enablers.

2) Democracy and high levels of inequality of the kind that have come to characterize the United States are simply incompatible.
3) Believing these people are working for a better world, they are, actually, at most, chipping away at the margins, making slight course corrections, ensuring the system goes on as it is, uninterrupted.
4) Very rich people will always use money to maintain their political and economic power.
Answer: 2413
Solution:
Sentence 2 opens the discussion by introducing the topic of inequality and 4 gives reasons for this inequality. Therefore, 2-4 form a pair.
1 introduces a new category of people - the unwitting enablers and 3 describes their actions. Thus, 1-3 form a pair.
Hence, the correct answer is 2413.
32. **Direction:** Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.
1) In many cases time inconsistency is what prevents our going from intention to action.
2) For people to continuously postpone getting their children immunized, they would need to be constantly fooled by themselves.
3) In the specific case of immunization, however, it is hard to believe that time inconsistency by itself would be sufficient to make people permanently postpone the decision if they were fully cognizant of its benefits.
4) In most cases, even a small cost of immunization was large enough to discourage most people.
5) Not only do they have to think that they prefer to spend time going to the camp next month rather than today, they also have to believe that they will indeed go next month.
Answer: 4
Solution:
All the sentences talk about time-inconsistency, citing the example of immunization, except sentence 4 which talks about the cost of immunization.
Hence, the correct answer is sentence 4.
33. **Direction:** Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.
1) Displacement in Bengal is thus not very significant in view of its magnitude.
2) A factor of displacement in Bengal is the shifting course of the Ganges leading to erosion of river banks.
3) The nature of displacement in Bengal makes it an interesting case study.
4) Since displacement due to erosion is well spread over a long period of time, it remains invisible.
5) Rapid displacement would have helped sensitize the public to its human costs.
Answer: 5
Solution:
Sentences 1-4 talk about displacement in Bengal due to the shifting course of the Ganges. Sentences 1-4 describe this shifting as a case study.

Sentence 5 dwells deeper into it as a hypothetical situation - rapid displacement - bringing into consideration its human costs and is the odd sentence out.
Hence, the correct answer is sentence 5.

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

1) The eventual diagnosis was skin cancer and after treatment all seemed well.
2) The viola player didn't know what it was; nor did her GP.
3) Then a routine scan showed it had come back and spread to her lungs.
4) It started with a lump on Cathy Perkins' index finger.

Answer:4213

Solution:

4 makes the mention of the protagonist's name and sheds some light on the onset of the disease.
2 describes her reaction to the same.
1 takes the story ahead by talking about the early diagnosis.
3 sits comfortably in the end. It mentions the latter diagnosis - a routine scan showed it had come back and spread to her lungs.
Hence, the correct answer is 4213.

SLOT-2 DILR

1.

Direction: The base exchange rate of a currency X with respect to a currency Y is the number of units of currency Y which is equivalent in value to one unit of currency X. Currency exchange outlets buy currency at buying exchange rates that are lower than base exchange rates, and sell currency at selling exchange rates that are higher than base exchange rates.

A currency exchange outlet uses the local currency L to buy and sell three international currencies A, B, and C, but does not exchange one international currency directly with another. The base exchange rates of A, B, and C with respect to L are in the ratio 100:120:1 . The buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates, and their selling exchange rates are 10% above their corresponding base exchange rates. The following facts are known about the outlet on a particular day:

1) The amount of L used by the outlet to buy C equals the amount of L it received by selling C.

2) The amounts of L used by the outlet to buy A and B are in the ratio 5 : 3.

3) The amounts of L the outlet received from the sales of A and B are in the ratio 5 : 9.

4) The outlet received 88000 units of L by selling A during the day.

5) The outlet started the day with some amount of L, 2500 units of A, 4800 units of B, and 48000 units of C.

6) The outlet ended the day with some amount of L, 3300 units of A, 4800 units of B, and 51000 units of C.

How many units of currency A did the outlet buy on that day?
Answer ||| 1200
Solution |||
It is given that the base exchange rates of A, B, and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100x', '120x', and 'x' in that order.
It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates.
Hence, buying exchange rates are 95x, 114x, 0.95x.
It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates.
Hence, the selling exchange rates are 110x, 132x, 1.1x.

				No of units

Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500			3300
B	114x	120x	132x	4800			4800
C	0.95x	x	1.1x	48000			51000

Let 'a', 'b', and 'c' be the number of units of currency A, B, and C bought by the outlet on that day.
Then, we can say that the outlet sold 'a – 800', 'b', and 'c – 3000' units of currency A, B, and C respectively.
It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500	a	a - 800	3300
B	114x	120x	132x	4800	b	B	4800
C	0.95x	x	1.1x	48000	c	c - 3000	51000

⇒ 0.95x * c = 1.1x * (c – 3000)
⇒ 0.15c = 3300
⇒ c = 22000
It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3.
$\Rightarrow \frac{a \times 95x}{b \times 114x} = \frac{5}{3}$
⇒ a = 2b
Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9.
$\Rightarrow \frac{(a-800) \times 110x}{b \times 132x} = \frac{5}{9}$
$\Rightarrow \frac{(2b-800) \times 110x}{b \times 132x} = \frac{5}{9}$
⇒ b = 600
Therefore, a = 2b = 2 * 600 = 1200.
It is given that the outlet received 88000 units of L by selling A during the day.
⇒ (a – 800) * 110x = 88000
⇒ (1200 – 800) * 110x = 88000
⇒ 44000x = 88000
⇒ x = 2
We can fill the entire table and answer all the questions.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the currency outlet bought 1200 units of A.

2.How many units of currency C did the outlet sell on that day?

A. 22000
B. 19000
C. 6000
D. 3000

Answer ||| B
Solution |||
It is given that the base exchange rates of A, B, and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100x', '120x', and 'x' in that order.
It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates.
Hence, buying exchange rates are 95x, 114x, 0.95x.
It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates.
Hence, the selling exchange rates are 110x, 132x, 1.1x.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500			3300
B	114x	120x	132x	4800			4800
C	0.95x	x	1.1x	48000			51000

Let 'a', 'b', and 'c' be the number of units of currency A, B and C bought by the outlet on that day.
Then, we can say that the outlet sold 'a – 800', 'b' and 'c – 3000' units of currency A, B and C respectively.
It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500	a	a - 800	3300
B	114x	120x	132x	4800	b	B	4800
C	0.95x	x	1.1x	48000	c	c - 3000	51000

$\Rightarrow 0.95x * c = 1.1x * (c - 3000)$
$\Rightarrow 0.15c = 3300$
$\Rightarrow c = 22000$
It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3
$\Rightarrow \frac{a \times 95x}{b \times 114x} = \frac{5}{3}$
$\Rightarrow a = 2b$
Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9
$\Rightarrow \frac{(a-800) \times 110x}{b \times 132x} = \frac{5}{9}$

$\Rightarrow \frac{(2b-800) \times 110x}{b \times 132x} = \frac{5}{9}$

⇒ b = 600

Therefore, a = 2b = 2 * 600 = 1200.

It is given that the outlet received 88000 units of L by selling A during the day.

⇒ (a – 800) * 110x = 88000

⇒ (1200 – 800) * 110x = 88000

⇒ 44000x = 88000

⇒ x = 2

We can fill the entire table and answer all the questions.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the currency outlet sold 19000 units of currency C. Hence, option B is the correct answer.

3.What was the base exchange rate of currency B with respect to currency L on that day?

Answer ||| 240

Solution |||

It is given that the base exchange rates of A, B and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100x', '120x' and 'x' in that order.

It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates.

Hence, buying exchange rates are 95x, 114x, 0.95x.

It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates.

Hence, the selling exchange rates are 110x, 132x, 1.1x.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500			3300
B	114x	120x	132x	4800			4800
C	0.95x	x	1.1x	48000			51000

Let 'a', 'b' and 'c' be the number of units of currency A, B and C bought by the outlet on that day.

Then, we can say that the outlet sold 'a – 800', 'b' and 'c – 3000' units of currency A, B and C respectively.

It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500	a	a - 800	3300

B	114x	120x	132x	4800	b	B	4800
C	0.95x	x	1.1x	48000	c	c - 3000	51000

⇒ 0.95x * c = 1.1x * (c – 3000)
⇒ 0.15c = 3300
⇒ c = 22000
It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3
⇒ $\frac{a \times 95x}{b \times 114x} = \frac{5}{3}$
⇒ a = 2b
Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9
⇒ $\frac{(a-800) \times 110x}{b \times 132x} = \frac{5}{9}$
⇒ $\frac{(2b-800) \times 110x}{b \times 132x} = \frac{5}{9}$
⇒ b = 600
Therefore, a = 2b = 2 * 600 = 1200.
It is given that the outlet received 88000 units of L by selling A during the day.
⇒ (a – 800) * 110x = 88000
⇒ (1200 – 800) * 110x = 88000
⇒ 44000x = 88000
⇒ x = 2
We can fill the entire table and answer all the questions.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the base exchange rate of currency B with respect to currency L was 240.

4.What was the buying exchange rate of currency C with respect to currency L on that day?
A. 1.10
B. 0.95
C. 2.20
D. 1.90

Answer ||| D
Solution |||
It is given that the base exchange rates of A, B and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100x', '120x' and 'x' in that order.
It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates.
Hence, buying exchange rates are 95x, 114x, 0.95x.

It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates.
Hence, the selling exchange rates are 110x, 132x, 1.1x.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500			3300
B	114x	120x	132x	4800			4800
C	0.95x	x	1.1x	48000			51000

Let 'a', 'b' and 'c' be the number of units of currency A, B and C bought by the outlet on that day.
Then, we can say that the outlet sold 'a – 800', 'b' and 'c – 3000' units of currency A, B and C respectively.
It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

				No of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95x	100x	110x	2500	a	a - 800	3300
B	114x	120x	132x	4800	b	B	4800
C	0.95x	x	1.1x	48000	c	c - 3000	51000

⇒ 0.95x * c = 1.1x * (c – 3000)
⇒ 0.15c = 3300
⇒ c = 22000
It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3
$\Rightarrow \frac{a \times 95x}{b \times 114x} = \frac{5}{3}$
⇒ a = 2b
Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9
$\Rightarrow \frac{(a-800) \times 110x}{b \times 132x} = \frac{5}{9}$
$\Rightarrow \frac{(2b-800) \times 110x}{b \times 132x} = \frac{5}{9}$
⇒ b = 600
Therefore, a = 2b = 2 * 600 = 1200.
It is given that the outlet received 88000 units of L by selling A during the day.
⇒ (a – 800) * 110x = 88000
⇒ (1200 – 800) * 110x = 88000
⇒ 44000x = 88000
⇒ x = 2
We can fill the entire table and answer all the questions.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the buying exchange rate of currency C with respect to currency L was 1.9. Hence, we can say that option D is the correct answer.
5.

Direction: Each visitor to an amusement park needs to buy a ticket. Tickets can be Platinum, Gold, or Economy. Visitors are classified as Old, Middle-aged, or Young. The following facts are known about visitors and ticket sales on a particular day:
1) 140 tickets were sold.
2) The number of Middle-aged visitors was twice the number of Old visitors, while the number of Young visitors was twice the number of Middle-aged visitors.
3) Young visitors bought 38 of the 55 Economy tickets that were sold, and they bought half the total number of Platinum tickets that were sold.
4) The number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

If the number of Old visitors buying Platinum tickets was equal to the number of Middle-aged visitors buying Platinum tickets, then which among the following could be the total number of Platinum tickets sold?
A. 34
B. 36
C. 38
D. 32

Answer ||| D
Solution |||
Let 'a' be the number of Old visitors. Then, the number of middle-aged visitors = 2a
Also, the number of Young visitors = 2 * 2a = 4a
⇒ a + 2a + 4a = 140
⇒ a = 20
It is given that a total of 55 Economy tickets were sold out.
It is given that Young visitors bought half the total number of Platinum tickets that were sold.
Let 'b' be the number of Platinum tickets bought by the Young visitors.
Then, the number of Platinum tickets sold = 2b.
Consequently, we can say that the number of Gold tickets sold = 140 – 55 – 2b = 85 – 2b

	Platinum	Gold	Economy	Total
Old				20
Middle aged				40
Young	b		38	80
Total	2b	85-2b	55	140

Let us assume that 'c' is the number of Economy tickets bought by the Old visitors. It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	20 – 2c	c	c	20
Middle aged	(b + 2c) – 20	43 - (b + c)	17 – c	40
Young	B	42 – b	38	80
Total	2b	85 - 2b	55	140

It is given that the number of Old visitors buying Platinum tickets was equal to the number of Middle-aged visitors buying Platinum tickets.
20 – 2c = (b + 2c) – 20
b + 4c = 40
2b + 8c = 80
2b = 80 – 8c
We can see that c can take only integer values. Therefore, we can say that the total number of Platinum tickets sold will be a multiple of 8. Hence, option D is the correct answer.

6. If the number of Old visitors buying Platinum tickets was equal to the number of Middle-aged visitors buying Economy tickets, then the number of Old visitors buying Gold tickets was
Answer ||| 3
Solution |||
Let 'a' be the number of Old visitors. Then, the number of middle–aged visitors = 2a.
Also, the number of Young visitors = 2 * 2a = 4a
⇒ a + 2a + 4a = 140
⇒ a = 20
It is given that a total of 55 Economy tickets were sold out.
It is given that the Young visitors bought half the total number of Platinum tickets that were sold.
Let 'b' be the number of Platinum tickets bought by the Young visitors.
Then, the number of Platinum tickets sold = 2b.
Consequently, we can say that the number of Gold tickets sold = 140 – 55 – 2b = 85 – 2b.

	Platinum	Gold	Economy	Total
Old				20
Middle aged				40
Young	b		38	80
Total	2b	85-2b	55	140

Let us assume that 'c' is the number of Economy tickets bought by the Old visitors. It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	20 – 2c	c	c	20
Middle aged	(b + 2c) – 20	43 - (b + c)	17 – c	40

Young	B	42 – b	38	80
Total	2b	85 - 2b	55	140

It is given that the number of Old visitors buying Platinum tickets was equal to the number of Middle-aged visitors buying Economy tickets.
20 – 2c = 17 – c
⇒ c = 3
Therefore, we can say that the number of Old visitors buying Gold tickets = 3

7.If the number of Old visitors buying Gold tickets was strictly greater than the number of Young visitors buying Gold tickets, then the number of Middle-aged visitors buying Gold tickets was
Answer ||| 0
Solution |||
Let 'a' be the number of Old visitors. Then, the number of middle–aged visitors = 2a
Also, the number of Young visitors = 2 * 2a = 4a
⇒ a + 2a + 4a = 140
⇒ a = 20
It is given that a total of 55 Economy tickets were sold out.
It is given that Young visitors bought half the total number of Platinum tickets that were sold.
Let 'b' be the number of Platinum tickets bought by the Young visitors.
Then, the number of Platinum tickets sold = 2b
Consequently, we can say that the number of Gold tickets sold = 140 – 55 – 2b = 85 – 2b

	Platinum	Gold	Economy	Total
Old				20
Middle aged				40
Young	b		38	80
Total	2b	85-2b	55	140

Let us assume that 'c' is the number of Economy tickets bought by the Old visitors.
It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	20 – 2c	c	c	20
Middle aged	(b + 2c) – 20	43 - (b + c)	17 – c	40
Young	B	42 – b	38	80
Total	2b	85 - 2b	55	140

It is given that the number of Old visitors buying Gold tickets was strictly greater than the number of Young visitors buying Gold tickets.
c > 42 – b
c + b > 42 ... (1)
The number of Middle-aged visitors buying Gold tickets = 43 – (b + c)
Since (b + c) > 42, then We can say that $(b + c)_{min}$ = 43.
Hence, the number of Middle–aged visitors buying Gold tickets = 43 – 43 = 0
8.Which of the following statements MUST be FALSE?
A. The numbers of Gold and Platinum tickets bought by Young visitors were equal

B. The numbers of Middle-aged and Young visitors buying Gold tickets were equal
C. The numbers of Old and Middle-aged visitors buying Platinum tickets were equal
D. The numbers of Old and Middle-aged visitors buying Economy tickets were equal

Answer ||| D
Solution |||
Let 'a' be the number of Old visitors. Then, the number of middle–aged visitors = 2a.
Also, the number of Young visitors = 2 * 2a = 4a
⇒ a + 2a + 4a = 140
⇒ a = 20
It is given that a total of 55 Economy tickets were sold out.
It is given that Young visitors half the total number of Platinum tickets that were sold.
Let 'b' be the number of Platinum tickets bought by the Young visitors.
Then, the number of Platinum tickets sold = 2b.
Consequently, we can say that the number of Gold tickets sold = 140 – 55 – 2b = 85 – 2b.

	Platinum	Gold	Economy	Total
Old				20
Middle aged				40
Young	b		38	80
Total	2b	85-2b	55	140

Let us assume that 'c' is the number of Economy tickets bought by the Old visitors.
It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	20 – 2c	c	c	20
Middle aged	(b + 2c) – 20	43 - (b + c)	17 – c	40
Young	B	42 – b	38	80
Total	2b	85 - 2b	55	140

Let us check with the help of options.
Option (A): The numbers of Gold and Platinum tickets bought by Young visitors were equal.
b = 42 – b
⇒ b = 21. Hence, this statement can be true.
Option (B): The numbers of Middle–aged and Young visitors buying Gold tickets were equal
43 – (b + c) = 42 – b
⇒ c = 1. Hence, this statement can be true.
Option (C): The numbers of Old and Middle–aged visitors buying Platinum tickets were equal
20 – 2c = (b + 2c) – 20
⇒ b + 4c = 40. Hence, this statement can be true.
Option (D): The numbers of Old and Middle–aged visitors buying Economy tickets were equal
c = 17 – c
⇒ Z = 8.5. This is not possible as c has to be an integer. Hence, we can say that this statement is false.
9.

Direction: An agency entrusted to accredit colleges looks at four parameters: faculty quality (F), reputation (R), placement quality (P), and infrastructure (I). The four parameters are used to arrive at an overall score, which the agency uses to give an accreditation to the colleges. In each parameter, there are five possible letter grades given, each carrying certain points: A (50 points), B (40 points), C (30 points), D (20 points), and F (0 points). The overall score for a college is the weighted sum of the points scored in the four parameters. The weights of the parameters are 0.1, 0.2, 0.3 and 0.4 in some order, but the order is not disclosed. Accreditation is awarded based on the following scheme:

Range	Accreditation
Overall score ≥ 45	AAA
35 ≤ Overall score < 45	BAA
25 ≤ Overall score < 35	BBA
15 ≤ Overall score < 25	BBB
Overall score < 15	Junk

Eight colleges apply for accreditation, and receive the following grades in the four parameters (F, R, P, and I):

	F	R	P	I
A-one	A	A	A	B
Best Ed	B	C	D	D
Cosmopolitan	B	D	D	C
Dominance	D	D	B	C
Education Aid	A	A	B	A
Fancy	A	A	B	B
Global	C	F	D	D
High Q	C	D	D	B

It is further known that in terms of overall scores:

1) High Q is better than Best Ed;

2) Best Ed is better than Cosmopolitan;

3) Education Aid is better than A-one.

What is the weight of the faculty quality parameter?
A. 0.2
B. 0.3
C. 0.4
D. 0.1

Answer ||| D
Solution |||
High Q > Best Ed > Cosmopolitan and Education Aid > A-one
Hence, High Q > Cosmopolitan

Both High Q and Cosmopolitan got same points in reputation (R) and placement quality (P). High Q received more points in infrastructure (I) than Cosmopolitan whereas Cosmopolitan received more points in faculty Quality (F) than High Q.
Hence, I > F
Best Ed and Cosmopolitan got same points in F and P
Best Ed received more points in R than Cosmopolitan
Cosmopolitan received more points in I than Best Ed.
Hence, R > I
Similarly, both Education Aid and A-one got same points in F and R.
Education Aid received more points in I than A-one.
A-one received more points in P than Education Aid.
Hence, I > P
Hence, there are two possible cases: R > I > P > F or R > I > F > P
Case 1: Order of weights assigned = R > I > P > F
R = 0.4, I = 0.3. P = 0.2, F = 0.1
Overall score received by Best Ed = 0.1 * 40 + 0.4 * 30 + 0.2 * 20 + 0.3 * 20 = 26
Overall score received by High Q = 0.1 * 30 + 0.4 * 20 + 0.2 * 20 + 0.3 * 40 = 27
High Q's overall score is higher than Best Ed. Hence, this case is possible.
Case 2: Order of weights assigned = R > I > F > P
R = 0.4, I = 0.3. P = 0.1, F = 0.2
Overall score received by Best Ed = 0.2*40+0.4*30+0.1*20+0.3*20 = 28
Overall score received by High Q = 0.2*30+0.4*20+0.1*20+0.3*40 = 28
Best Ed's overall score is not less than the overall score received by High Q's. Hence, this case is not possible.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

We can see that weight of the faculty quality parameter = 0.1. Hence, option D is the correct answer.

10.How many colleges receive the accreditation of AAA?
Answer ||| 3
Solution |||
High Q > Best Ed > Cosmopolitan and Education Aid > A-one
Hence, High Q > Cosmopolitan
Both High Q and Cosmopolitan got same points in reputation (R) and placement quality (P). High Q received more points in infrastructure (I) than Cosmopolitan whereas Cosmopolitan received more points in faculty Quality (F) than High Q.
Hence, I > F
Best Ed and Cosmopolitan got same points in F and P
Best Ed received more points in R than Cosmopolitan
Cosmopolitan received more points in I than Best Ed.

Hence, R > I
Similarly, both Education Aid and A-one got same points in F and R.
Education Aid received more points in I than A-one.
A-one received more points in P than Education Aid.
Hence, I > P
Hence, there are two possible cases: R > I > P > F or R > I > F > P
Case 1: Order of weights assigned = R > I > P > F
R = 0.4, I = 0.3. P = 0.2, F = 0.1
Overall score received by Best Ed = 0.1 * 40 + 0.4 * 30 + 0.2 * 20 + 0.3 * 20 = 26
Overall score received by High Q = 0.1 * 30 + 0.4 * 20 + 0.2 * 20 + 0.3 * 40 = 27
High Q's overall score is higher than Best Ed. Hence, this case is possible.
Case 2: Order of weights assigned = R > I > F > P
R = 0.4, I = 0.3. P = 0.1, F = 0.2
Overall score received by Best Ed = 0.2*40+0.4*30+0.1*20+0.3*20 = 28
Overall score received by High Q = 0.2*30+0.4*20+0.1*20+0.3*40 = 28
Best Ed's overall score is not less than the overall score received by High Q's. Hence, this case is not possible.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

From the table, we can see that three received the accreditation of AAA .

11.What is the highest overall score among the eight colleges?
Answer ||| 48
Solution |||
High Q > Best Ed > Cosmopolitan and Education Aid > A-one
Hence, High Q > Cosmopolitan
Both High Q and Cosmopolitan got same points in reputation (R) and placement quality (P). High Q received more points in infrastructure (I) than Cosmopolitan whereas Cosmopolitan received more points in faculty Quality (F) than High Q.
Hence, I > F
Best Ed and Cosmopolitan got same points in F and P
Best Ed received more points in R than Cosmopolitan
Cosmopolitan received more points in I than Best Ed.
Hence, R > I
Similarly, both Education Aid and A-one got same points in F and R.
Education Aid received more points in I than A-one.
A-one received more points in P than Education Aid.
Hence, I > P
Hence, there are two possible cases: R > I > P > F or R > I > F > P
Case 1: Order of weights assigned = R > I > P > F
R = 0.4, I = 0.3. P = 0.2, F = 0.1

Overall score received by Best Ed = 0.1 * 40 + 0.4 * 30 + 0.2 * 20 + 0.3 * 20 = 26
Overall score received by High Q = 0.1 * 30 + 0.4 * 20 + 0.2 * 20 + 0.3 * 40 = 27
High Q's overall score is higher than Best Ed. Hence, this case is possible.
Case 2: Order of weights assigned = R > I > F > P
R = 0.4, I = 0.3. P = 0.1, F = 0.2
Overall score received by Best Ed = 0.2*40+0.4*30+0.1*20+0.3*20 = 28
Overall score received by High Q = 0.2*30+0.4*20+0.1*20+0.3*40 = 28
Best Ed's overall score is not less than the overall score received by High Q's. Hence, this case is not possible.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

From the table we can see that Education Aid scored the highest overall score = 48.

12.How many colleges have overall scores between 31 and 40, both inclusive?
A. 0
B. 2
C. 1
D. 3

Answer ||| A
Solution |||
High Q > Best Ed > Cosmopolitan and Education Aid > A-one
Hence, High Q > Cosmopolitan
Both High Q and Cosmopolitan got same points in reputation (R) and placement quality (P). High Q received more points in infrastructure (I) than Cosmopolitan whereas Cosmopolitan received more points in faculty Quality (F) than High Q.
Hence, I > F
Best Ed and Cosmopolitan got same points in F and P
Best Ed received more points in R than Cosmopolitan
Cosmopolitan received more points in I than Best Ed.
Hence, R > I
Similarly, both Education Aid and A-one got same points in F and R.
Education Aid received more points in I than A-one.
A-one received more points in P than Education Aid.
Hence, I > P
Hence, there are two possible cases: R > I > P > F or R > I > F > P
Case 1: Order of weights assigned = R > I > P > F
R = 0.4, I = 0.3. P = 0.2, F = 0.1
Overall score received by Best Ed = 0.1 * 40 + 0.4 * 30 + 0.2 * 20 + 0.3 * 20 = 26
Overall score received by High Q = 0.1 * 30 + 0.4 * 20 + 0.2 * 20 + 0.3 * 40 = 27
High Q's overall score is higher than Best Ed. Hence, this case is possible.
Case 2: Order of weights assigned = R > I > F > P

R = 0.4, I = 0.3. P = 0.1, F = 0.2
Overall score received by Best Ed = 0.2*40+0.4*30+0.1*20+0.3*20 = 28
Overall score received by High Q = 0.2*30+0.4*20+0.1*20+0.3*40 = 28
Best Ed's overall score is not less than the overall score received by High Q's. Hence, this case is not possible.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

None of the mentioned college received an overall scores between 31 and 40, both inclusive. Hence, option A is the correct answer.
13.

Direction: Fun Sports (FS) provides training in three sports - Gilli-danda (G), Kho-Kho (K), and Ludo (L). Currently it has an enrollment of 39 students each of whom is enrolled in at least one of the three sports. The following details are known:

1) The number of students enrolled only in L is double the number of students enrolled in all the three sports.

2) There are a total of 17 students enrolled in G.

3) The number of students enrolled only in G is one less than the number of students enrolled only in L.

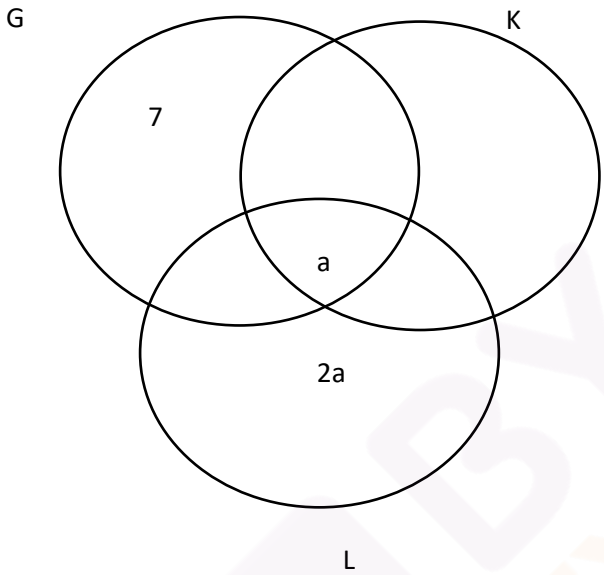
4) The number of students enrolled only in K is equal to the number of students who are enrolled in both K and L.

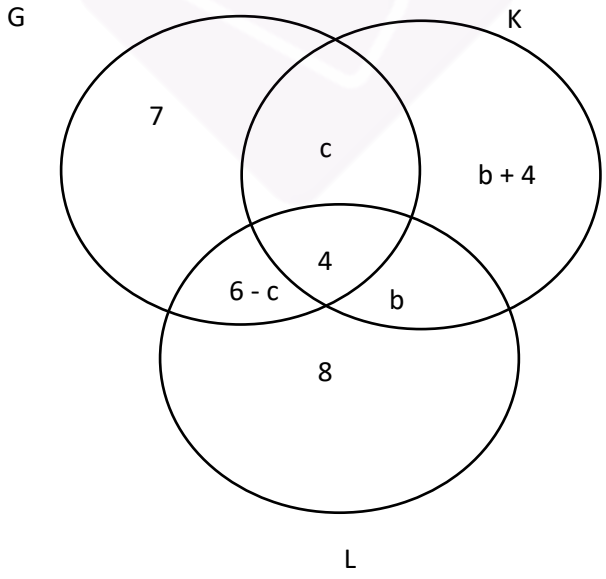
5) The maximum student enrollment is in L.

6) Ten students enrolled in G are also enrolled in at least one more sport.

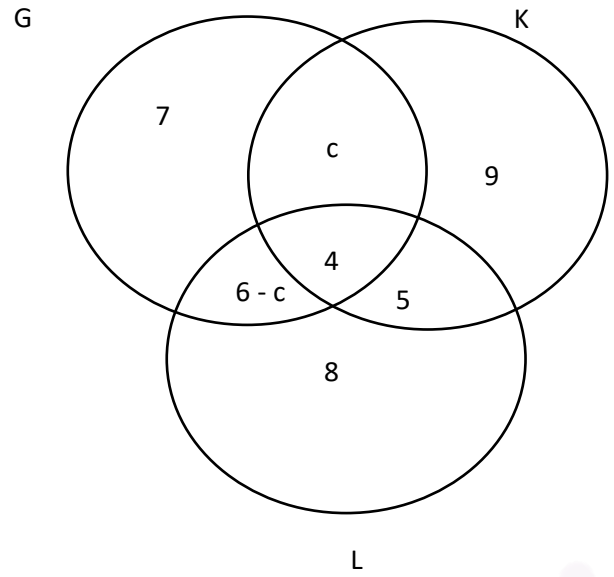
What is the minimum number of students enrolled in both G and L but not in K?
Answer ||| 4
Solution |||
Let 'a' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = 2a
There are a total of 17 students enrolled in G.
10 students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = 17 – 10 = 7

The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the number of students enrolled only in L = 7 + 1
⇒ 2a = 8
⇒ a = 4
Let us assume that 'b' students are enrolled in K and L but not G. Then, the number of students enrolled only in K = b + 4
Let us assume that 'c' be the number of students enrolled in G and K but not L. Then, the number of students enrolled G and L bot not K = 10 – 4 – c = 6 – c





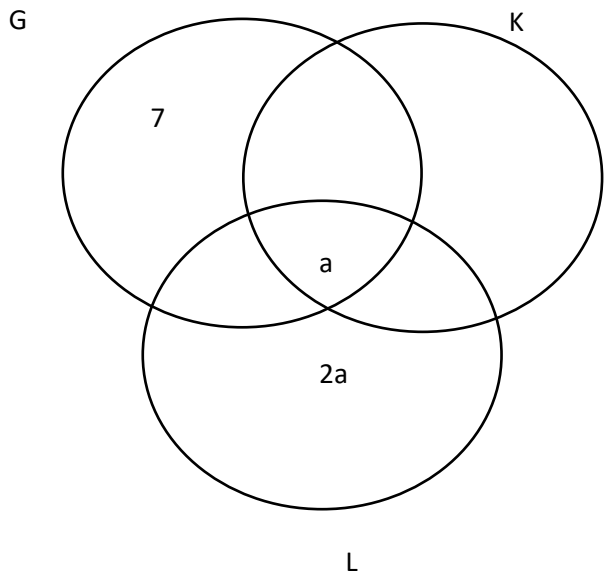
It is given that a total of 39 students in the sports.
7 + c + 4 + 6 – c + 8 + b + b + 4 = 39
⇒ b = 5



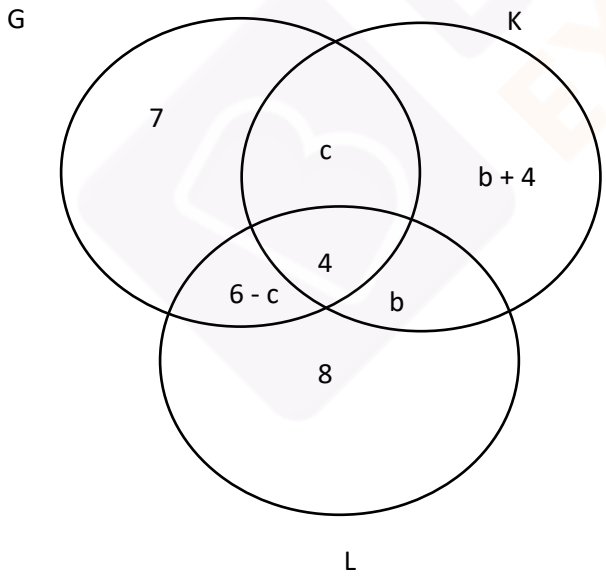
Number of students enrolled in G = 17
Number of students enrolled in K = 9 + 4 + 5 + c = 18 + c
Number of students enrolled in L = 6 – c + 4 + 5 + 8 = 23 – c
It is given that the maximum student enrollment is in L.
⇒ 23 – c > 18 + c
⇒ 2c < 5
⇒ c < 2.5
Therefore, we can say that c can take three values = {0, 1, 2}
The number of students enrolled in both G and L but not in K = 6 – c. This number will be minimum when 'c' is maximum. c_{max} = 2
Therefore, the minimum number of students enrolled in both G and L but not in K = 6 – 2 = 4

14.If the numbers of students enrolled in K and L are in the ratio 19:22, then what is the number of students enrolled in L?
A. 18
B. 17
C. 22
D. 19

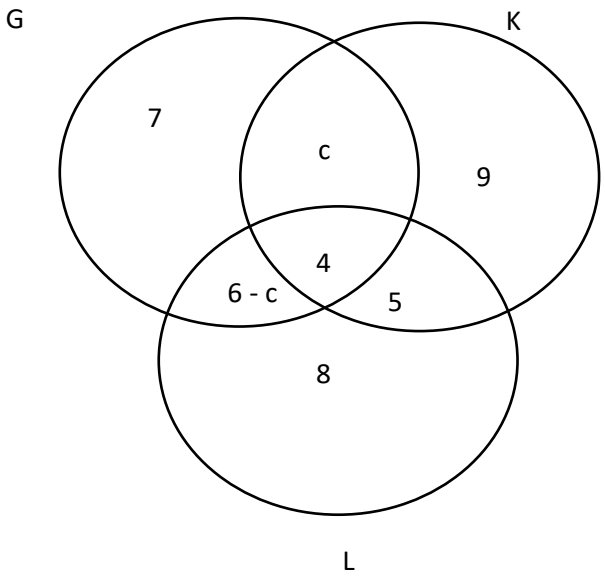
Answer ||| C
Solution |||
Let 'a' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = 2a
There are a total of 17 students enrolled in G.
10 students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = 17 – 10 = 7



The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the number of students enrolled only in L = 7 + 1
⇒ 2a = 8
⇒ a = 4
Let us assume that 'b' students are enrolled in K and L but not G. Then, the number of students enrolled only in K = b + 4
Let us assume that 'c' be the number of students enrolled in G and K but not L. Then, the number of students enrolled G and L bot not K = 10 – 4 – c = 6 – c

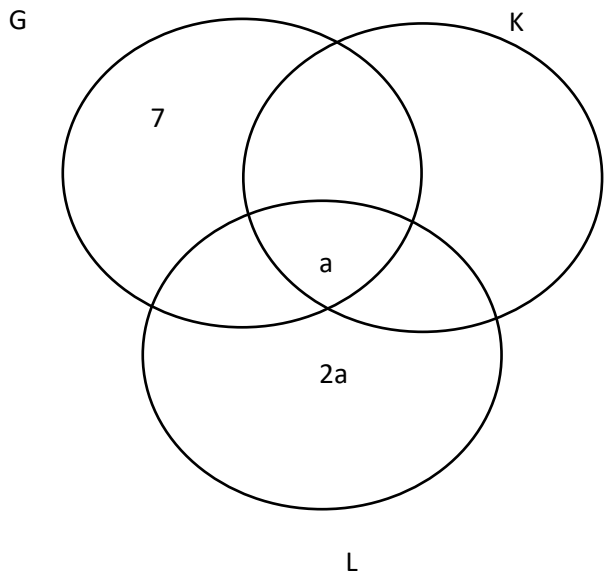


It is given that a total of 39 students in the sports.
7 + c + 4 + 6 – c + 8 + b + b + 4 = 39
⇒ b = 5

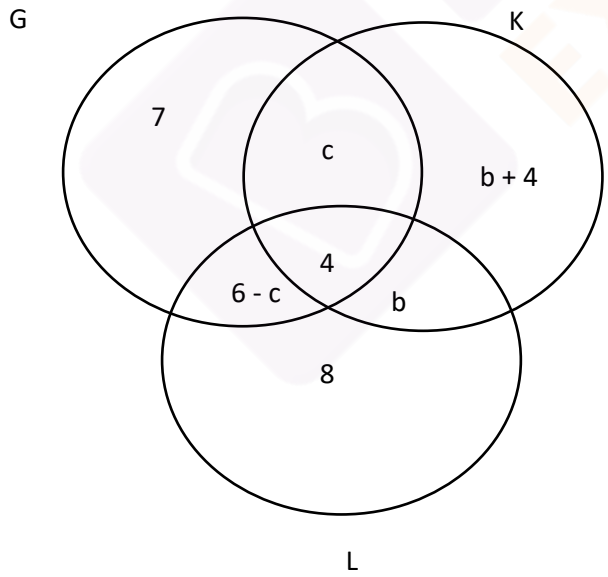


Number of students enrolled in G = 17
Number of students enrolled in K = 9 + 4 + 5 + c = 18 + c
Number of students enrolled in L = 6 – c + 4 + 5 + 8 = 23 – c
It is given that the maximum student enrollment is in L.
⇒ 23 – c > 18 + c
⇒ 2c < 5
⇒ c < 2.5
Therefore, we can say that c can take three values = {0, 1, 2}
It is given that the numbers of students enrolled in K and L are in the ratio 19:22.
$\frac{18+c}{23-c} = \frac{19}{22}$
Hence, c = 1 which is a possible solution as well.
In this case the number of students enrolled in L = 23 – c = 23 – 1 = 22. Hence, option C is the correct answer.

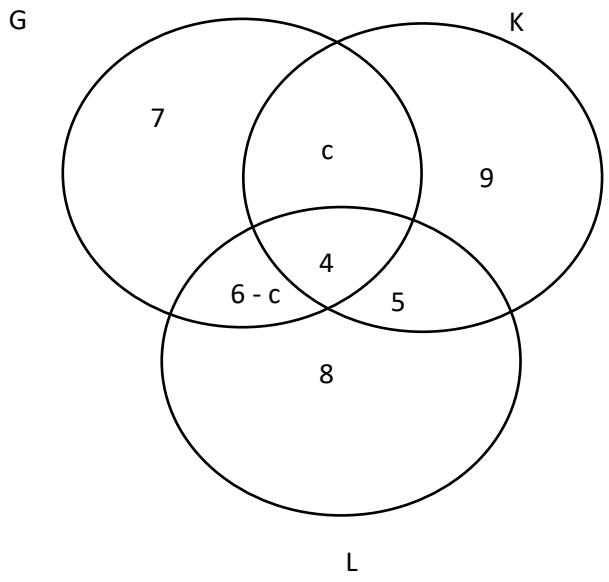
15.Due to academic pressure, students who were enrolled in all three sports were asked to withdraw from one of the three sports. After the withdrawal, the number of students enrolled in G was six less than the number of students enrolled in L, while the number of students enrolled in K went down by one. After the withdrawal, how many students were enrolled in both G and K?
Answer ||| 2
Solution |||
Let 'a' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = 2a
There are a total of 17 students enrolled in G.
10 students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = 17 – 10 = 7



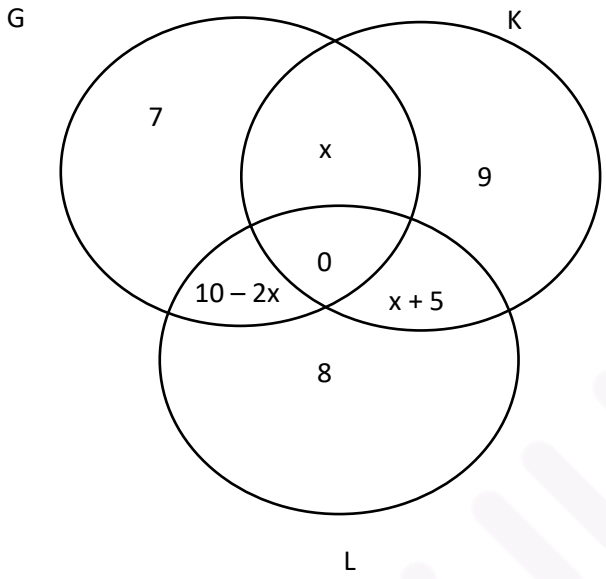
The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the number of students enrolled only in L = 7 + 1
⇒ 2a = 8
⇒ a = 4
Let us assume that 'b' students are enrolled in K and L but not G. Then, the number of students enrolled only in K = b + 4
Let us assume that 'c' be the number of students enrolled in G and K but not L. Then, the number of students enrolled G and L bot not K = 10 – 4 – c = 6 – c



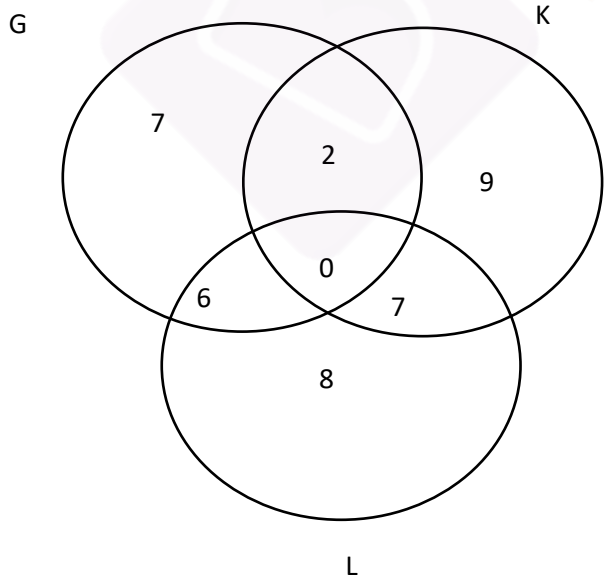
It is given that a total of 39 students in the sports.
7 + c + 4 + 6 – c + 8 + b + b + 4 = 39
⇒ b = 5



Number of students enrolled in G = 17
Number of students enrolled in K = 9 + 4 + 5 + c = 18 + c
Number of students enrolled in L = 6 – c + 4 + 5 + 8 = 23 – c
It is given that the maximum student enrollment is in L.
⇒ 23 – c > 18 + c
⇒ 2c < 5
⇒ c < 2.5
Therefore, we can say that c can take three values = {0, 1, 2}
Hence, the number of students enrolled in K = 18 + z = {18, 19, 20}
It is given that after withdrawal, the number of students enrolled in K went down by one. This one student must have left sports K. Hence, the remaining 3 students must have left either G or L.
Before withdrawal, there were a total of 24 students were enrolled in exactly 1 sport, 11 students were enrolled in exactly 2 courses and 4 students were enrolled in all three sports.
The students who were enrolled in all three sports, withdrew from one of the sports.
Hence, the number of students who were enrolled in exactly 2 sports = 11 + 4 = 15.
Let 'x' be the number of students who were enrolled in G and K but not L. Then, the number of students who were enrolled in L and K but not G = x + 5
Consequently, we can say that the number of students enrolled in G and L but not K = 15 – (2x + 5) = 10 – 2x



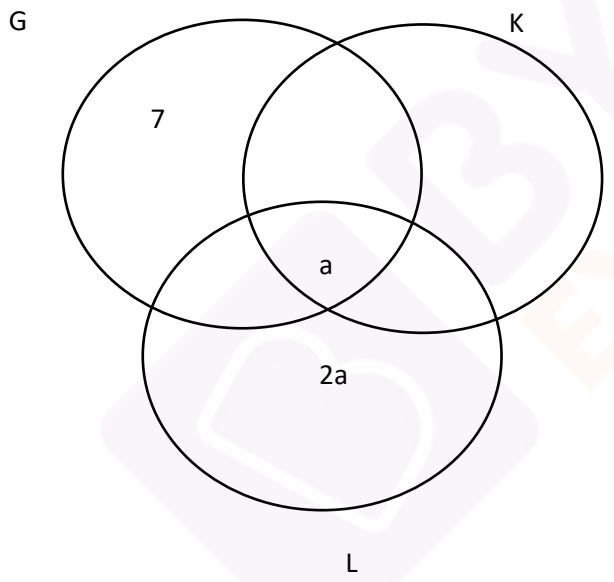
Number of students enrolled in this case = x + x + 5 + 9 = 14 + 2x. We can see that '14 + 2x' is an even number. It is given that the number of students enrolled in K went down by one. Therefore, we can say that the number of students enrolled in K earlier was an odd number.
Hence, the number of students enrolled in K = 18 + c = {18, 19, 20}
We can see that only '19' is an odd number. Hence, we can say that the number of students enrolled in K after withdrawal = 18
⇒ 14 + 2x = 18
⇒ x = 2



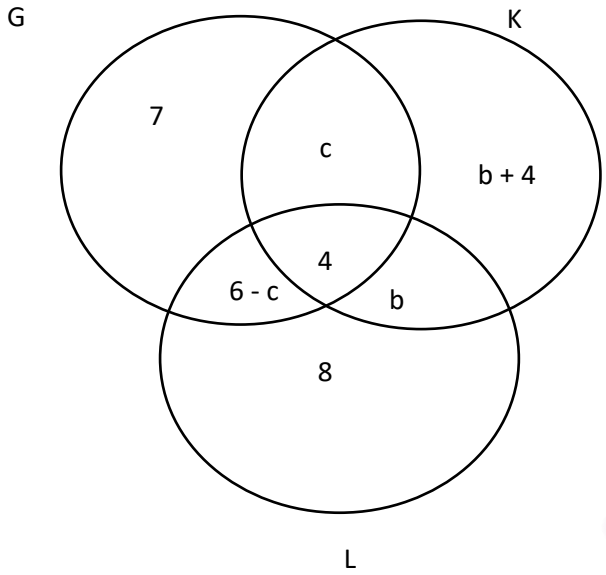
Hence, the number of students enrolled in both G and K = 2.

16.Due to academic pressure, students who were enrolled in all three sports were asked to withdraw from one of the three sports. After the withdrawal, the number of students enrolled in G was six less than the number of students enrolled in L, while the number of students enrolled in K went down by one. After the withdrawal, how many students were enrolled in both G and L?
A. 6
B. 5
C. 7
D. 8

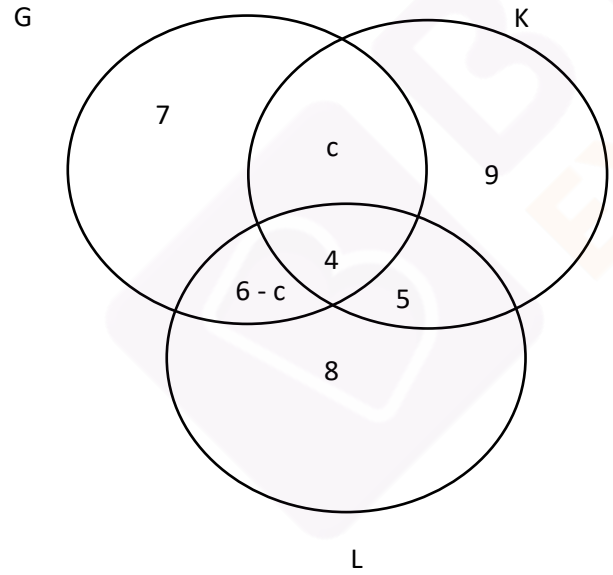
Answer ||| A
Solution |||
Let 'a' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = 2a
There are a total of 17 students enrolled in G.
10 students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = 17 – 10 = 7



The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the number of students enrolled only in L = 7 + 1
⇒ 2a = 8
⇒ a = 4
Let us assume that 'b' students are enrolled in K and L but not G. Then, the number of students enrolled only in K = b + 4
Let us assume that 'c' be the number of students enrolled in G and K but not L. Then, the number of students enrolled G and L bot not K = 10 – 4 – c = 6 – c

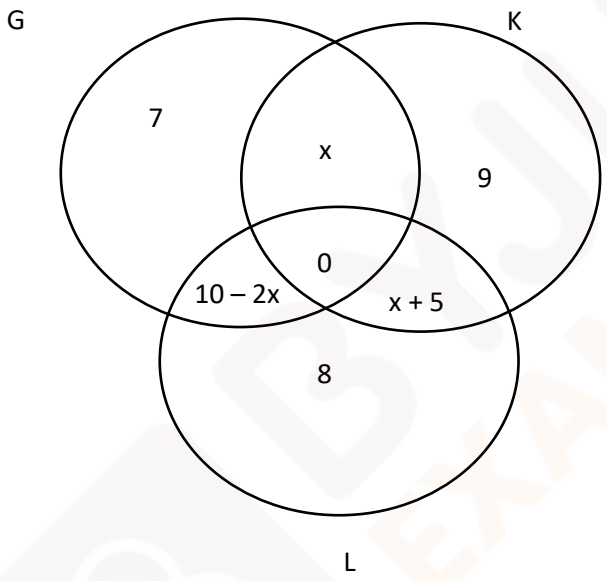


It is given that a total of 39 students in the sports.
$7 + c + 4 + 6 - c + 8 + b + b + 4 = 39$
$\Rightarrow b = 5$



Number of students enrolled in G = 17
Number of students enrolled in K = $9 + 4 + 5 + c = 18 + c$
Number of students enrolled in L = $6 - c + 4 + 5 + 8 = 23 - c$
It is given that the maximum student enrollment is in L.
$\Rightarrow 23 - c > 18 + c$
$\Rightarrow 2c < 5$
$\Rightarrow c < 2.5$
Therefore, we can say that c can take three values = {0, 1, 2}

Hence, the number of students enrolled in K = 18 + z = {18, 19, 20}
It is given that after withdrawal, the number of students enrolled in K went down by one. This one student must have left sports K. Hence, the remaining 3 students must have left either G or L.
Before withdrawal, there were a total of 24 students were enrolled in exactly 1 sport, 11 students were enrolled in exactly 2 courses and 4 students were enrolled in all three sports.
The students who were enrolled in all three sports, withdrew from one of the sports.
Hence, the number of students who were enrolled in exactly 2 sports = 11 + 4 = 15.
Let 'x' be the number of students who were enrolled in G and K but not L. Then, the number of students who were enrolled in L and K but not G = x + 5
Consequently, we can say that the number of students enrolled in G and L but not K = 15 – (2x + 5) = 10 – 2x



Number of students enrolled in this case = x + x + 5 + 9 = 14 + 2x. We can see that '14 + 2x' is an even number. It is given that the number of students enrolled in K went down by one. Therefore, we can say that the number of students enrolled in K earlier was an odd number.
Hence, the number of students enrolled in K = 18 + c = {18, 19, 20}
We can see that only '19' is an odd number. Hence, we can say that the number of students enrolled in K after withdrawal = 18
⇒ 14 + 2x = 18
⇒ x = 2
The number of students enrolled in both G and L = 6. Hence, option A is the correct answer.
17.

Direction: According to a coding scheme the sentence:

"Peacock is designated as the national bird of India" is coded as 5688999 35 1135556678 56 458 13666689 1334 79 13366

This coding scheme has the following rules:

a: The scheme is case-insensitive. (does not distinguish between uppercase and lowercase letters)

b: Each letter has a unique code which is a single digit from among 1,2,3, …, 9

c: The digit 9 codes two letters, and every other digit codes three letters.

d: The code for a word is constructed by arranging the digits corresponding to its letters in a non-decreasing sequence.

Answer these questions on the basis of this information.

What best can be concluded about the code for the letter L?A. 1
B. 8
C. 1 or 8
D. 6

Answer ||| A
Solution |||

Peacock	is	designated	as	the	national	bird	of	India
5688999	35	1135556678	56	458	13666689	1334	79	13366

India's code is 13366 therefore we can say that I's code is either 3 or 6.
The code for the word "is" is 35, hence, I's code is 3 and S's code is 5.
The code of the word 'as' is 56, hence, we can say that A's code is 6.
There is only one letter 'O' common in words 'of' and 'national'. In code words as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9' and F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets and one of them is 'O'.
There are three 9's in Peacock's code.
One of the digits '9' is used for 'O'. Remaining two 9's must represent the same letter.
We can see that only the letter 'C' has appeared twice in Peacock. Hence, 'C' is coded '9'.
The word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6' and the code for letter 'D' is '1'

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common.
Hence, the code for letter 't' is 8.
In words, 'the' and 'peacock' only have the letter 'e' is common.
Hence, the code for letter 'e' is 5.

'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

We can see that code for the word "NATIONAL" is 13666689. Hence, we can say that the code for the letter L is '1'. Hence, option A is the correct answer.

18.What best can be concluded about the code for the letter B?

A. 3 or 4

B. 1 or 3 or 4

C. 1

D. 3

Answer ||| A

Solution |||

Peacock	is	designated	as	the	national	bird	of	India
5688999	35	1135556678	56	458	13666689	1334	79	13366

India's code is 13366 therefore we can say that I's code is either 3 or 6.

The code for the word "is" is 35, hence, I's code is 3 and S's code is 5.

The code of the word 'as' is 56, hence, we can say that A's code is 6.

There is only one letter 'O' common in words 'of' and 'national'. In code words as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9' and F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets and one of them is 'O'.

There are three 9's in Peacock's code.

One of the digits '9' is used for 'O'. Remaining two 9's must represent the same letter.

We can see that only the letter 'C' has appeared twice in Peacock. Hence, 'C' is coded '9'.

In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6' and the code for letter 'D' is '1'

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common.

Hence, the code for letter 't' is 8.

In words, 'the' and 'peacock' only have the letter 'e' is common.

Hence, the code for letter 'e' is 5.

'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	L, D		I	H	S, E	N, A	F	T	C, O

We can see that the code for the word "BIRD" is 1334. 1 corresponds to D and one 3 corresponds to I. Hence, the code for letters 'R' and 'B' are '3' and '4' in any order.

Therefore, we can say that for letter 'B' there are two possible numbers: 3 or 4

Hence, option A is the correct answer.

19.For how many digits can the complete list of letters associated with that digit be identified?

A. 1

B. 2

C. 0
D. 3

Answer ||| B
Solution |||

Peacock	is	designated	as	the	national	bird	of	India
5688999	35	1135556678	56	458	13666689	1334	79	13366

India's code is 13366 therefore we can say that I's code is either 3 or 6.
The code for the word "is" is 35, hence, I's code is 3 and S's code is 5.
The code of the word 'as' is 56, hence, we can say that A's code is 6.
There is only one letter 'O' common in words 'of' and 'national'. In code words as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9' and F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets and one of them is 'O'.
There are three 9's in Peacock's code.
One of the digits '9' is used for 'O'. Remaining two 9's must represent same letter.
We can see that only the letter 'C' has appeared twice in Peacock. Hence, 'C' is coded '9'.
In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6' and the code for letter 'D' is '1'

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common.
Hence, the code for letter 't' is 8.
In words, 'the' and 'peacock' only have the letter 'e' is common.
Hence, the code for letter 'e' is 5.
'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

We can see that the code for the word "NATIONAL" is 13666689. Hence, we can say that the code for the letter L is '1'.

1	D,L
2	
3	I
4	H
5	E,S
6	N,A
7	G,F
8	K,P,T
9	C,O

Therefore, we can say that for only two digits (8 and 9), the complete list of letters associated is known. Hence, option B is the correct answer.

20.Which set of letters CANNOT be coded with the same digit?

A. S, E, Z
B. I, B, M
C. S, U, V
D. X, Y, Z

Answer ||| C
Solution |||

Peacock	is	designated	as	the	national	bird	of	India
5688999	35	1135556678	56	458	13666689	1334	79	13366

India's code is 13366 therefore we can say that I's code is either 3 or 6.
The code for the word "is" is 35, hence, I's code is 3 and S's code is 5.
The code of the word 'as' is 56, hence, we can say that A's code is 6.
There is only one letter 'O' common in words 'of' and 'national'. In code words as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9' and F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets and one of them is 'O'.
There are three 9's in Peacock's code.
One of the digits '9' is used for 'O'. Remaining two 9's must represent the same letter.
We can see that only the letter 'C' has appeared twice in Peacock. Hence, 'C' is coded '9'.
In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6' and the code for letter 'D' is '1'

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common.
Hence, the code for letter 't' is 8.
In words, 'the' and 'peacock' only have the letter 'e' is common.
Hence, the code for letter 'e' is 5.
'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

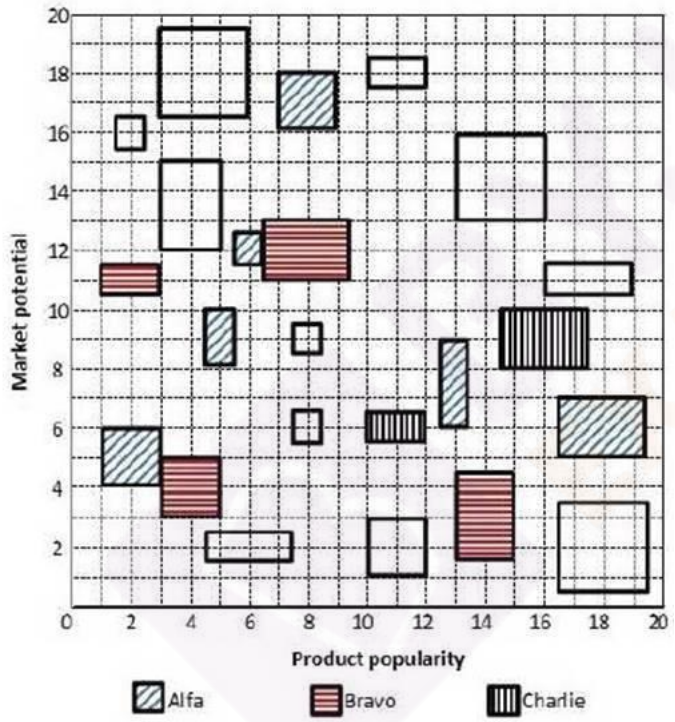
We can see that the code for the word "NATIONAL" is 13666689. Hence, we can say that the code for the letter L is '1'.

1	D,L
2	
3	I
4	H
5	E,S
6	N,A
7	G,F
8	K,P,T
9	C,O

We can see that the code for the word "PEACOCK" is 5688999. Hence, we can say that the code for the letters 'P' and 'K' is '8'.

Let us check this by options:
(A) S, E, Z: If letter 'Z' is assigned code '5' then this case is possible.
(B) I, B, M: If letters 'B' and 'M' are assigned code '3' then this case is possible.
(C) S, U, V: If letters 'U' and 'V' are assigned code '5' then this case is possible. But in that case digit 5 will have 4 letters associated with it which is not possible. Hence, this is the answer.
(D) X, Y, Z: If letters 'X', 'Y' and 'Z' are assigned code '2' then this case is possible.
21.

Direction: Each of the 23 boxes in the picture below represents a product manufactured by one of the following three companies: Alfa, Bravo and Charlie. The area of a box is proportional to the revenue from the corresponding product, while its centre represents the Product popularity and Market potential scores of the product (out of 20). The shadings of some of the boxes have got erased.



The companies classified their products into four categories based on a combination of scores (out of 20) on the two parameters -Product popularity and Market potential as given below:

	Promising	Blockbuster	Doubtful	No-hope
Product popularity score	>10	>10	≤10	≤10
Market potential score	>10	≤10	>10	≤10

The following facts are known:

1) Alfa and Bravo had the same number of products in the Blockbuster category.

2) Charlie had more products than Bravo but fewer products than Alfa in the No-hope category.

3) Each company had an equal number of products in the Promising category.

4) Charlie did not have any product in the Doubtful category, while Alfa had one product more than Bravo in this category

5) Bravo had a higher revenue than Alfa from products in the Doubtful category.

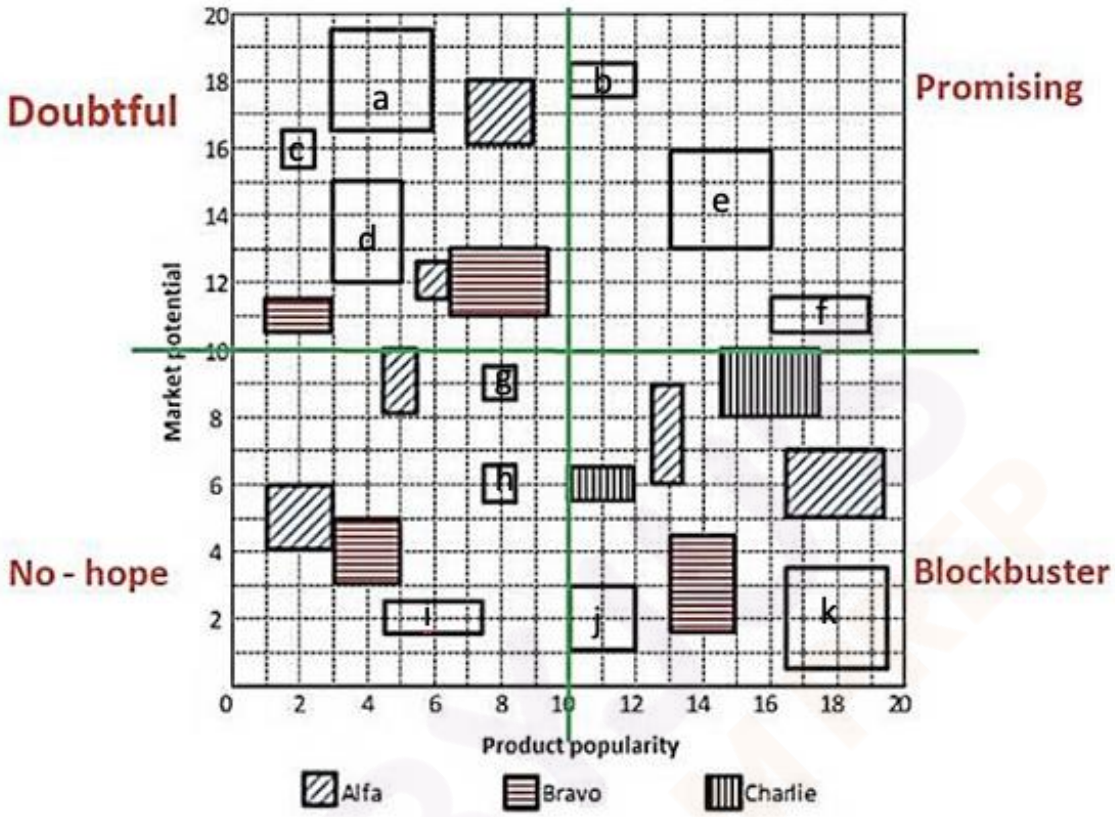
6) Charlie had a higher revenue than Bravo from products in the Blockbuster category.

7) Bravo and Charlie had the same revenue from products in the No-hope category.

8) Alfa and Charlie had the same total revenue considering all products.

Considering all companies' products, which product category had the highest revenue?
A. No-hope
B. Blockbuster
C. Doubtful
D. Promising

Answer ||| B
Solution |||
Let us divide the given figure in four quadrants (Q1, Q2, Q3, Q4).



The letters correspond to the given companies.

Alfa	**b, c, d, g/h**
Bravo	**a, f, j**
Charlie	**e, h/g, i, k**

Areas of the categories:
No hope = 4 + 4 + 3 + 2 + 1 + 1 = 15
Blockbuster = 2 + 4 + 3 + 6 + 6 + 6 + 9 = 36
Doubtful = 2 + 1 + 6 + 6 + 1 + 9 + 4 = 29
Promising = 2 + 9 + 3 = 14
Since, area is proportional to the revenue, blockbuster had the highest revenue.
22.Which of the following is the correct sequence of numbers of products Bravo had in No-hope, Doubtful, Promising and Blockbuster categories respectively?
A. 1, 3, 1, 2
B. 1, 3, 1, 3
C. 3, 3, 1, 2
D. 2, 3, 1, 2

Answer ||| A
Bravo had in No–hope, Doubtful, Promising and Blockbuster categories respectively = 1, 3, 1, 2. Hence, option A is the correct answer.
23.Which of the following statements is NOT correct?

A. Alfa's revenue from Blockbuster products was the same as Charlie's revenue from Promising products
B. Bravo's revenue from Blockbuster products was greater than Alfa's revenue from Doubtful products
C. Bravo and Charlie had the same revenues from No-hope products
D. The total revenue from No-hope products was less than the total revenue from Doubtful products

Answer ||| B
Solution |||
Let us go from the options:
Option (A): Alfa's revenue from Blockbuster products was the same as Charlie's revenue from Promising products Alfa's revenue from Blockbuster products = 6 + 3 = 9 units.
Charlie's revenue from Promising products = 9 units. Hence, this statement is true.
Option (B): Bravo's revenue from Blockbuster products was greater than Alfa's revenue from Doubtful products.
Bravo's revenue from Blockbuster products = 6 + 4 = 10 units.
Alfa's revenue from Doubtful products = 6 + 4 + 1 + 1 = 12 units. Hence, this statement is false.
Option (C): Bravo and Charlie had the same revenues from No-hope products.
Bravo's revenue from No-hope products = 4 units.
Charlie's revenue from No-hope products = 3 + 1 = 4 units. Hence, this statement is true.
Option (D): The total revenue from No-hope products was less than the total revenue from Doubtful products
Revenue generated by the products in Doubtful category = 1 + 9 + 4 + 6 + 2 + 1 + 6 = 29 units.
Revenue generated by the products in No-hope category = 4 + 4 + 3 + 2 + 1 + 1 = 15 units. Hence, this statement is true.
Hence, option B is the correct answer.
24.If the smallest box on the grid is equivalent to revenue of Rs.1 crore, then what approximately was the total revenue of Bravo in Rs. crore?
A. 40
B. 24
C. 34
D. 30

Answer ||| C
Solution |||
Total revenue generated by Bravo products alone = From Blockbuster + From No-hope + From Doubtful + From Promising
⇒ (6 + 4) + (4) + (9 + 6 + 2) + (3) = 34 units
One box is equivalent to Rs. 1 crore .
Hence, the total revenue generated by Bravo = Rs. 34 crores. Hence, option C is the correct answer.
25.

Direction: Seven candidates, Akil, Balaram, Chitra, Divya, Erina, Fatima, and Ganeshan, were invited to interview for a position. Candidates were required to reach the venue before 8 am. Immediately upon arrival, they were sent to one of three interview rooms: 101, 102, and 103. The following venue log shows the arrival times for these candidates. Some of the names have not been recorded in the log and have been marked as '?'.

Time	7:10 AM	7:15 AM	7:25 AM	7:30 AM	7:40 AM	7:45 AM
Person	Akil, ?	?	?	Chitra	Fatima	?

Additionally here are some statements from the candidates:

Balaram: I was the third person to enter Room 101.

Chitra: I was the last person to enter the room I was allotted to.

Erina: I was the only person in the room I was allotted to.

Fatima: Three people including Akhil were already in the room that I was allotted to when I entered it.

Ganeshan : I was one among the two candidates allotted to Room 102.

What best can be said about the room to which Divya was allotted?A. Definitely Room 101
B. Definitely Room 103
C. Definitely Room 102
D. Either Room 101 or Room 102

Answer ||| A
Solution |||
Balram - 3rd to enter 101.
Erina – either 102 or 103.
3 persons entered before Fatima, hence, Akil and Fatima entered 101.
Ganeshan and another person entered 102.
Hence, only Erina entered 103.
Chitra was the last to enter, hence she entered with Ganeshan to room 102.
Divya was the 2nd to enter 101.

101	102	103
Akil (7:10)	Ganeshan	Erina(7:45)
Divya	Chitra(7:30)	
Balaram		
Fatima(7:40)		

From the table we can see that Divya was allotted room no 101. Hence, option A is the correct answer.
26.Who else was in Room 102 when Ganeshan entered?

A. Akil
B. Divya
C. Chitra
D. No one

Answer ||| D
Solution |||
Balram - 3rd to enter 101.
Erina – either 102 or 103.
3 persons entered before Fatima, hence, Akil and Fatima entered 101.
Ganeshan and another person entered 102.
Hence, only Erina entered 103.
Chitra was the last to enter, hence she entered with Ganeshan to room 102.
Divya was the 2nd to enter 101.

101	102	103
Akil (7:10)	Ganeshan	Erina(7:45)
Divya	Chitra(7:30)	
Balaram		
Fatima(7:40)		

From the table we can see that Ganeshan is the first person to enter room 102. Hence, option D is the correct answer.
27.When did Erina reach the venue?
A. 7:45 am
B. 7:25 am
C. 7:15 am
D. 7:10 am

Answer ||| A
Solution |||
Balram - 3rd to enter 101.
Erina – either 102 or 103.
3 persons entered before Fatima, hence, Akil and Fatima entered 101.
Ganeshan and another person entered 102.
Hence, only Erina entered 103.
Chitra was the last to enter, hence she entered with Ganeshan to room 102.
Divya was the 2nd to enter 101.

101	102	103
Akil (7:10)	Ganeshan	Erina(7:45)
Divya	Chitra(7:30)	
Balaram		
Fatima(7:40)		

From the table we can see that Erina reached the venue at 7:45 am. Hence, option A is the correct answer.
28.If Ganeshan entered the venue before Divya, when did Balaram enter the venue?

A. 7:25 am
B. 7:10 am
C. 7:15 am
D. 7:45 am

Answer ||| A
Solution |||
Balram - 3rd to enter 101.
Erina – either 102 or 103.
3 persons entered before Fatima, hence, Akil and Fatima entered 101.
Ganeshan and another person entered 102.
Hence, only Erina entered 103.
Chitra was the last to enter, hence she entered with Ganeshan to room 102.
Divya was the 2nd to enter 101.

101	102	103
Akil (7:10)	Ganeshan	Erina(7:45)
Divya	Chitra(7:30)	
Balaram		
Fatima(7:40)		

Ganeshan entered the venue before Divya. Hence, Ganeshan must have entered with Akhil at 7:10 am. In that case, Divya and Balaram must have entered at 7:15 am and 7:25 am respectively. Hence, option A is the correct answer.
29.

Direction: There are only four brands of entry level smartphones called Azra, Bysi, Cxqi, and Dipq in a country. Details about their market share, unit selling price, and profitability (defined as the profit as a percentage of the revenue) for the year 2016 are given in the table below:

Brand	Market Share (%)	Unit Selling Price (Rs.)	Profitability (%)
Azra	40	15,000	10
Bysi	25	20,000	30
Cxqi	15	30,000	40
Dipq	20	25,000	30

In 2017, sales volume of entry level smartphones grew by 40% as compared to that in 2016. Cxqi offered a 40% discount on its unit selling price in 2017, which resulted in a 15% increase in its market share. Each of the other three brands lost 5% market share. However, the profitability of Cxqi came down to half of its value in 2016. The unit selling prices of the other three brands and their profitability values remained the same in 2017 as they were in 2016

The brand that had the highest revenue in 2016 is:
A. Cxqi
B. Bysi

C. Azra
D. Dipq

Answer ||| C
Solution |||
Let '100a' be the number of smartphones sold in 2016.
Total revenue generated by Azra = 40a * 15000 = Rs. 600000a
Total revenue generated by Bysi = 25a * 20000 = Rs. 500000a
Total revenue generated by Cxqi = 15a * 30000 = Rs. 450000a
Total revenue generated by Dipq = 20a * 25000 = Rs. 500000a
We can see that revenue generated by Azra is the highest among all four brands.
Hence, option C is the correct answer.
30.The brand that had the highest profit in 2016 is:
A. Bysi
B. Dipq
C. Cxqi
D. Azra

Answer ||| C
Solution |||
Let '100a' be the number of smartphones sold in 2016.
Total revenue generated by Azra = 40a * 15000 = Rs. 600000a
Profitability is defined as the profit as a percentage of the revenue. Therefore, profit generated by Azra = $\frac{10}{100}$ * 600000a = Rs. 60000a
Total revenue generated by Bysi = 25a * 20000 = Rs. 500000a
Profit generated by Bysi = $\frac{30}{100}$ * 500000a = Rs. 150000a
Total revenue generated by Cxqi = 15a * 30000 = Rs. 450000a
Profit generated by Cxqi = $\frac{40}{100}$ * 450000a = Rs. 180000a
Total revenue generated by Dipq = 20a * 25000 = Rs. 500000a
Profit generated by Dipq = $\frac{30}{100}$ * 500000a = Rs. 150000a
We can see that profit generated by Cxqi is the highest among all four brands. Hence, option C is the correct answer.
31.The brand that had the highest profit in 2017 is:
A. Bysi
B. Azra
C. Cxqi
D. Dipq

Answer ||| A
Solution |||

Let '100a' be the number of smartphones sold in 2016. Then the number of smartphones sold in 2017 = 1.4*100a = 140a
It is given that Cxqi offered a 40% discount on its unit selling price in 2017 i.e., selling price in 2017 = 0.6*30000 = Rs. 18000
Also Cxqi's merket share increased by 15% whereas the other three brands lost 5% market share.

Brand	Maket Share (%)	No of units	Unit Selling Price (Rs.)	Profitibility(%)
Azra	35	49x	15,000	10
Bysi	20	28x	20,000	30
Cxqi	30	42x	18,000	20
Dipq	15	21x	25,000	30

Amount of profit generated by Azra = $\frac{10}{100}$ * 15000 * 49a = 73500a
Amount of profit generated by Bysi = $\frac{30}{100}$ * 20000 * 28a = 168000a
Amount of profit generated by Cxqi = $\frac{20}{100}$ * 18000 * 42a = 151200a
Amount of profit generated by Dipq = $\frac{30}{100}$ * 25000 * 21a = 157500a
We can see that brand Bysi generated maximum profit in 2017. Hence, option A is the correct answer.

32.The complete list of brands whose profits went up in 2017 from 2016 is:
A. Azra, Bysi, Dipq
B. Cxqi, Azra, Dipq
C. Azra, Bysi, Cxqi
D. Bysi, Cxqi, Dipq

Answer ||| A
Solution |||
Let '100a' be the number of smartphones sold in 2016.
Total revenue generated by Azra = 40a * 15000 = Rs. 600000a
Profitability is defined as the profit as a percentage of the revenue. Therefore, profit generated by Azra = $\frac{10}{100}$ * 600000a = Rs. 60000a
Total revenue generated by Bysi = 25a * 20000 = Rs. 500000a
Profit generated by Bysi = $\frac{30}{100}$ * 500000a = Rs. 150000a
Total revenue generated by Cxqi = 15a * 30000 = Rs. 450000a
Profit generated by Cxqi = $\frac{40}{100}$ * 450000a = Rs. 180000a
Total revenue generated by Dipq = 20a * 25000 = Rs. 500000a
Profit generated by Dipq = $\frac{30}{100}$ * 500000a = Rs. 150000a

It is given that the market sales increased by 40%. Hence, the number of smartphones sold in 2017 = 140% * 100a = 140a
It is given that Cxqi offered a 40% discount on its unit selling price in 2017 i.e., selling price in 2017 = 60% * 30000 = Rs. 18000
Also, Cxqi's merket share increased by 15% whereas the other three brands lost 5% market share.

Brand	Maket Share (%)	No of units	Unit Selling Price (Rs.)	Profitibility(%)
Azra	35	49x	15,000	10
Bysi	20	28x	20,000	30
Cxqi	30	42x	18,000	20
Dipq	15	21x	25,000	30

Amount of profit generated by Azra = $\frac{10}{100}$ * 15000 * 49a = 73500a

Amount of profit generated by Bysi = $\frac{30}{100}$ * 20000 * 28a = 168000a

Amount of profit generated by Cxqi = $\frac{20}{100}$ * 18000 * 42a = 151200a

Amount of profit generated by Dipq = $\frac{30}{100}$ * 25000 * 21a = 157500a

We can see that profit of brands Azra, Bysi and Dipq increased in the year 2017 as compared to 2016. Hence, option A is the correct answer.

SLOT-2 QA

1. Points A, P, Q and B lie on the same line such that P, Q and B are respectively, 100 km, 200 km and 300 km away from A. Cars 1 and 2 leave A at the same time and move towards B. Simultaneously, car 3 leaves B and moves towards A. Car 3 meets Car 1 at Q, and Car 2 at P. If each car is moving in uniform speed then the ratio of the speed of Car 2 to that of Car 1 is

A. 1 : 4
B. 2 : 9
C. 1 : 2
D. 2 : 7

Answer: A

Solution:

As the cars 1 and 3 meet at Q, we can say that by the time car 1 covers 200 km, car 3 covers 100 km.
So, the speed of car 1 is double of that of car 3……(1)
Similarly, as cars 2 and 3 meet at P, we can say that by the time car 2 covers 100 km, car 3 covers 200 km.
So, here, speed of car 3 is double that of car 1……..(2)
So, combining (1) and (2), we can get,
The speed of car 1 is 4 times that of car 2.
So, the required ratio is 1:4.
Hence, option (A) is the correct answer.

2. Let $a_1, a_2, \ldots, a_{52}$ be positive integers such that $a_1 < a_2 < \ldots < a_{52}$. Suppose their arithmetic mean is one less than the arithmetic mean of $a_2, a_3, \ldots, a_{52}$. If $a_{52} = 100$, then the largest possible value of a_1 is

A. 48
B. 20
C. 45
D. 24

Answer: D

Solution:

Arithmetic mean of the entire set of numbers = A (let)
So, arithmetic mean of $a_2, a_3, \ldots a_{52} = A+1$
So, $52A = a_1 + a_2 + \cdots + a_{52} = a_1 + a_2 + \cdots + a_{51} + 100$……(1)
On the other hand, $51(A+1) = a_2 + \cdots + a_{52} = a_2 + \cdots + a_{51} + 100$……..(2)
Substituting this value in (1), we will get, $52A = a_1 + 51(A+1)$
$A = a_1 + 51$……..(3)
Now, A will be maximum if the values $a_1, a_2, \ldots$ are consecutive integers.
So, the average will be the average of the first and the last term, that is, 50 and 100 respectively.
So, the maximum value of A will be 75.
So, maximum value of a1 = 75 – 51 = 24
Hence, option (D) is the correct answer.

3. There are two drums, each containing a mixture of paints A and B. In drum 1, A and B are in the ratio 18 : 7. The mixtures from drums 1 and 2 are mixed in the ratio 3 : 4 and in this final mixture, A and B are in the ratio 13 : 7. In drum 2, then A and B were in the ratio

A. 251 : 163
B. 239 : 161
C. 220 : 149
D. 229 : 141

Answer: B

Solution:

Let the amount of A and B in drum 2 are in the ratio a:b,

The amount of A and B from drum 1 is $\frac{18}{25}$ and $\frac{7}{25}$.

Also, the amount of mixtures from drum 1 and 2 are taken in the ratio of 3:4

So, we have $\frac{\frac{18}{25}\times\frac{3}{7}+\frac{a}{a+b}\times\frac{4}{7}}{\frac{7}{25}\times\frac{3}{7}+\frac{b}{a+b}\times\frac{4}{7}} = \frac{13}{7}$

$$\Rightarrow \frac{54(a+b)+4a(25)}{21(a+b)+4b(25)} = \frac{13}{7}$$

$$\Rightarrow 7(154a+54b) = 13(21a+121b)$$

$$\Rightarrow 1078a+378b = 273a+1573b$$

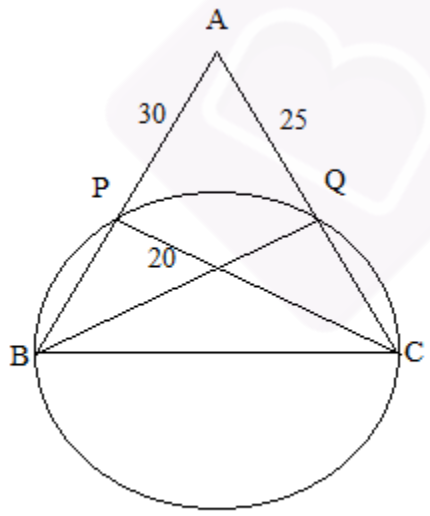
$$\Rightarrow 805a = 1195b \Rightarrow a:b = 239:161$$

Hence, option (B) is the correct answer.

4. On a triangle ABC, a circle with diameter BC is drawn, intersecting AB and AC at points P and Q, respectively. If the lengths of AB, AC, and CP are 30 cm, 25 cm, and 20 cm respectively, then the length of BQ, in cm, is

Answer: 24

Solution:

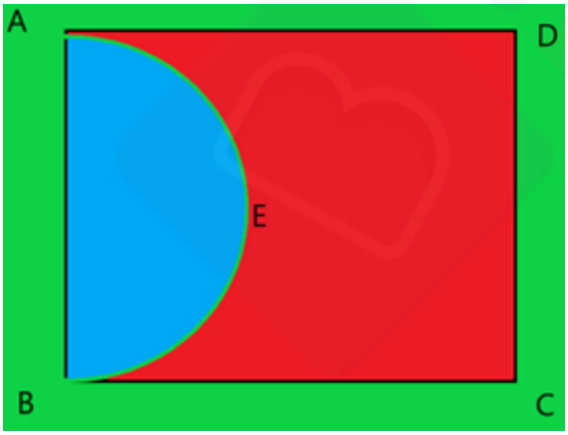


Since BC is the diameter of the circle, ∠BPC and ∠BQC are semi-circular angles and equal to 90°.

In the ΔABC, the area = ½ x Base x Height
Since AB and AC are both bases and PC and BQ are both heights of the same triangle.
$1/2\times AB\times PC = 1/2\times AC\times BQ$
$1/2\times 30\times 20 = 1/2\times 25\times BQ$
$BQ= (30\times 20)/25$
$BQ=24$
Hence the length of BQ is 24cm.

5. Let t_1, t_2,… be real numbers such that $t_1+ t_2 +... + t_n = 2n^2 + 9n + 13$, for every positive integer $n \geq 2$. If $t_k=103$, then k equals
Answer: 24
Solution:
Given, $t_1+ t_2 +... + t_n = 2n^2 + 9n + 13$…….(1)
Let n = k, then $t_1+ t_2 +... + t_k = 2k^2 + 9k + 13$ ……..(2)
Similarly, substituting n = (k-1),
we get, $t_1+ t_2 +... + t_{(k-1)} = 2(k-1)^2 + 9(k-1) + 13$… (3)
(2) – (3) will give us $t_k = 2(k^2 – (k – 1)^2)+9 = 2(2k-1) + 9= 4k + 7 = 103$ (given)
So, k = 24
Hence, 24 is the correct answer.

6. From a rectangle ABCD of area 768 sq. cm, a semi-circular part with diameter AB and area 72π sq. cm is removed. The perimeter of the leftover portion, in cm, is
A. 88 + 12π
B. 80 + 16π
C. 86 + 8π
D. 82 + 24π
Answer: D
Solution:



Let, the radius of the semi-circular area be r cm.
So, $1/2\times\pi r^2=72\pi$ and r = 12
Then, AB= diameter = 2r = 24 cm and AD=BC=y
And 24y = 768, y = 32
Now, for the semi-circular part AEB, the length = half of the perimeter of the total circle = $1/2\times 2\pi r=\pi\times 12=12\pi$
Now, BC+CD+AD=32+24+32=88
So, the total perimeter is 88+12π.

So, option D is the correct answer.

7. If N and x are positive integers such that $N^N = 2^{160}$, and $N^2 + 2^N$ is an integral multiple of 2^x, then the largest possible x is
Answer: 10
Solution:
Since $N^N = 2^{160}$
$N^N=2^{5x32}=(2^5)^{32}=32^{32}$
$N = 32$
Now, $N^2+2^N=32^2+2^{32}=2^{10}+2^{32}=2^{10}(1+2^{22})$=divisible by 2^x
Hence, the maximum value of x will be 10.
Hence, 10 is the correct answer.

8. A chord of length 5 cm subtends an angle of 60° at the centre of a circle. The length, in cm, of a chord that subtends an angle of 120° at the centre of the same circle is
A. 2π
B. 5√3
C. 6√2
D. 8
Answer: B
Solution:

The chord AB subtends an angle 60° at the centre O.
Since OA and OB are two radii of the circle hence, ∠OAB = ∠OBA = 60°.
Hence, ΔOAB is an equilateral triangle and OA = OB = AB = 5cm.
The chord CD subtends an angle of 120° at the centre O.
Similarly, ΔOCD is an isosceles triangle in which OC = OD = 5cm (As they are the radii of the same circle).
Hence ∠OCD = ∠ODC = (180 - 120)/2 = 30°
Now in ΔOCD, by the sine rule,
$OC/(\sin 30)=CD/(\sin 120)$
$5/(1/2)=CD/(\sqrt{3}/2)$
$CD=5\sqrt{3}$
Hence the length of the required chord = $5\sqrt{3}$ cm
Hence, option (B) is the correct answer.

9. If $p^3 = q^4 = r^5 = s^6$, then the value of $\log_s(pqr)$ is equal to
A. 24/5
B. 1
C. 47/10
D. 16/5
Answer: C
Solution:
$p^3 = q^4 = r^5 = s^6=k^{60}$, where K is a non-zero constant.
so, $p = k^{20}$
$q = k^{15}$

$r = k^{12}$
$s = k^{10}$
So, $\log_s (pqr) = log_{k^{10}}(k^{20} \times k^{15} \times k^{12}) = \frac{47}{10}$
Hence, option (C) is the correct answer.

10. In a tournament, there are 43 junior level and 51 senior level participants. Each pair of juniors play one match. Each pair of seniors play one match. There is no junior versus senior match. The number of girl versus girl matches in junior level is 153, while the number of boy versus boy matches in senior level is 276. The number of matches a boy plays against a girl is

Answer: 1098
Solution:
The number of girl versus girl matches in junior level is 153.
Let, the number of girls in the junior level be "g".
So, ${}^{g}C_2=153$
$g(g-1)/2=153$
$g(g-1)=306$ or $g=18$, number of boys in junior level = b = 43 -18 = 25
While the number of boy versus boy matches in senior level is 276.
Let, the number of boys be B
So, ${}^{B}C_2=276$
$B(B-1)/2=276$
$B(B – 1) = 552$ or $B= 24$, number of girls in senior level = G = 51 - 24 = 27
So, number of boy vs girl match in junior level = 18 x 25=450
And the number of boy vs girl match in senior level = 27x24=648
So, the total = 450+648=1098.
Hence, 1098 is the correct answer.

11. A 20% ethanol solution is mixed with another ethanol solution, say, S of unknown concentration in the proportion 1:3 by volume. This mixture is then mixed with an equal volume of 20% ethanol solution. If the resultant mixture is a 31.25% ethanol solution, then the unknown concentration of S is
A. 50%
B. 55%
C. 48%
D. 52%

Answer: A
Solution:
Let, the unknown concentration be C%
Let us take 100 units of the first solution and 300 units of the second solution.
So, total ethanol =(20+3C) in (100+300)=400 units
Now, we have taken 400 units of another 20% solution.
So, total ethanol = (20+3C+80) units in (400+400)=800 units
So, final percentage of ethanol = (100+3C)/800 =31.25%
100+3C=250

3C=150
C= 50
Hence, option (A) is the correct answer.

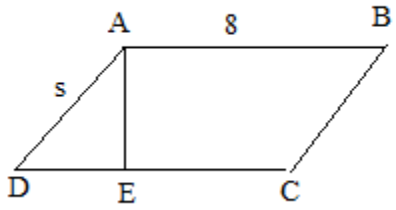
12. The area of a rectangle and the square of its perimeter are in the ratio 1 : 25. Then the lengths of the shorter and longer sides of the rectangle are in the ratio
3 : 8
2 : 9
1 : 4
1 : 3
Answer: C
Solution:
Let, the length, or the longer side of the rectangle be L units and the breadth, or the shorter side of that rectangle be B units.
So, Area = LB and Perimeter = 2(L+B)
So, LB : $4(L+B)^2=1:25$
$LB/(4(L+B)^2)=1/25$
$25LB = 4L^2+8LB+4B^2$
$4L^2 - 17\ LB + 4B^2 = 0$
$4L^2 - LB - 16LB + 4B^2=0$
$L\ (4L - B) - 4B(4L - B) = 0$
$(4L - B)(L - 4B) = 0$
$L = B/4$ or $4B$
L:B= 1:4 or 4:1
Since L is longer, the correct solution will be 4:1.
So, shorter : longer = 1:4
Hence, option (C) is the correct answer.

13. The smallest integer n for which $4^n > 17^{19}$ holds, is closest to
A. 33
B. 39
C. 37
D. 35
Answer: B
Solution:
Given that,
$4^n>17^{19} > 16^{19}=4^{38}$
So, n>38
From the option, only 39 satisfies the given condition.
Hence, option (B) is the correct answer.

14. The smallest integer n such that $n^3 - 11n^2 + 32n - 28 > 0$ is
Answer: 8
Solution:
$n^3 - 11n^2 + 32n - 28 > 0$
Factorising $n^3 - 11n^2 + 32n - 28$, we have
$n^3 - 11n^2 + 32n - 28 = (n-2)(n^2 - 9n + 14) = (n-2)^2(n-7)$
So, $(n-2)^2\,(n-7)> 0$

Since the square term is always positive,
to make the above inequality correct, n – 7 must be positive.
So the smallest integer for n is 8.
Hence, 8 is the correct answer.

15. A parallelogram ABCD has area 48 sqcm. If the length of CD is 8 cm and that of AD is 's' cm, then which one of the following is necessarily true?
A. $s \geq 6$
B. $s \neq 6$
C. $5 \leq s \leq 7$
D. $s \leq 6$
Answer:
Solution:



Let AE is perpendicular on CD.
So, the area of the parallelogram = CD x AE = 48
8 x AE = 48
AE = 6
In right-angled triangle ADE, AD is the hypotenuse, so, AD>AE
If the parallelogram ABCD becomes a rectangle, then AD = AE
Now, $AD \geq AE = 6$ or $s \geq 6$.
Hence, option (C) is the correct answer.

16. The value of the sum 7 x 11 + 11 x 15 + 15 x 19 + ... + 95 x 99 is
A. 80707
B. 80751
C. 80730
D. 80773
Answer: A
Solution:
The n-th term = $(4n+3)(4n+7) = 16n^2 + 40n + 21$
So, sum will be $16(1^2+2^2+\ldots+n^2) + 40\,(1+2+..+n) + 21n$
$= 16n(n+1)(2n+1)/6 + 40n(n+1)/2 + 21n$
$= 8n(n+1)(2n+1)/3 + 20n(n+1) + 21n$
$= 4/3\ n(n+1)(4n+2+15) + 21n$
$= 4/3\ n(n+1)(4n+17)+21n$
Now, the last term given is $95x99 = (4n+3)(4n+7)$
$4n+3 = 95$ $4n = 92$ $n = 23$

So, the sum of the given series = 4/3 [23(23+1)(4×23+17)]+21×23=80707.
Hence, option (A) is the correct answer.

17. On a long stretch of east-west road, A and B are two points such that B is 350 km west of A. One car starts from A and another from B at the same time. If they move towards each other, then they meet after 1 hour. If they both move towards the east, then they meet in 7 hrs. The difference between their speeds, in km per hour, is
Answer: 50
Solution:
Let their respective speeds be a km/h and b km/h, respectively.
When they are moving in the same direction, their relative speed will be the difference between their respective speeds, that is, (a – b) km/h.
Here, as they move towards east and meet, the speed of the car towards west must be greater than that of the car towards east.
Otherwise, they can never meet.
So, 7(a – b) = 350……..(2)
(a – b) = 50 ……(3)
Hence, 50 is the correct answer.

18. If the sum of squares of two numbers is 97, then which one of the following cannot be their product?
A. 64
B. -32
C. 16
D. 48
Answer: A
Solution:
Let, the two numbers be a and b.
So, $a^2+b^2 = 97$
Now, $(a – b)^2$ must be non-negative.
So, $a^2+b^2 – 2ab \geq 0$
$97 – 2ab \geq 0$
$48.5 \geq ab$
So, the product can never exceed 48.5.
Hence, option A is the correct answer.

19. A jar contains a mixture of 175 ml water and 700 ml alcohol. Gopal takes out 10% of the mixture and substitutes it by water of the same amount. The process is repeated once again. The percentage of water in the mixture is now
A. 25.4
B. 20.5
C. 30.3
D. 35.2
Answer: D

Solution:
Let the formula be, $F = I(1-R/T)^N$.
Where, I is the initial percentage of alcohol,
T is the total volume of the liquid,
F is the final percentage of alcohol,
R is the amount of alcohol taken out every time,
And N is the number of times the procedure is repeated.

Here, F = unknown
I = 700/875
T = 875
R = 87.5
So, we will get,
$F=I(1 - R/T)^N = 700/875\ (1 - 87.5/875)^2 = 700/875 \times 81/100 = 567/875$
So finally, there will be 567 ml of alcohol.
So, finally the volume of water will be 875 – 567 = 308 ml
So, percentage of water will be $(308/875) \times 100\% = 35.2$
Hence, option (D) is the correct answer.

20. Points A and B are 150 km apart. Cars 1 and 2 travel from A to B, but car 2 starts from A when car 1 is already 20 km away from A. Each car travels at a speed of 100 kmph for the first 50 km, at 50 kmph for the next 50 km, and at 25 kmph for the last 50 km. The distance, in km, between car 2 and B when car 1 reaches B is
Answer: 5
Solution:
The total time taken by car A = $\frac{50}{100} + \frac{50}{50} + \frac{50}{25}$ = 3 hours 30 minutes.
Car A covered the first 20 km in 1/5 hour or 12 minutes.
So, car B gets 12 minutes less.
As the second car gets 12 minutes less,
when the first car reaches the finishing line, the second car will be 12 minutes behind.
In those 12 minutes or 1/5 hours, he will cover 5 km.
Hence, option (D) is the correct answer.

21. A tank is emptied every day at a fixed time point. Immediately thereafter, either pump A or pump B or both start working until the tank is full. On Monday, A alone completed filling the tank at 8 pm. On Tuesday, B alone completed filling the tank at 6 pm. On Wednesday, A alone worked till 5 pm, and then B worked alone from 5 pm to 7 pm, to fill the tank. At what time was the tank filled on Thursday if both pumps were used simultaneously all along?
A. 4 : 12 PM
B. 4 : 24 PM
C. 4 : 48 PM
D. 4 : 36 PM
Answer: B
Solution:

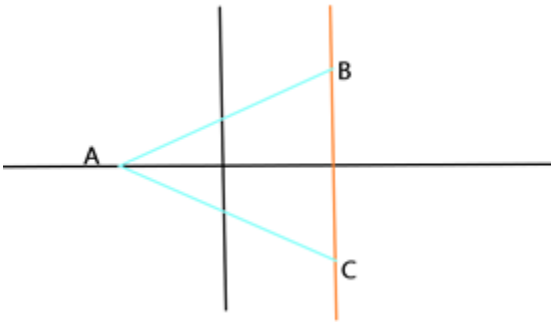
Let, pump A can fill "a" litre of water into the tank in 1 hour.
And pump B can fill "b" litre of water into the tank in 1 hour.
So, we can see that A takes 2 hours more than B to fill the tank.
Let B take T hours.
So, A takes (T+2) hours.
So, the total capacity of the tank = C(let) = Tb = (T+2)a
On Wednesday, B worked for 2 hours only. So, it filled 2b litres.
The remaining (Ta – 2b) litres are filled by A in (T+2 – 3)hours = (T – 1) hours
So, (T – 1) a + 2b = C
Ta – a + 2b = C
Ta – a + 2b = C = Tb
Ta – a +2b = Tb
Ta +2b = Tb + a……(1)
Similarly, we can get, Ta – a + 2b = (T+2)a
Ta – a + 2b = Ta +2a
3a = 2b = 6k(let)
So, a = 2k and b = 3k……(2)
Total capacity = 3Tk = 2(T+2)k
Solving, T = 4
A takes 6 hours and B takes 4 hours to fill the tank while working independently.
Capacity of the tank = 12k or starting time = 2 pm
Time taken to fill if the pumps work together = 12k /(2k+3k) = 2.4 hours
Filling time = 4:24 pm.

22. Ramesh and Ganesh can together complete a work in 16 days. After seven days of working together, Ramesh got sick, and his efficiency fell by 30%. As a result, they completed the work in 17 days instead of 16 days. If Ganesh had worked alone after Ramesh got sick, in how many days would he have completed the remaining work?
A. 12
B. 14.5
C. 13.5
D. 11
Answer: C
Solution:
Let Ramesh do R work in a day and Ganesh can do G work in a day.
Together they will do (R+G) work.
So, the total work = 16(R+G)=T (let)……..(1)
In 7 days, work done = 7(R+G)
So, remaining work = 9(R+G)
Then the efficiency of R becomes 0.7R.
Remaining number of days = 17 – 7 = 10
So, 10(0.7R+G)=9(R+G)
7R+10G=9R+9G or G=2R
Substituting the value in (1), we get,
T=16(3R)=48R
So, remaining work=27R
That G can do in 27R/2R=13.5 days.
Hence, option (C) is the correct answer.

23. If a and b are integers such that $2x^2 - ax + 2 > 0$ and $x^2 - bx + 8 \geq 0$ for all real numbers x, then the largest possible value of 2a − 6b is
Answer: 36
Solution:
$Ax^2+Bx+C=E$ (let)
AE<0 if x lies between the two different real roots of the equation E=0
Since $2x^2 - ax + 2 > 0$ and $x^2 - bx + 8 \geq 0$ for all real numbers x,
We can infer that the equations $2x^2 - ax + 2 = 0$ and $x^2 - bx + 8 = 0$ has no real root
So, both the equations have negative discriminant.
So, from the first equation, we get, $a^2 - 16 < 0$ or $(-4) < a < 4$ .....(1)
Since a is an integer, values a can take are (-3), (-2), …2, 3
On the other hand, from the second equation, we will get,
$(-4\sqrt{2})<b<4\sqrt{2}$.... (2)
Since b is an integer, max value = 5, min value = -5
Now, 2a − 6b = 2(3) − 6(-5) = 6+30 = 36.
Hence, 36 is the correct answer.

24. The scores of Amal and Bimal in an examination are in the ratio 11 : 14. After an appeal, their scores increase by the same amount and their new scores are in the ratio 47 : 56. The ratio of Bimal's new score to that of his original score is
A. 3 : 2
B. 4 : 3
C. 5 : 4
D. 8 : 5
Answer: B
Solution:
Let the old scores of Amal and Bimal be 11x and 14x, respectively.
After the appeal, let their marks be increased by m.
Thus, we can write the following:
(11x + m)/(14x + m)=47/56
616x+56m=658x+47m
9m = 42x
m=14x/3
Thus, Bimal's new score becomes = 14x + 14x/3=56x/3
And the required ratio is (56x/3)/14x = 4/3.
Hence, option (B) is the correct answer.

25. A triangle ABC has area 32 sq. units and its side BC, of length 8 units, lies on the line x = 4. Then the shortest possible distance between A and the point (0,0) is
A. $4\sqrt{2}$ units
B. $2\sqrt{2}$ units
C. 4 units
D. 8 units
Answer: C
Solution:



In the above diagram, the black lines signify the coordinate axes
The red line signifies the straight-line x = 4, which is parallel to the Y axis and is 4 units towards the right of the Y axis
BC = base of the triangle = 8 units
Since, the area of the triangle is 32 square units,
½ x H x 8 = 32
So, we will get, H = 8 units
Now, to get A as close as possible to the origin, that is, (0,0), we need to take the X-axis as the height of the triangle ABC.
Also, consider ABC is isosceles where AB = AC
So, A will be 8 units away from the side BC
So, A will be at the point (-4,0)
So, A will be 4 units away from the origin.
Hence, option (C) is the correct answer.

26. How many two-digit numbers, with a non-zero digit in the unit's place, are there which are more than thrice the number formed by interchanging the positions of its digits?
A. 5
B. 8
C. 7
D. 6
Answer: D
Solution:
Let, the digit at unit's place be U (≠0) and the digit at ten's place be T.
So, the number is 10T+U and the reversed number will be 10U+T.
So, 10T+U > 3(10U+T)
10T + U > 30U + 3T
7T > 29U
T > 29/7 U or T> 4U
So, the possible pairs of (T,U) are (5,1) (6,1) (7,1) (8,1) (9,1) and (9,2).
Hence, option (D) is the answer.

27. A water tank has inlets of two types A and B. All inlets of type A when open, bring in water at the same rate. All inlets of type B, when open, bring in water at the same rate. The empty tank is completely filled in 30 minutes if 10 inlets of type A and 45 inlets of type B are open, and in 1 hour if 8 inlets of type A and 18 inlets of type B

are open. In how many minutes will the empty tank get completely filled if 7 inlets of type A and 27 inlets of type B are open?

Answer: 48
Solution:
Let, each inlet of type A fills 'a' units of water.
And each inlet of type B fills 'b' units of water.
Also let the time taken in the third case to fill the tank be 'm' minutes.
So, 30(10a+45b)=60(8a+18b)=m(7a+27b) = total capacity of the water tank
150(2a+9b)=120(4a+9b)=m(7a+27b)=T (let)
150(2a+9b)=120(4a+9b)
5(2a+9b)=4(4a+9b)
10a+45b=16a+36b
9b = 6a or 3b=2a=6k(let), Where k is a non-zero constant.
b=2k and a = 3k
So, substituting this value in the initial equation, we will get,
30(10a+45b)=60(8a+18b)=m(7a+27b)
30(30k+90k)=60(24k+36k)=m(75k)
30(120k)=60(60k)=75mk or m = 48.
Hence, 48 is the correct answer.

28. Gopal borrows Rs. X from Ankit at 8% annual interest. He then adds Rs. Y of his own money and lends Rs. X+Y to Ishan at 10% annual interest. At the end of the year, after returning Ankit's dues, the net interest retained by Gopal is the same as that accrued to Ankit. On the other hand, Gopal lent Rs. X+2Y to Ishan at 10%, then the net interest retained by him would have increased by Rs. 150. If all interests are compounded annually, then find the value of X + Y.
Answer: 4000
Solution:
Let, X and Y be Rs. 100a and Rs. 100b respectively.
Since Gopal had borrowed Rs. 100a from Ankit, he owes 8% of Rs.100a=Rs.8a to Ankit at the end of the year.
Similarly, Gopal lends Rs. (100a + 100b) to Ishan at 10% annual interest. Hence, Ishan owes Gopal an interest of 10% of Rs.(100a+100b)=Rs.(10a+10b) at the end of the year.
Now, interest is retained by Gopal after paying Ankit.
Rs. (10a+10b-8a) = Rs. (2a+10b)
According to the question,
Interest retained by Gopal = Interest accrued by Ankit
2a+10b=8a
6a=10b
a/b=5/3 …… (i)
If Gopal had lent Rs. (X + 2Y) i.e., Rs. (100a+200b) to Ishan at 10% annual interest rate, then, Ishan would have owed to Gopal 10% of Rs.(100a+200b)=Rs.(10a+20b)
Again, interest retained by Gopal after paying to Ankit
Rs. (10a+20b-8a) = Rs. (2a+20b)
According to the question,
Interest retained by Gopal increased by Rs. 150

(2a+20b)-(2a+10b)=150
10b=150
b=15
100b=1500
Hence, from (i),
a/b=5/3
a/15=5/3
a=25
100a=2500
Thus, X + Y = 100a + 100b = 2500 + 1500 = 4000.

29. The arithmetic mean of x, y and z is 80, and that of x, y, z, u and v is 75, where u = (x+y)/2 and v = (y+z)/2. If x ≥ z, then the minimum possible value of x is
Answer: 105
Solution:
We get x + y + z = (3)(80) = 240……(1)
And x + y + z + u + v = (5)(75) = 375……(2)
(2) – (1) gives u + v = 135……(3)
Now, substituting the values of u and v,
we get (x + y)/2+(y + z)/2=135
x + 2y + z = 270……(4)
(4) – (1) gives us y = 30……(5)
Substituting this value in (4),
we get x + z = 210
As x≥z, and considering x and z to be integral,
we can say the minimum value of x is 105.
Hence, 105 is the correct answer.

30. Let f(x)=max{5x, 52- $2x^2$}, where x is any positive real number. Then the minimum possible value of f(x) is
Answer: 20
Solution:

We can form the following table:

Case	Min	Max	Eqn	Soln	f(x)
1	5x	52 – $2x^2$	5x<52 – $2x^2$	(0,4)	(20,52)
2	52 – $2x^2$	5x	5x>52 – $2x^2$	4<x	(20,inf)

Hence, 20 is the correct answer.

31. For two sets A and B, let AΔB denote the set of elements which belong to A or B but not both. If P = {1,2,3,4}, Q = {2,3,5,6,}, R = {1,3,7,8,9}, S = {2,4,9,10}, then the number of elements in (PΔQ)Δ(RΔS) is
A. 7
B. 8
C. 9
D. 6
Answer: A
Solution:
Now, RΔS ={1, 3, 7, 8, 2, 4, 10}
And PΔQ = {1,4,5,6}
So, (PΔQ) ΔRΔS) is, {2, 7, 8, 2, 10, 5, 6}
So, there are 7 elements.

32. If A = {62n - 35n - 1: n = 1,2,3,...} and B = {35(n-1) : n = 1,2,3,...} then which of the following is true?
A. Neither every member of A is in B nor every member of B is in A.
B. Every member of A is in B and at least one member of B is not in A.
C. Every member of B is in A.
D. At least one member of A is not in B.
Answer: B
Solution:
A = {62n - 35n - 1: n = 1,2,3,...} and B = {35(n-1) : n = 1,2,3,...}
For A, 62n - 35n – 1= (36)n – 35 n – 1 = (35+1)n – 35n – 1 = 35n + n35n – 1 +….+ 35n +1 - 35n – 1 = 35(35n-1+n35n-2+…+35)= multiple of 35
Now, for n = 1, the element is zero.
In B also, for n = 1, the element is zero.
In B, all elements are multiple of 35.
But, we can see that A has larger multiples of 35.
Hence, not all values of B will be in A.
Hence, option (B) is the correct answer.

33. The strength of a salt solution is p% if 100 ml of the solution contains p grams of salt. If three salt solutions A, B, C are mixed in the proportion 1 : 2 : 3, then the resulting solution has strength 20%. If instead the proportion is 3 : 2 : 1, then the resulting solution has a strength of 30%. A fourth solution, D, is produced by mixing B and C in the ratio 2 : 7. The ratio of the strength of D to that of A is
A. 3 : 10
B. 1 : 3
C. 2 : 5
D. 1 : 4
Answer: A
Solution:
Let, strength of the solutions A, B, C, and D be a, b, ,c and d respectively.
From the first condition,
(a+2b+3c)/6=20%=0.2=1/5……..(1)
From the second condition, (3a+2b+c)/6=30%=0.3=3/10……(2)

And d=(2b+7c)/9……(3)
From (1), we get, a+2b+3c = 1.2……(4) Or
5a+10b+15c=6……(4A)
From (2) we get, 3a+2b+c=1.8……..(5) Or
15a+10b+5c=9…….(5A)
From (3), we get, 9d= 2b+7c…….(6)
(4A)x3 15a+30b+45c=18……(4B)
(4B) – (5A) 20b+40c= 9……..(#)
Now, (5) – (4) gives us 2a – 2c = 0.6
a – c = 0.3
Hence, option (A) is the correct answer.

34. $1/\log_2 100 - 1/\log_4 100 + 1/\log_5 100 - 1/\log_{10} 100 + 1/\log_{20} 100 - 1/\log_{25} 100 + 1/\log_{50} 100$= ?
A. 0
B. ½
C. -4
D. 10
Answer: B
Solution:
Given that, $1/\log_2 100 - 1/\log_4 100 + 1/\log_5 100 - 1/\log_{10} 100 + 1/\log_{20} 100 - 1/\log_{25} 100 + 1/\log_{50} 100$
$= \log_{100} 2 - \log_{100} 4 + \log_{100} 5 - \log_{100} 10 + \log_{100} 20 - \log_{100} 25 + \log_{100} 50.$
$= \log_{100} \left(\frac{2}{4} \times \frac{5}{10} \times \frac{20}{25} \times 50\right) = \log_{100} 10 = ½ .$
Hence, option (B) is the correct answer.

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