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CAT 2018 Questions and Answers – Morning Slot

Contact

Verbal Ability and Reading Comprehension

"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 hyperaggression. . . .

[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."

Q.1 Which of the following measures is Bradshaw most likely to support to address the problem of elephant aggression?

1. The development of treatment programmes for elephants drawing on insights gained from treating post-traumatic stress disorder in humans.
2. Increased funding for research into the similarity of humans and other animals drawing on insights gained from human-elephant similarities.
3. Funding of more studies to better understand the impact of testosterone on male elephant aggression.
4. Studying the impact of isolating elephant calves on their early brain development, behaviour and aggression.

Q.2 In paragraph 4, the phrase, "The fabric of elephant society . . . has[s] effectively been frayed by . . ." is:

1. a metaphor for the effect of human activity on elephant communities.
2. an exaggeration aimed at bolstering Bradshaw's claims.
3. an accurate description of the condition of elephant herds today.
4. an ode to the fragility of elephant society today.

Q.3 Which of the following statements best expresses the overall argument of this passage?

1. The brain organisation and early development of elephants and humans are extremely similar.
2. The relationship between elephants and humans has changed from one of coexistence to one of hostility.
3. Recent elephant behaviour could be understood as a form of species-wide trauma-related response.
4. Elephants, like the humans they are in conflict with, are profoundly social creatures.

Q.4 In the first paragraph, Bradshaw uses the term "violence" to describe the recent change in the human-elephant relationship because, according to him:

1. there is a purposefulness in human and elephant aggression towards each other.
2. both humans and elephants have killed members of each other's species.
3. human-elephant interactions have changed their character over time.
4. elephant herds and their habitat have been systematically destroyed by humans.

Q.5 The passage makes all of the following claims EXCEPT:

1. human actions such as poaching and culling have created stressful conditions for elephant communities.
2. the elephant response to deeply disturbing experiences is similar to that of humans.
3. elephant mothers are evolving newer ways of rearing their calves to adapt to emerging threats.
4. elephants establish extended and enduring familial relationships as do humans.

Answers:

Q1: Option (1)
Q2: Option (1)
Q3: Option (3)
Q4: Option (1)
Q5: Option (3)

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 do 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. . . . [T]he 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.

Q.1 It can be inferred that the author considers the Keep America Beautiful organisation:

1. a "greenwash" because it was a benevolent attempt to improve public recycling habits.
2. an innovative example of a collaborative corporate social responsibility initiative.
3. an important step in sensitising producers to the need to tackle plastics pollution.
4. a sham as it diverted attention away from the role of corporates in plastics pollution.

Q.2 In the first paragraph, the author uses "lie" to refer to the:

1. understatement of the effects of recycling plastics.

2. understatement of the enormity of the plastics pollution problem.
3. blame assigned to consumers for indiscriminate use of plastics.
4. fact that people do not know they have been lied to.

Q.3 The author lists all of the following as negative effects of the use of plastics EXCEPT the:

1. slow pace of degradation or non-degradation of plastics in the environment.
2. air pollution caused during the process of recycling plastics.
3. adverse impacts on the digestive systems of animals exposed to plastic.
4. poisonous chemicals released into the water and food we consume.

Q.4 In the second paragraph, the phrase "what hammering a nail is to halting a falling skyscraper" means:

1. relying on emerging technologies to mitigate the ill-effects of plastic pollution.
2. encouraging the responsible production of plastics by firms.
3. focusing on single-use plastic bags to reduce the plastics footprint.
4. focusing on consumer behaviour to tackle the problem of plastics pollution.

Q.5 Which of the following interventions would the author most strongly support:

1. completely banning all single-use plastic bags.
2. recycling all plastic debris in the seabed.
3. having all consumers change their plastic consumption habits.
4. passing regulations targeted at producers that generate plastic products.

Answers:

Q1: Option (4)
Q2: Option (3)
Q3: Option (2)
Q4: Option (4)
Q5: Option (4)

[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.

Q.1 The author claims that omitting mention of Indians who served in the Second World War from the new National War Memorial is:

1. a reflection of misplaced priorities of the post-independence Indian governments.
2. is something which can be rectified in future by constructing a separate memorial.
3. a reflection of the academic and popular view of India's role in the War.
4. appropriate as their names can always be included in the India Gate memorial.

Q.2 The phrase "mood music" is used in the second paragraph to indicate that the Second World War is viewed as:

1. a part of the narrative on the ill-effects of colonial rule on India.
2. a backdrop to the subsequent independence and partition of the region.
3. setting the stage for the emergence of the India–Pakistan rivalry in the subcontinent.
4. a tragic period in terms of loss of lives and national wealth.

Q.3 The author suggests that a major reason why India has not so far acknowledged its role in the Second World War is that it:

1. blames the War for leading to the momentous partition of the country.
2. wants to forget the human and financial toll of the War on the country.
3. has been focused on building an independent, non-colonial political identity.
4. views the War as a predominantly Allied effort, with India playing only a supporting role.

Q.4 In the first paragraph, the author laments the fact that:

1. there is no recognition of the Indian soldiers who served in the Second World War.
2. India lost thousands of human lives during the Second World War.
3. funds will be wasted on another war memorial when we already have the India Gate memorial.
4. the new war memorial will be built right next to India Gate.

Q.5 The author lists all of the following as outcomes of the Second World War EXCEPT:

1. large-scale deaths in Bengal as a result of deprivation and famine.
2. independence of the subcontinent and its partition into two countries.
3. the large financial debt India owed to Britain after the War.
4. US recognition of India's strategic location and role in the War.

Answer:

Q1: Option (3)
Q2: Option (2)
Q3: Option (3)
Q4: Option (1)
Q5: Option (3)

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 acquired 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.

Q.1 Which of the following, if found to be true, would negate the main message of the passage?

1. A study highlighting the criticality of epigenetic inheritance to evolution.
2. A study affirming the influence of socio-cultural markers on evolutionary processes.
3. A study affirming the sole influence of natural selection and inheritance on evolution.
4. A study indicating the primacy of ecological impact on human adaptation.

Q.2 Which of the following options best describes the author's argument?

1. Mendel's theory of inheritance is unfairly underestimated in explaining evolution.
2. Wilson's theory of evolution is scientifically superior to either Darwin's or Mendel's.
3. Darwin's theory of natural selection cannot fully explain evolution.
4. Darwin's and Mendel's theories together best explain evolution.

Q.3 The Emory University experiment with mice points to the inheritance of:

1. acquired characteristics
2. acquired parental fears
3. psychological markers
4. personality traits

Q.4 The passage uses the metaphor of a dog walker to argue that evolutionary adaptation is most comprehensively understood as being determined by:

1. extra genetic, genetic, epigenetic and genomic legacies.
2. ecological, hormonal, extra genetic and genetic legacies.
3. socio-cultural, genetic, epigenetic, and genomic legacies
4. genetic, epigenetic, developmental factors, and ecological legacies.

Answers

Q1: Option (3)
Q2: Option (3)
Q3: Option (1)
Q4: Option (4)

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 over-arching goal.

Q.1 The author's view would be undermined by which of the following research findings?

1. Stakeholders globally are moving away from collecting data on the well-being of individuals.
2. There is a definitive move towards the adoption of wearable technology that taps into emotions.
3. A proliferation of gyms that are collecting data on customer well-being.
4. Individuals worldwide are utilising technologies to monitor and increase their well-being.

Q.2 In the author's opinion, the shift in thinking in the 1970s:

1. put people in touch with their own feelings rather than depending on psychologists.
2. was a welcome change from the earlier view that depression could be cured by changing circumstances.
3. introduced greater stress into people's lives as they were expected to be responsible for their own happiness.
4. reflected the emergence of neuroscience as the authority on human emotions.

Q.3 From the passage we can infer that the author would like economists to:

1. correlate measurements of happiness with economic indicators.
2. measure the effectiveness of Facebook and social media advertising.
3. work closely with neuroscientists to understand human behaviour.
4. incorporate psychological findings into their research cautiously.

Q.4 According to the author, Dubai:

1. is on its way to becoming one of the world's happiest cities.
2. develops sophisticated technologies to monitor its inhabitants' states of mind.
3. collaborates with Facebook to selectively influence its inhabitants' moods.
4. incentivises companies that prioritise worker welfare.

Q.5 According to the author, wearable technologies and social media are contributing most to:

1. depression as a thing of the past.
2. disciplining individuals to be happy.
3. making individuals aware of stress in their lives.
4. 4. happiness as a "personal project".

Answers

Q1: Option (1)
Q2: Option (3)
Q3: Option (4)
Q4: Option (2)
Q5: Option (2)

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 sixteenth century or the beginning of the seventeenth century.

1. The Renaissance artists were responsible for the study of landscape as a subject of art.
2. Landscape became a major subject of art at the turn of the sixteenth century.
3. The three-dimensional understanding of the organism in Europe led to a similar approach towards the understanding of landscape.
4. The study of landscape as an independent genre was aided by the Renaissance artists.

Answer:

Option(4)

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

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

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

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

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:

Option(5)

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:

Option(4)

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.

1. The professions-approach has been one of the most relied upon perspective in the study of management knowledge production.
2. Professions-approach focuses on the creation of institutions of higher education and disciplines to promote knowledge production
3. The study of knowledge production can be done through many perspectives.
4. Professions-approach aims at the institutionalization of knowledge but restricts knowledge production as a function of a select few.

Answer:

Option(4)

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:

Option(2)

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.

1. Artificial embryo twinning is low-tech and is close to the natural development of twins where the embryo splits into two identical twins.
2. Artificial embryo twinning is just like the natural development of twins, where during fertilization twins are formed.
3. Artificial embryo twinning is low-tech unlike the natural development of identical twins from the embryo after fertilization.
4. Artificial embryo twinning is low-tech and mimetic of the natural development of genetically identical twins from the embryo after fertilization.

Answer:
Option(4)

Data Interpretation and Logical Reasoning

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

An ATM dispenses exactly Rs. 5000 per withdrawal using 100, 200 and 500 rupee notes. The ATM requires every customer to give her preference for one of the three denominations of notes. It then dispenses notes such that the number of notes of the customer's preferred denomination exceeds the total number of notes of other denominations dispensed to her.

1) In how many different ways can the ATM serve a customer who gives 500 rupee notes as her

preference?

Answer: 7

Solution: As it is given that the number of notes of the customer's preferred denomination exceeds the total number of notes of other denominations dispensed to her So the following cases are possible,

Cases	No. of 500 rupee notes	No. of 200 rupee notes	No. of 100 rupee notes
1	10	0	0
2	9	2	1
3	9	1	3
4	9	0	5
5	8	5	0
6	8	4	2
7	8	3	4

So total number of required ways = 7

Answer : 7

2) **If the ATM could serve only 10 customers with a stock of fifty 500 rupee notes and a sufficient number of notes of other denominations, what is the maximum number of customers among these 10 who could have given 500 rupee notes as their preferences?**

Answer: 6

Solution**: As total number of 500 notes = 50**

From the solution of the previous question we can see if the customers could have given 500 rupee notes as their preferences minimum number

of 500 rupee notes they will need is 8 . So maximum number of who could have given 500 rupee notes as their preferences = [50/8] = 6

Answer: 6

3) **What is the maximum number of customers that the ATM can serve with a stock of fifty 500 rupee notes and a sufficient number of notes of other denominations, if all the customers are to be served with at most 20 notes per withdrawal?**

a) 13
b) 10
c) 16
d) 12
Solution: **To maximize the number of customers we need to minimize the number of 500 rupee notes per customers.**
Such that x+y+z ≤ 20——1)
and 500x+200y+100z=5000——2)
Where x = number of 500 rupee notes
y = number of 200 rupee notes
z = number of 100 rupee notes
So we need to minimize x. and from above two equations minimum value of x = 4.
Thus maximum number of customers that the ATM can serve [50/4] = 12

Answer: **d) 12**

4.) **What is the number of 500 rupee notes required to serve 50 customers with 500 rupee notes as their preferences and another 50 customers with 100 rupee notes as their preferences, if the total number of notes to be dispensed is the smallest possible?**

a) 800
b) 900
c) 1400
d) 750

Solution:

Case 1) When with 500 rupee notes is their preference , to minimize the number of notes we need to serve maximum possible 500 notes, minimum number of notes required = [5000/500] = 10
So total number of 500 notes required to to serve 50 customers = 50*10 = 500
Case 2) When with 100 rupee notes is their preference, to minimize the number of notes we need to serve maximum possible 500 notes. So
100z+500x=5000———1) and
z>x such that (z+x)isminimum .——-2)
From eq 1) & eq 2) only possible solution is x = 8 and z = 10
Thus total number of 500 notes required to to serve 50 customers = 50*8 = 400
So required number of 500 notes = case 1) + case 2) = 500 + 400 = 900

Answer: b) 900

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

A company administers a written test comprising of three sections of 20 marks each – Data Interpretation (DI), Written English (WE) and General Awareness (GA), for recruitment. A composite score for a candidate (out of 80) is calculated by doubling her marks in DI and adding it to the sum of her marks in the other two sections. Candidates who score less than 70% marks in two or more sections are disqualified. From among the rest, the four with the highest composite scores are recruited. If four or less candidates qualify, all who qualify are recruited.

Ten candidates appeared for the written test. Their marks in the test are given in the table below. Some marks in the table are missing, but the following facts are known:

1. No two candidates had the same composite score.
2. Ajay was the unique highest scorer in WE.
3. Among the four recruited, Geeta had the lowest composite score.

4. Indu was recruited.
5. Danish, Harini, and Indu had scored the same marks the in GA.
6. Indu and Jatin both scored 100% in exactly one section and Jatin's composite score was 10 more than Indu's.

Questions:

Q 1) Which of the following statements MUST be true?

1. Jatin's composite score was more than that of Danish?
2. Indu scored less than Chetna in DI?
3. Jatin scored more than Indu in GA?

a) Only 2
b) Only 1
c) Both 2 and 3
d) Both 1 and 2

Q 2) Which of the following statements MUST be FALSE?

a) Bala scored same as Jatin in DI
b) Bala's composite score was less than that of Ester
c) Chetna scored more than Bala in DI
d) Harini's composite score was less than that of Falak.

Q 3) If all the candidates except Ajay and Danish had different marks in DI, and Bala's composite score was less than Chetna's composite score, then what is the maximum marks that Bala could have scored in DI? TITA

Q 4) If all the candidates scored different marks in WE then what is the maximum marks that Harini could have scored in WE? TITA

Solution: For convenient let's consider first letter of the name of each candidate as his/her name.

From point 4) Both I and J have a full score in exactly one score and J's composite score was 10 more than I so I must score 20 in GA and J must score 20 in DI .

Thus if I's score in DI is x , then or
From point 5) score of D and H in GA = 20
From point 1) & 2) score of A in WE = 20
From point 1) & 3) G's score in WE must be 19.
Thus the following table can be obtained.

Candidate Name	Marks out of 20			Total = 2DI + WE + GA	Recruited/Disqualified
	DI	WE	GA		
A	8	**20**	16	**52**	**NR**
B	**18(or less)**	9	11	**56 (or less)**	D
C	19	4	12	**54**	**D**
D	8	15	**20**	**51**	**NR**
E	12	18	16	**58**	**R**
F	15	7	10	**47**	**D**
G	14	**19**	6	**53**	**R**
H	5		**20**		
I	**16**	8	**20**	**60**	**R**
J	**20**	16	14	**70**	**R**

Now B can not score 19 or 20 in DI as if he score 19 or 20 in DI then his composite score will be equal to as of E or I respectively , which is not possible. So B must score less than 19 in DI.

Question 1) **correct option d)**
Question 2) **option a)**
Question 3) **As C's score is 54 so B's score must be less than 54. Let B score x in DI then**
$2x+9+11<54$
$x<17$
As all candidate has different score in DI, So x can not be 16, 15 or 14 .
So maximum possible value of x = 13

Answer: 13

Question 4) **For maximum score H must score maximum in WE, which can be 17 (as all candidate have different score in WE so H can not score 20,19 or 18 as these scores have already been achieved by other candidates.**

Answer: 17

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

The multi-layered pie-chart below shows the sales of LED television sets for a big retail electronics outlet during 2016 and 2017. The outer layer shows the monthly sales during this period, with each label showing the month followed by sales figure of that month. For some months, the sales figures are not given in the chart. The middle-layer shows quarter-wise aggregate sales figures (in some cases, aggregate quarter-wise sales numbers are not given next to the quarter). The innermost layer shows annual sales. It is known that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression, as do the three monthly sales figures in the fourth quarter (October, November, December) of that year.

Questions

Q 1. What is the percentage increase in sales in December 2017 as compared to the sales in December 2016?
a) 38.46
b) 22.22
c) 50.00
d) 28.57

Q 2. In which quarter of 2017 was the percentage increase in sales from the same quarter of 2016 the highest?
a) Q4
b) Q1
c) Q2

d) Q3

Q 3. During which quarter was the percentage decrease in sales from the previous quarter's sales the highest?
a) Q2 of 2016
b) Q2 of 2017
c) Q4 of 2017
d) Q1 of 2017

Q 4. During which month was the percentage increase in sales from the previous month's sales the highest?
a) October of 2017
b) October of 2016
c) March of 2016
d) March of 2017

Solutions:

The information given in pie –chart can be represented in table form as following :

	Month/sales figure in	2016	2017
	January	80	120
Q1	February	60	100
	March	100	160
	April	40	60
Q2	May		75
	June		65
	July	75	60
Q3	August	120	
	September	55	70
	October	100	150
Q4	November		170

December

Now as given Sales figure in 2017 Q4 = 500
So sales figure in December 2017 = 500 – 150 – 170 = 180
Total sales in 2017 Q3 = 220
So sales in August 2017 = 220 – 60 – 70 = 90
Similarly sales in missing month of 2016 can be obtained as sales in the three months of 2016
Q4 & Q2 are in Arithmetic Progression. Thus following table can be obtained –

	Month/year	2016		2017	
	January	80		120	
Q1	February	60	240	100	380
	March	100		160	
	April	40		60	
	May	**50**	150	75	200
Q2	June	**60**		65	
	July	75		60	
Q3	August	120	250	**90**	220
	September	55		70	
	October	100		150	
Q4	November	**120**	300	170	500
	December	**140**		**180**	

Question 1**) required percentage increase = (180 – 140)/140×100 =40/140×100=28.57%**
Correct option d) 28.57 %
Question 2**) it can be seen that the required percentage increase in sales is highest for Q4 and this is = ((500-300))/300×100=66.66%**
Correct option a) Q4
Question 3**) From the table obtained , we can see there is decrease only in**

Q2 of both year
Decrease in Q2- 2016 = (240-150)/240×100=37.5%
Decrease in Q2- 2017 = (380-200)/380×100=47.37%
Correct option b) Q2 of 2017
Question 4**) As given options are only for may and October and we can see that sales in October 2017 is more than double (from 70 in November to 150 in October) so it is highest than other given month .**
Correct option a) October 2017

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

1600 satellites were sent up by a country for several purposes. The purposes are classified as broadcasting (B), communication (C), surveillance (S), and others (O). A satellite can serve multiple purposes; however a satellite serving either B, or C, or S does not serve O.

The following facts are known about the satellites:

1. The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1.
2. The number of satellites serving all three of B, C, and S is 100.
3. The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B.
4. The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

1) What best can be said about the number of satellites serving C?
a) Must be between 450 and 725
b) Must be at least 100
c) Cannot be more than 800
d) Must be between 400 and 800

2) What is the minimum possible number of satellites serving B exclusively?
a) 500
b) 100
c) 200
d) 250

3) If at least 100 of the 1600 satellites were serving O, what can be said about the number of satellites serving S?
a) No conclusion is possible based on the given information
b) Exactly 475
c) At most 475
d) At least 475

4) If the number of satellites serving at least two among B, C, and S is 1200, which of the following MUST be FALSE?
a) All 1600 satellites serve B or C or S
b) The number of satellites serving B is more than 1000
c) The number of satellites serving C cannot be uniquely determined
d) The number of satellites serving B exclusively is exactly 250

Solution:

It is given that the satellites serving either B, C or S do not serve O.
From point (1), let the number of satellites serving B, C and S be 2K, K, K respectively.
Let the number of satellites exclusively serving B be x.
From point (3), the number of satellites exclusively serving C and exclusively serving S will each be 0.3x
From point (4), the number of satellites serving O is same as the number of satellites serving only C and S. Let that number be y.
Since the number of satellites serving C is same as the number of satellites serving S, we can say that (number of satellites serving only B and C) + 0.3x + 100 + y = (number of satellites serving only B and S) + 0.3x + 100 + y
Let the number of satellites serving only B and C = the number of satellites serving only B and S = Z
Therefore, the venn diagram will be as follows:

Given that there are a total of 1600 satellites So
$x + z + 0.3x + z + 100 + y + 0.3x + y = 1600$
$1.6x + 2y + 2z = 1500$————————(1)

Also K = 0.3x + z + y +100
Satellites serving B = 2K = x + 2z + 100
Or 2(0.3x + z + y + 100)= x + 2z + 100
0.4x = 2y + 100
x = 5y + 250 ——————————-(2)
Substituting (2) in (1), we will get
1.6 (5y + 250)+ 2y + 2z = 1500
10y + 2z = 1100
z= 550 – 5y ————— (3)
1) The number of satellites serving C = z + 0.3x + 100 + y = (550 – 5y) + 0.3(5y + 250) + 100 + y = 725 – 2.5y This number will be maximum when y is minimum. Minimum value of y is 0. So the maximum number of satellites serving C will be 725.
From equation 3), z = 550 – 5y, Since the number of satellites cannot be negative
$z \geq 0$
or $550 – 5y \geq 0$
$y \leq 110$.
Maximum value of y is 110.
When y = 110, the number of satellites serving C will be $725 – 2.5 \times 110 = 450$.
This will be the minimum number of satellites serving C. The number of satellites serving C must be between 450 and 725.
Answer: a) Must be between 450 and 725
2) From equation 2) , the number of satellites serving B exclusively is x = 5y + 250
This is minimum when y is minimum. Minimum value of y = 0. The minimum number of satellites serving B exclusively = $5 \times 0 + 250 = 250$.
Answer: d) 250
3) Given, at least 100 satellites serve O.
We can say in this case that $y \geq 100$.
So Number of satellites serving S = 0.3x + z +100 + y. = 725 – 2.5y
This is minimum when y is maximum, i.e. 110, (from eq 3)
Minimum number of satellites serving = $725 – 2.5 \times 100 = 450$.
This is maximum when y is minimum, i.e., 100 in this case.
Maximum number of satellites serving = $725 – 2.5 \times 100 = 475$
Therefore, the number of satellites serving S is at most 475
Answer: **c) at most 475**
4) The number of satellites serving at least two of B, C or S = number of satellites serving exactly two of B, C or S + Number of satellites serving all the three
= z + z + y + 100 = 2(550 – 5y) + y + 100 = 1200 – 9y.
Given that this is equal to 1200 so
1200 – 9y = 1200
Or y = 0
If y = 0, x = 5y + 250 = 250 z = 550 – 5y = 550

No. of satellites serving C = k = z + 0.3x + 100 + y = 550 + 0.3 x 250 + 100 + y = 725
No. of satellites serving B = 2k = 2 x 725 = 1450.
From the given options, we can say that the option "the number of satellites serving C cannot be uniquely determined" must be FALSE.
Answer: c) The number of satellites serving C cannot be uniquely determine

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

You are given an n×n square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Two cells are called adjacent if they touch each other horizontally, vertically or diagonally. So a cell in one of the four corners has three cells adjacent to it, and a cell in the first or last row or column which is not in the corner has five cells adjacent to it. Any other cell has eight cells adjacent to it.

1) What is the minimum number of different numerals needed to fill a 3×3 square matrix?

Answer: 4

Solution:

As per the given definition, in a the following are the cases of adjacent cells.
X_1 X_2

or
X_1
X_2

or
X_1
X_2

In all the three cases X_1 and X_2 are adjacent to each other.
As per the question n = 3 so the matrix will look like
a a

a a

As four corners are not adjacent to each other so there can be same numerals . similarly for other squares the arrangement can be as bellow

```
  b
c     c
  b
```

Thus final arrangement of minimum numerals satisfying all the conditions will be

```
a b   a
c d   c
a b   a
```

Where a,b,c and d are different numerals .
So minimum number of numerals required = 4

2) What is the minimum number of different numerals needed to fill a 5×5 square matrix?

Answer: 4

Solution:

As per the given definition, in an x n metrix the following are the cases of adjacent cells.

X_1 X_2

Or

X_1

X_2

Or

X_1

X_2

In all the three cases X_1 and X_2 are adjacent to each other.
As per the question n = 5 so the matrix will look like

```
a     a     a
a     a     a
A     a     a
```

As every alternate squares are not adjacent to each other so there can be same numerals . similarly for other squares the arrangement can be as bellow

a b a b a
c d c d c
a b a b a
c d c d c
a b a b a

Where a,b,c and d are different numerals.
So minimum number of numerals required = 4

3) Suppose you are allowed to make one mistake, that is, one pair of adjacent cells can have the same numeral. What is the minimum number of different numerals required to fill a 5×5 matrix?

a) 4
b) 9
c) 25
d) 16

Solution:

As per the solution of previous question if we don't make any mistakes , matrix will look like

a b a b a
c d c d c
a b a b a
c d c d c
a b a b a

As we can see each numerals have been used at least 4 times. So even if one mistake is allowed, then also there won't be any change in the solution given in previous question .
So minimum number of numerals required = 4

4) Suppose that all the cells adjacent to any particular cell must have different numerals. What is the minimum number of different numerals needed to fill a 5×5 square matrix?

a) 9
b) 25
c) 16
d) 4

Solution:

As per the previous two questions 5 matrix will look like

a b a b a
c d c d c
a b a b a
c d c d c
a b a b a

But in this question b can not have 2 a's or 2 d's in it's adjacent cell and it is also true for all other numerals as well. This is satisfied only when there are at least 9 numerals.

1 2 5 4 7
4 3 6 1 8
9 7 8 9 3
1 4 2 7 5
5 3 6 1 4

So minimum number of numerals required = 9

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

Adriana, Bandita, Chitra, and Daisy are four female students, and Amit, Barun, Chetan, and Deb are four male students. Each of them studies in one of three institutes – X, Y, and Z. Each student majors in one subject among Marketing, Operations, and Finance, and minors in a different one among these three subjects. The following facts are known about the eight students:

1. Three students are from X, three are from Y, and the remaining two students, both female, are from Z.
2. Both the male students from Y minor in Finance, while the female student from Y majors in Operations.
3. Only one male student majors in Operations, while three female students minor in Marketing.
4. One female and two male students major in Finance.
5. Adriana and Deb are from the same institute. Daisy and Amit are from the same institute.
6. Barun is from Y and majors in Operations. Chetan is from X and majors in Finance.
7. Daisy minors in Operations.

1) Who are the students from the institute Z?
a) Bandita and Chitra
b) Adriana and Bandita
c) Adriana and Daisy
d) Chitra and Daisy

2) Which subject does Deb minor in?
a) Cannot be determined uniquely from the given information
b) Marketing
c) Finance
d) Operations

3) Which subject does Amit major in?
a) Finance
b) Operations
c) Cannot be determined uniquely from the given information
d) Marketing

4) If Chitra majors in Finance, which subject does Bandita major in?
a) Finance
b) Operations
c) Cannot be determined uniquely from the given information
d) Marketing

Solution:
Let Daisy and Amit are from some institute A . Adriana and Ded be from the some institute B. So Bandita and Chitra must be from same institute (let's say C) but as only two females are from Z so Bandita and Chitra must be from Z. Now the given information can be tabulated as bellow –

Name	Gender	Institute	Major	Minor
Adriana	Female	B		
Bandita	Female	Z		
Chitra	Female	Z		
Daisy	Female	A		O
Amit	Male	A		
Barun	Male	Y	O	
Chetan	Male	X	F	
Deb	Male	B		

From point 3) three female students minor in Marketing and Daisy minors in operations (O) so other three must have minored in Marketing (M)
From point 2) Female student from Y majors in operations so Daisy cannot be from Y so Daisy is from X so is Amit. So Adriana and Deb are form Y. Also Barun and Deb both will miner in Finance (F) and Adrina will major in Operation (O).
Now the table will look like ,

Name	Gender	Institute	Major	Minor
Adriana	Female	Y	O	M
Bandita	Female	Z	F/O	M
Chitra	Female	Z	F/O	M
Daisy	Female	X	F/M	O
Amit	Male	X	F	O/M
Barun	Male	Y	O	F
Chetan	Male	X	F	O/M
Deb	Male	Y	M	F

Now all the questions can be answered.
1. a) **Bandita and Chitra**
2. c*)* ***Finance***
3. a) **Finance**
4. b) **operation**

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

Twenty four people are part of three committees which are to look at research, teaching, and administration respectively. No two committees have any member in common. No two committees are of the same size. Each committee has three types of people: bureaucrats, educationalists, and politicians, with at least one from each of the three types in each committee. The following facts are also known about the committees:

1. The numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee.
2. The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in

the research committee is the average of the numbers of educationalists in the other two committees.

3. 60% of the politicians are in the administration committee, and 20% are in the teaching committee.

1) Based on the given information, which of the following statements MUST be FALSE?
a) The size of the research committee is less than the size of the teaching committee
b) In the teaching committee the number of educationalists is equal to the number of politicians
c) The size of the research committee is less than the size of the administration committee
d) In the administration committee the number of bureaucrats is equal to the number of educationalists

2) What is the number of bureaucrats in the administration committee?
Answer: 4

3) What is the number of educationalists in the research committee?
Answer: 3

4) Which of the following CANNOT be determined uniquely based on the given information?
a) The size of the teaching committee
b) The size of the research committee
c) The total number of educationalists in the three committees
d) The total number of bureaucrats in the three committees
Solution:
Let the number of bureaucrats in the research committee = x and total number of politicians = y
From point 1) Then number of bureaucrats in the teaching and administration committees will be x and 4x/3 respectively.
From point 3) number of the politicians in the administration committee teaching committee will be 0.6y and 0.2y respectively.
Now let Number of educationalist in research , teaching and administration department are a, b and z such that a > b and a = (b+z)/2 thus z > a > b and a+b+z = 3a
From the given information following table can be made :

	Research	Teaching	Administration	Total
Bureaucrats	x	x	4x/3	10x/3

Politicians	0.2y	0.2y	0.6y	y
Educationalist	a > b	b	z	3a

Now as all the values in the table must be integers so minimum value of x = 3 and y = 5 also
10x/3 + y + 3a = 24
So the only possible value for a, x and y are 3, 3 and 5 . Thus the table with required number of people in each committees will be

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Politicians	1	1	3	5
Educationalist	3	2	4	9
Total	7	6	11	

Or

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Politicians	1	1	3	5
Educationalist	3	1	5	9
Total	7	5	12	24

Now all the question can be answered :
1) a) **The size of the research committee is less than the size of the teaching committee**
2) 4
3) 3
4) a) The size of the teaching committee

The following set contains four questions related to Logical Reasoning. Choose the best answer to each question.

Fuel contamination levels at each of 20 petrol pumps P1, P2, …, P20 were recorded as either high, medium, or low.

1. Contamination levels at three pumps among P1 – P5 were recorded as high.

2. P6 was the only pump among P1 – P10 where the contamination level was recorded as low.
3. P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded.
4. High contamination levels were not recorded at any of the pumps P16 – P20.
5. The number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded.

1) Which of the following MUST be true?

a) The contamination level at P20 was recorded as medium.
b) The contamination level at P10 was recorded as high.
c) The contamination level at P12 was recorded as high.
d) The contamination level at P13 was recorded as low.

2) What best can be said about the number of pumps at which the contamination levels were recorded as medium?

a) At least 8
b) More than 4
c) Exactly 8
d) At most 9

3) If the contamination level at P11 was recorded as low, then which of the following MUST be true?

a) The contamination level at P14 was recorded as medium.
b) The contamination level at P18 was recorded as low.
c) The contamination level at P15 was recorded as medium.
d) The contamination level at P12 was recorded as high.

4) If contamination level at P15 was recorded as medium, then which of the following MUST be FALSE?

a) Contamination level at P14 was recorded to be higher than that at P15.
b) Contamination levels at P13 and P17 were recorded as the same.
c) Contamination levels at P11 and P16 were recorded as the same.
d) Contamination levels at P10 and P14 were recorded as the same.

Solution:

From point 2) we can say that P6 was the only pump among P1 – P10 where the contamination level was recorded as low and in other pipe it can be either medium or high .

From point 3) only P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded

And From point 1) Contamination levels at three pumps among P1 – P5 were recorded as high it means P1 , P3 and P5 have high Contamination level and P2 and P4 will have medium Contamination level. Thus we get two possible cases for P1 to P10 .

Case a)

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
H	M	H	M	H	L	H	H	M	H

Case b)

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
H	M	H	M	H	L	M	M	H	M

From point 5)

H = 2L

Thus H + L = 3L must be multiple of 3.

Case 1) From point 4) High contamination levels were not recorded at any of the pumps P16 – P20.

So maximum possible number of pipe with High contamination levels = 8 (P1,P3,P5,P7,P8 ,P10 , P12 and P14)

In this case number of pipes with Low contamination levels = 8/2 = 4

So medium (M) = 8

The possible arrangement will be

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
H	M	H	M	H	L	H	H	M	H	M	H	M	H	M/L	L/M	M/L	L/M	M/L	L/M

Or

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
H	M	H	M	H	L	H	H	M	H	L	M	H	M	H	M	L	M	L	M

Case 2) if Low contamination levels pipes were minimum , which can be 3,then number of pipes with high contamination level = 6

Number of pipes with medium contamination level = 11 which is not possible .

So only case 1) is possible

Now all the questions can be answered.

1) b) **The contamination level at P10 was recorded as high**
2) c) **Exactly 8**
3) a) **The contamination level at P14 was recorded as medium**
4) c) **Contamination levels at P11 and P16 were recorded as the same**.

Quantitative Aptitude

If $\log_2(5 + \log_3 a) = 3$ and $\log_5(4a + 12 + \log_2 b) = 3$, then a + b is equal to?

a) 59
b) 40
c) 67
d) 32

Solution:
Given, **$\log_2(5 + \log_3 a) = 3$**
$5 + \log_3 a = 2^3 = 8$
$\log_3 a = 3$
so a = $3^3 = 27$
Now log(base5) (4a+12+log(base2) b)=3
Or 4a + 12 + log(base2) b) = 125
log(base2) b = 125-12-4×27=5
So $b = 2^5 = 32$
Thus a+b = 59

Train T leaves station X for station Y at 3 pm. Train S, traveling at three quarters of the speed of T, leaves Y for X at 4 pm. The two trains pass each other at a station Z, where the distance between X and Z is three-fifths of that between X and Y. How many hours does train T take for its journey from X to Y? (TITA)

Answer: **15**

Solution:

Let the total distance XY = 5x so XZ = 3x and YZ = 2x
Ratio of time taken by train T and train S to reach Z from their respective Station = (3x/v : 2x/3v/4)
= 9 : 8
Thus (9t -1) = 8t
t = 1
so time taken by train T to cover 3x = 9 hour
so time taken by train T to cover XY (5x) = 5/3 *9 = 15 hour

If log(base12) 81=p then 3 { (4-p)/(4+p)} is equal to

a) log (base2) 8
b) log (base4) 16
c) log (base6) 8
d) log (base6) 16

Solution:
Given , log(base12) 81 = p
4 log (base12) 3 = p
So 3 (4-p)/(4+p) = 3 (1- log(base12) 3)/(1+ log(base12) 3)=3 × log(base12)(12/3)/log(base12)(12×3) = 3×log(base36) 4 = log(base6) 8
Answer: c) log (base6) 8

Two types of tea, A and B, are mixed and then sold at Rs. 40 per kg. The profit is 10% if A and B are mixed in the ratio 3:2, and 5% if this ratio is 2:3. The cost prices, per kg, of A and B, are in the ratio?

a) 19:24
b) 18:25
c) 21:25
d) 17:25

Solution:
When A and B are mixed in the ratio 3:2, CP = (3A+2B)/(5)=40/1.1
3A +2B = 2000/11 ——-1)
When A and B are mixed in the ratio 2:3, CP = (2A+3B)/(5)=40/1.05
2A +3B = 20000/105 = 4000/21 ————2)
By solving eq 1) & 2)
A = 7600/21*11 and B = 9600/21*11
Thus A:B = 19:24
Option a) 19:24 is correct.

The number of integers x such that $0.25 < 2^x < 200$, and $2^x + 2$ is perfectly divisible by either 3 or 4, is?

Answer: **5**

Solution: **as given $0.25 \leq 2^x \leq 200$**

Or ¼ $\leq 2^X \leq$ 200
So x = { -2, -1, 0,1,2,3,4,5,6,7}
Now 2^X +2 will be perfectly divisible by 3 if x is even non-negative integer and will be divisible by 4 if x = 1
So number of possible solution = 5 { x = 0, 1, 2, 4 ,6}

Q. Let $f(x) = \min\{2x^2, 52-5x\}$, where x is any positive real number. Then the maximum possible value of f(x) is (TITA)?

Answer: **32**

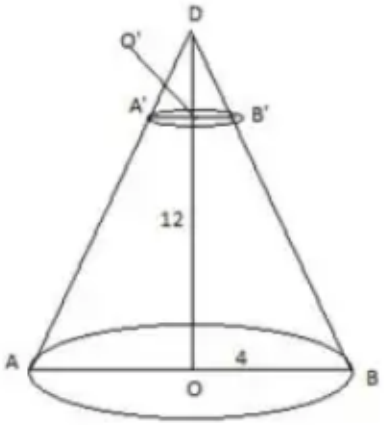
Solution: **for maximum possible value , $2x^2 = 52-5x$**

$2x^2 + 5x - 52 = 0$
(x -4)*(x+6.5) = 0
So x = 4 (as x is positive real number)
Maximum possible value of f(x) = $2x^2 = 52-5x$ = 32

Q. A right circular cone, of height 12 ft, stands on its base which has diameter 8 ft. The tip of the cone is cut off with a plane which is parallel to the base and 9 ft from the base. With π = 22/7, the volume, in cubic ft, of the remaining part of the cone is (TITA)?

Answer: **198**

Solution:



OO' = 9 , OB = 4 , A'D = 3
in similar triangle DO'B' and DOB,
DO'/OD = O'B'/OB
3/12 = O'B'/4
so O'B' = 1

Volume of remaining part (A'B'BA) = 1/3 *22/7 { 4^2 * 12 – 1^2 *3 } = 22/21 *189 = 198

Q. A CAT aspirant appears for a certain number of tests. His average score increases by 1 if the first 10 tests are not considered, and decreases by 1 if the last 10 tests are not considered. If his average scores for the first 10 and the last 10 tests are 20 and 30, respectively, then the total number of tests taken by him is?

Answer: 60

Solution: **let total number test taken by him = n and average score = x**
So average score of last (n-10) test = x+1

Sum of scores of last n-10 test = (n-10)*(x+1) = nx – (10x – n + 10)
So total score of first 10 test = 10x – n + 10
20*10 = 10x – n + 10
10x – n = 190 ————————1)
average score of first (n-10) test = x-1
Sum of scores of first n-10 test = (n-10)*(x-1) = nx – (n +10x – 10)
So total score of first 10 test = (n +10x – 10)
30*10 = (n +10x – 10)
n + 10x = 310 ————————2)
by solving eq 1) & eq 2)
n = 60, x = 25
so total number of test taken by him = 60

Q. A trader sells 10 litres of a mixture of paints A and B, where the amount of B in the mixture does not exceed that of A. The cost of paint A per litre is Rs. 8 more than that of paint B. If the trader sells the entire mixture for Rs. 264 and makes a profit of 10%, then the highest possible cost of paint B, in Rs. per litre, is?

a) 26
b) 22
c) 20
d) 16

Solution: let cost of paint A = x / liter
So cost of paint B = (x-8)/liter
Cost of 10 liter of the mixture = 264/1.1 = 240
Cost per liter of mixture = 240/10 = 24
For highest possible cost of paint B, both A and B should be in equal ratio , so
Cost of mixture = (x+ x -8)/2
24 = (2x -8)/2
x = 28
thus cost of paint B = 28 -8 = 20 per liter
option c) 20 is correct

Q. The distance from A to B is 60 km. Partha and Narayan start from A at the same time and move towards B. Partha takes four hours more than Narayan to reach B. Moreover, Partha reaches the mid-point of A and B two hours before Narayan reaches B. The speed of Partha, in km per hour, is?

a) 5
b) 3
c) 4
d) 6

Answer: a) 5

Solution: **let time taken by Narayan to reach B = t hour**
So time taken by Partha to reach B = (t+4) hours
Time taken by Partha to reach mid point of A and B = (t+ 4)/2
Given t – (t+ 4)/2 = 2
2t – t – 4 = 4
t = 8 hours
Speed of Partha = 60/(t+4) = 60/12 = 5 km/hour
Correct option a) 5

Q. In a circle, two parallel chords on the same side of diameter have lengths 4 cm and 6 cm. If the distance between these chords is 1 cm, then the radius of the circle, in cm, is?

a) √11
b) √13
c) √12
d) √14
Solution: Option b) √13 is correct

If f(x + 2) = f(x) + f(x + 1) for all positive integers x, and f(11) = 91, f(15) = 617, then f(10) equals?

Answer: 54

Solution:

Given , f(x + 2) = f(x) + f(x + 1)

f(15) = f(13) + f(14)

f(13) + f(14) = 617 ——————1)

f(12) + f(13) = f(14) ——————-2)

f(11) + f(12) = f(13)——————-3)

from eq 1) , 2) & 3)

2f(11) + 3f(12) = 617

Putting f(11) = 91

f(12) = (617 – 2*91)/3 = 145

f(12) = f(11) + f(10)

so f(10) = f(12) – f(11) = 145 – 91 =54

Answer: 54

Q. If among 200 students, 105 like pizza and 134 like burger, then the number of students who like only burger can possibly be?

a) 96
b) 23
c) 93
d) 26

Answer: c) 93

Solution:
Surplus = 105 + 134 – 200 = 39
So there will be minimum 39 students who will like both pizza and burger. And maximum number of students who like both can be 105.
So minimum number of students who like only burger = 134 – 105 = 29
And maximum number of students who like only burger = 134 – 39 = 95
Thus from given option only option c) 95 can be the number of students who like only burger.

Q.Point P lies between points A and B such that the length of BP is thrice that of AP. Car 1 starts from A and moves towards B. Simultaneously, car 2 starts from B and moves towards A. Car 2 reaches P one hour after car 1 reaches P. If the speed of car 2 is half that of car 1, then the time, in minutes, taken by car 1 in reaching P from A is?

Answer: 12

Solution:

Ratio of time taken by car 1 and car 2 = (x/2v) : (3x/v) = 1 : 6 = t : 6t
Given 6t – t = 60 minutes
Or 5t = 60
Thus t = 12 minutes
Answer: 12

Q. Given that x^2018 y^2017 =1/2 and x^2016 y^2019= 8,the value of x^2 + y^3 is?**a) 33/4**

b) 35/4
c) 31/4
d) 37/4

Answer: **a) 33/4**

Solution:

Given, x^2018 y^2017 =1/2————————1)
x^2016 y^2019= 8————————-2)
By dividing eq 1) with eq 2)
x^2/y^2 =1/16———3)
By multiplying eq 1) with eq 2)
x^4034 y^4036=(xy)^4034 y^2= 4———4)
From eq 3) & eq) 4 we can say x = ½ and y = 2
So x^2 + y^3=1/4+8=33/4

Q. While multiplying three real numbers, Ashok took one of the numbers as 73 instead of 37. As a result, the product went up by 720. Then the minimum possible value of the sum of squares of the other two numbers is?

Answer: **40**

Solution: **Let the other two numbers are a & b so**
73ab – 37ab = 720
Or 36ab = 720
ab = 20
using A.M.≥G.M
(a^2+b^2)/2 ≥(a^2 b^2)^(1/2)=ab
(a^2+b^2) ≥2ab=40
So minimum required value = 40

Q. If u^2 + (u-2v-1)^2 = -4v(u + v), then what is the value of u + 3v?

a) -1/4
b) ½
c) 0
d) ¼

Solution:

Given, u^2 + (u-2v-1)^2 = -4v(u + v)

Or u^2+4vu+4 v^2 +(u-2v-1)^2 = 0
(u+2v)^2+ (u-2v-1)^2= 0
This will be zero only if u = -2v = 2v + 1
Or v = -1/4 & u = ½
So u + 3v = -1/4
Option a) -1/4 is correct.

Q. John borrowed Rs. 2,10,000 from a bank at an interest rate of 10% per annum, compounded annually. The loan was repaid in two equal instalments, the first after one year and the second after another year. The first instalment was interest of one year plus part of the principal amount, while the second was the rest of the principal amount plus due interest thereon. Then each instalment, in Rs., is?

Answer: **121000**

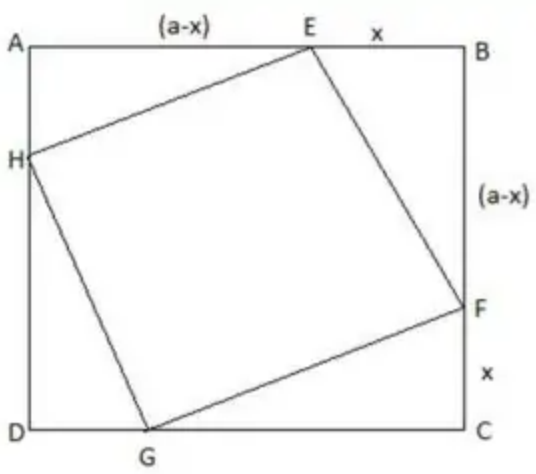
Solution:

Let the amount repaid in each installment was x. So
210000×(1.1)^2=x ×1.1+x
210000×1.21=2.1x
Or x=121000

Q. Points E, F, G, H lie on the sides AB, BC, CD, and DA, respectively, of a square ABCD. If EFGH is also a square whose area is 62.5% of that of ABCD and CG is longer than EB, then the ratio of length of EB to that of CG is?

a) 2 : 5
b) 4 : 9
c) 3 : 8
d) 1 : 3

Solution:



in triangle EBF ,EF^2=x^2+(a-x)^2
Ratio of Areas = AB^2:EF^2
1:5/8=a^2: { x^2+(a-x)^2 }
8/5=a^2/(2x^2+a^2-2x)
16x^2+8a^2-16ax=5a^2
16x^2-16ax+3a^2=0
16x^2-12ax-4ax+3a^2=0
(4x-3a)(4x-a)=0
So 4x=a or 4x=3a
Thus CG=a-x=3x or 1/3 x
As CG > EB so CG = 3x
EB : CG = 1 : 3
Option d) 1:3 is correct.

Q. If x is a positive quantity such that 2^x = 3^log(base5)^2 , then x is equal to?

a) log(base5)^9
b) 1 + log(base5) 3/5
c) log(base5)^8
d) 1 + log(base3) 5/3

Answer: **b) 1 + log(base5) 3/5**

Solution:
Given , 2^x = 3^log(base5)2
taking log of both sides ,
x log2 = log(base5) 2 log 3 = (log 2 log 3)/log5
Or x = log 3/log 5 = log(base5) 3 = 1+ log(base5) 3/5

Q. Humans and robots can both perform a job but at different efficiencies. Fifteen humans and five robots working together take thirty days to finish the job, whereas five humans and fifteen robots working together take sixty days to finish it. How many days will fifteen humans working together (without any robot) take to finish it?

a) 36
b) 40
c) 45
d) 32

Answer: **d) 32**

Solution:

Given, 15/H+5/R=1/30 ——-1)
And 5/H+15/R=1/60 ———2)
By solving eq 1) & eq 2) we get
1/(H)=1/(40×12)
Thus H = 40×12
So time taken by 15 humans = 40×12/15=32

Q. Given an equilateral triangle T1 with side 24 cm, a second triangle T2 is formed by joining the midpoints of the sides of T1. Then a third triangle T3 is formed by joining the midpoints of the sides of T2. If this process of forming triangles is continued, the sum of the areas, in sq cm, of infinitely many such triangles T1, T2, T3,... will be?

a) 164√3
b) 188√3

c) 248√3
d) 192√3

Answer: **d) 192√3**

Solution:

As P,Q and R are mid points of AC,AB and BC so both triangle PQR and CBA will be similar and PQ = BC/2
So if the area of triangle ABC = A then area of triangle PQR = A/4
Thus
Sum of Areas = A+A/4+A/16+A/64+ ———=A/(1-1/4)=4/3
A=4/3×√3/4×24^2=192√3

Q. Let x, y, z be three positive real numbers in a geometric progression such that x < y < z. If 5x, 16y, and 12z are in an arithmetic progression then the common ratio of the geometric progression is?

a) 5/2
b) 1/6
c) 3/2
d) 3/6

Solution:
Given x,y, z are in GP . let common ratio of this GP is r so y=xr & z=xr^2
Now 5x, 16y and 12z are in A.P. So
12z-16y=16y-5x
32y=12z+5x
32xr=12xr^2+5x
12r^2-32r+5=0
(6r-1)(2r-5)=0
So r=1/6 or 5/2
As given x < y < z so r >1
Thus r = 5/2
Option a) 5/2 is correct

Q. A wholesaler bought walnuts and peanuts, the price of walnut per kg being thrice that of peanut per kg. He then sold 8 kg of peanuts at a profit of 10% and 16 kg of walnuts at a profit of 20% to a shopkeeper. However, the shopkeeper lost 5 kg of walnuts and 3 kg of peanuts in transit. He then mixed the remaining nuts and sold the mixture at Rs. 166 per kg, thus making an overall profit of 25%. At what price, in Rs. per kg, did the wholesaler buy the walnuts?

a) 84
b) 96
c) 86
d) 98

Solution:
let the CP of walnuts for wholesaler was 3x and that of peanuts was x so
SP of 8 kg of peanuts and 16 kg of walnuts = 8*1.1x + 16*1.2*3x = 66.4x
The shopkeeper gets 25% profit so SP = 1.25*66.4x =83x
As per question 83x = 166*(8+16 – 5-3) = 166*16
So x = 32
So CP of walnuts = 3x = 96
Correct answer: **b) 96**

Q. Each of 74 students in a class studies at least one of the three subjects H, E and P. Ten students study all three subjects, while twenty study H and E, but not P. Every student who studies P also studies H or E or both. If the number of students studying H equals that studying E, then the number of students studying H is?

Answer : 52

Solution:
On the basis of given information , following venn-diagram can be made

Now as the number of students studying H equals that studying E, so remaining (74 – 10 – 20 = 44) students must be equally distributed to E and H . So number students studying H = 10+20+ 44/2 = 52

Q. When they work alone, B needs 25% more time to finish a job than A does. They two finish the job in 13 days in the following manner: A works alone till half the job is done, then A and B work together for four days, and finally B works alone to complete the remaining 5% of the job. In how many days can B alone finish the entire job?

a) 22
b) 18
c) 20
d) 16

Solution:
ratio of time taken by A and B to complete the work alone = 1: 1.25 = 4x : 5x
As A complete half of the work alone and B complete 5% of the work alone, so they will complete remaining 45% of work in 4 days .
So time taken by them to complete the whole work together = 4 * 100/45 = 80/9
Or (4x*5x)/(4x+5x) = 80/9
x = 4
Thus time taken by B to complete the work alone = 5x = 20 days
correct answer c) 20

How many numbers with two or more digits can be formed with the digits 1,2,3,4,5,6,7,8,9, so that in every such number, each digit is used at most once and the digits appear in the ascending order?

Answer: **510**

Solution :
As all given digits are different natural numbers and we have to use them at most once, ways of arrangements for each set of digits will be exactly once.
Thus Total such numbers = 9(baseC2) + 9(baseC3) +9(baseC4) +9(baseC5) +9(baseC6) + 9(baseC7) +9(baseC8) +9(baseC9) = 2^9 – 2 = 510

Q.Raju and Lalitha originally had marbles in the ratio 4:9. Then Lalitha gave some of her marbles to Raju. As a result, the ratio of the number of marbles with Raju to that with Lalitha became 5:6. What fraction of her original number of marbles was given by Lalitha to Raju?

a) 6/19
b) 7/33
c) 1/5
d) ¼

Solution:
Let original number of marbles with Raju and Lalitha are 4x and 9x respectively. Let Lalitha gave n marbles to Raju and the ratio becomes 5:6
So (4x+n)/(9x-n)=5/6
24x+6n=45x-5n
21x=11n
n=21x/11
Fraction of marbles given by Lalitha to Raju = n/9x=(21x/11)/9x=7/33
Correct answer b) 7/33

Q. In an examination, the maximum possible score is N while the pass mark is 45% of N. A candidate obtains 36 marks, but falls short of the pass mark by 68%. Which one of the following is then correct?

a) 201 ≤ N ≤ 242.
b) N ≥ 253.
c) 243 ≤ N ≤ 252.
d) N ≤ 200.

Solution:
From the question we can say (100% – 68%) of (45% of N) = 36
Or 32/100×45/100 N=36
N=360000/(32×45)=250

Correct option **c) 243 ≤ N ≤ 252**

A tank is fitted with pipes, some filling it and the rest draining it. All filling pipes fill at the same rate, and all draining pipes drain at the same rate. The empty tank gets completely filled in 6 hours when 6 filling and 5 draining pipes are on, but this time becomes 60 hours when 5 filling and 6 draining pipes are on. In how many hours will the empty tank get completely filled when one draining and two filling pipes are on? TITA

Answer: **10**

Solution: **Let each filling pipe alone can fill the tank in F hours and each draining tank alone can empty the tank in D hours. So**
6/F-5/D=1/6————-1)
5/F-6/D=1/60————-2)
by solving the above equations, F=12 and D=15
So 2/F-1/D=2/12-1/15=1/10
Thus required time = 10/1 = 10 hours

Answer: **10**

Q. In a circle with center O and radius 1 cm, an arc AB makes an angle 60 degrees at O. Let R be the region bounded by the radii OA, OB and the arc AB. If C and D are two points on OA and OB, respectively, such that OC = OD and the area of triangle OCD is half that of R, then the length of OC, in cm, is?

a) (π/6)^(1/2)
b) (π/(4√3))^(1/2)
c) (π/(3√3))^(1/2)
d) (π/4)^(1/2)

Answer: **c) (π/(3√3))^(1/2)**

Solution:

As OC =OD so angle OCD = angle ODC =(180 -60)/2 = 60
So triangle OCD is an equilateral triangle,
Area of OCD = √3/4 OC^2 = 1/6×π×1^2

OC^2 = π/(3√3)
So OC= (π/(3√3))^(1/2)

Let ABCD be a rectangle inscribed in a circle of radius 13 cm. Which one of the following pairs can represent, in cm, the possible length and breadth of ABCD?
a) 25, 10
b) 24, 12
c) 25, 9
d) 24, 10

Answer: d) 24, 10

As ABCD is a rectangle angles A,B,C and D will be 90°. Thus AC will be diameter of circle of length 13*2 = 26
So length , width and 26 will form a Pythagorean triplet . From given options ,
only option d) 24, 10 satisfy this condition as
10^2+24^2=26^2

Q. In an apartment complex, the number of people aged 51 years and above is 30 and there are at most 39 people whose ages are below 51 years. The average age of all the people in the apartment complex is 38 years. What is the largest possible average age, in years, of the people whose ages are below 51 years?

a) 27
b) 25
c) 26
d) 28

Answer: **d) 28**

Solution:
Let there are n people whose ages are below 51 years. So
Sum of ages of all people = 38×(30+n)
The average age of the people whose ages are below 51 years will be

maximum if average age of people aged 51 years or above will be 51 years.
So Sum of ages of these n people = 38(30+n)-51×30=38n-390
So required average age = (38n-390)/n=38-390/n
This will be maximum when n will be maximum and maximum possible value of n = 39
So maximum possible average age of the people whose ages are below 51 years = 38 –390/39=28

Q.In a parallelogram ABCD of area 72 sq cm, the sides CD and AD have lengths 9 cm and 16 cm, respectively. Let P be a point on CD such that AP is perpendicular to CD. Then the area, in sq cm, of triangle APD is?
a) 24√3
b) 12√3
c) 32√3
d) 18√3

Answer: **c) 32√3**

As given, Area of parallelogram ABCD = 72
So AB×AP=72
9AP=72
AP = 8 cm
in right-angled triangle APD, AP^2 + PD^2 = AD^2
So PD^2 = AD^2-AP^2 = 16^2-8^2 = 64×3
PD=8√3
Thus Area of triangle APD = 1/2 AP×PD = 1/2×8×8√3 = 32√3