QUANTIFIERS
CAT ACADEMY

MAKING EDUCATION EASIER

CAT 2018

SLOT 1

Click here to download FREE CAT Material Used by 99%ilers

Get FREE Quantifiers DAILY TARGET by Quantifiers on your WhatsApp by filling out this Google form. (Clickable link hyperlinked)
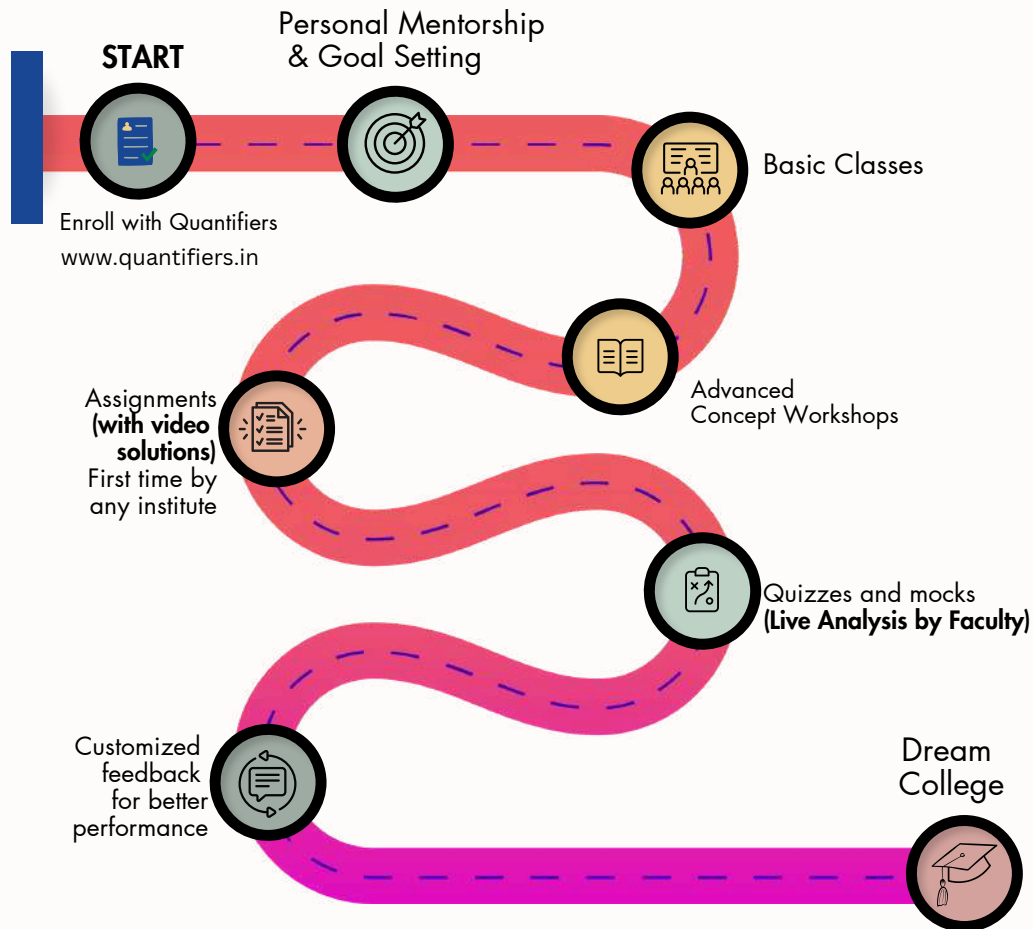
Trusted by more than 2 lakh CAT Aspirants

www.quantifiers.in

Call/WA @9988656560/7986961408 to book a free demo class

JOURNEY WITH QUANTIFIERS!

START

Enroll with Quantifiers
www.quantifiers.in

Personal Mentorship & Goal Setting

Basic Classes

Advanced Concept Workshops

Assignments **(with video solutions)** First time by any institute

Quizzes and mocks **(Live Analysis by Faculty)**

Customized feedback for better performance

Dream College

Next one could be you!!

CAT COURSE COMPARISION
QUANTIFIERS VS OTHER INSTITUTES

QUANTIFIERS ONLINE COURSE	COURSE FEATURES	OTHER Coachings
✓	Basic Classes	✓
✓	Workshops	✗
✓	Assignments (with video solutions)	✗
✓	Personal Mentoring	✗
25-30	Batch Size	Minimum 500
✓	Live Mock Analysis	✗
✓	24*7 doubt solving by faculty	✗
✓	OMET'S Crash Course	Not included
✓	Sectionals with video solutions	✗
✓	Hard copy books	✗

Preity — 99.01%ile — IIM Lucknow
Pallavi — 99.64%ile — IIM Calcutta
Pallav Goyal — 99.98%ile — IIM Ahmedabad
Nikhil — 99.96%ile — FMS
Neharika — 98.4%ile — MDI
Mrinalini — IIM Jammu

Sonia — 98.5%ile — IIM Lucknow
Sunanda — 99.11%ile — IIM Bangalore
Supraja — 97.8%ile — SIBM Pune
Supriya — 99.63%ile — IIM Bangalore
Swarnima — 98.6%ile — IIM Lucknow
Tapsi — 99.48%ile — IIM Calcutta

Shashank — 97.6%ile — MDI
Shivani — 96.27%ile — IIM Lucknow
Shreya — 97.5%ile — NMIMS
Siddharth — 99.52%ile — IIM Udaipur
Simran — 97.5%ile — NMIMS
Smriti — 98.13%ile — XLRI

Ruchi — 98.93%ile — IIM Shillong
Rohan — 99.1%ile — IIFT
Riya — 96.3%ile — IIM Rohtak
Ritvik — 99.7%ile — IIM Calcutta
Rishabh — 99.94%ile — IIM Calcutta
Priyanshu — 99.34%ile — IISc Bangalore

CAT 2018 SLOT- 1 VARC

DIRECTIONS for the question: Read the passage and answer the question based on it.

"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 behaviour 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 behaviour 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 behaviour typically associated with post-traumatic stress disorder and other trauma-related

disorders in humans: abnormal startle response, unpredictable asocial behaviour, 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. In the first paragraph, Bradshaw uses the term "violence" to describe the recent change in the human-elephant relationship because, according to him:
   A) both humans and elephants have killed members of each other's species.
   B) elephant herds and their habitat have been systematically destroyed by humans.
   C) there is a purposefulness in human and elephant aggression towards each other.
   D) human-elephant interactions have changed their character over time.

2. Which of the following measures is Bradshaw most likely to support to address the problem of elephant aggression?
   A) The development of treatment programmes for elephants drawing on insights gained from treating post-traumatic stress disorder in humans.
   B) Studying the impact of isolating elephant calves on their early brain development, behaviour and aggression.
   C) Increased funding for research into the similarity of humans and other animals drawing on insights gained from human-elephant similarities.
   D) Funding of more studies to better understand the impact of testosterone on male elephant aggression.

3. Which of the following statements best expresses the overall argument of this passage?
   A) The brain organisation and early development of elephants and humans are extremely similar.
   B) The relationship between elephants and humans has changed from one of coexistence to one of hostility.
   C) Recent elephant behaviour could be understood as a form of species-wide trauma-related response.
   D) Elephants, like the humans they are in conflict with, are profoundly social creatures.

4. The passage makes all of the following claims EXCEPT:
   A) elephants establish extended and enduring familial relationships as do humans.
   B) elephant mothers are evolving newer ways of rearing their calves to adapt to emerging threats.
   C) the elephant response to deeply disturbing experiences is similar to that of humans.

D) human actions such as poaching and culling have created stressful conditions for elephant communities.

5. In paragraph 4, the phrase, "The fabric of elephant society . . . has[s] effectively been frayed by . . ." is:
    A) a metaphor for the effect of human activity on elephant communities.
    B) an exaggeration aimed at bolstering Bradshaw's claims.
    C) an accurate description of the condition of elephant herds today.
    D) an ode to the fragility of elephant society today.

DIRECTIONS for the question: Read the passage and answer the question based on it.

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

3

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.

6. Which of the following, if found to be true, would negate the main message of the passage?
    A) A study indicating the primacy of ecological impact on human adaptation.
    B) A study affirming the sole influence of natural selection and inheritance on evolution.
    C) A study highlighting the criticality of epigenetic inheritance to evolution.
    D) A study affirming the influence of socio-cultural markers on evolutionary processes.

7. The passage uses the metaphor of a dog walker to argue that evolutionary adaptation is most comprehensively understood as being determined by:
    A) ecological, hormonal, extra genetic and genetic legacies
    B) socio-cultural, genetic, epigenetic, and genomic legacies
    C) extra genetic, genetic, epigenetic and genomic legacies
    D) genetic, epigenetic, developmental factors, and ecological legacies

8. The Emory University experiment with mice points to the inheritance of:
    A) personality traits
    B) acquired parental fears
    C) acquired characteristics
    D) psychological markers

9. Which of the following best describes the author's argument?
    A) Darwin's and Mendel's theories together best explain evolution
    B) Darwin's theory of natural selection cannot fully explain evolution
    C) Wilson's theory of evolution is scientifically superior to either Darwin's or Mendel's

D) Mendel's theory of inheritance is unfairly underestimated in explaining evolution

DIRECTIONS for the question: Read the passage and answer the question based on it.

[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 post war 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.

10. 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 misplaced priorities of the post-independence Indian governments

B) a reflection of the academic and popular view of India's role in the War

C) appropriate as their names can always be included in the India Gate memorial

D) is something which can be rectified in future by constructing a separate memorial

11. In the first paragraph, the author laments the fact that:

A) India lost thousands of human lives during the Second World War

B) the new war memorial will be built right next to India Gate

C) funds will be wasted on another war memorial when we already have the India Gate memorial

D) there is no recognition of the Indian soldiers who served in the Second World War

12. 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) has been focused on building an independent, non-colonial political identity.

B) wants to forget the human and financial toll of the War on the country

C) views the War as a predominantly Allied effort, with India playing only a supporting role

D) blames the War for leading to the momentous partition of the country

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

A) a part of the narrative on the ill-effects of colonial rule on India

B) a backdrop to the subsequent independence and partition of the region

C) setting the stage for the emergence of the India–Pakistan rivalry in the subcontinent

D) a tragic period in terms of loss of lives and national wealth

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

A) the large financial debt India owed to Britain after the War

B) independence of the subcontinent and its partition into two countries

C) large-scale deaths in Bengal as a result of deprivation and famine

D) US recognition of India's strategic location and role in the War

DIRECTIONS for the question: Read the passage and answer the question based on it.

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 odours 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 green washing front, as it has helped shift the public focus to consumer recycling behaviour 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.

15. 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) a "greenwash" because it was a benevolent attempt to improve public recycling habits
    D) an important step in sensitising producers to the need to tackle plastics pollution

16. 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) poisonous chemicals released into the water and food we consume
    C) adverse impacts on the digestive systems of animals exposed to plastic
    D) air pollution caused during the process of recycling plastics

17. Which of the following interventions would the author most strongly support :
    A) completely banning all single-use plastic bags
    B) passing regulations targeted at producers that generate plastic products
    C) recycling all plastic debris in the seabed
    D) having all consumers change their plastic consumption habits

18. In the first paragraph, the author uses "lie" to refer to the:
    A) understatement of the enormity of the plastics pollution problem
    B) understatement of the effects of recycling plastics
    C) fact that people do not know they have been lied to
    D) blame assigned to consumers for indiscriminate use of plastics

19. 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) focusing on single-use plastic bags to reduce the plastics footprint
    C) encouraging the responsible production of plastics by firms
    D) focusing on consumer behaviour to tackle the problem of plastics pollution

DIRECTIONS for the question: Read the passage and answer the question based on it.

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 behaviour, 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 Humanize 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.

20. From the passage we can infer that the author would like economists to:
    A) incorporate psychological findings into their research cautiously
    B) measure the effectiveness of Facebook and social media advertising
    C) work closely with neuroscientists to understand human behaviour

D) correlate measurements of happiness with economic indicators

21. In the author's opinion, the shift in thinking in the 1970s:
    A) put people in touch with their own feelings rather than depending on psychologists
    B) was a welcome change from the earlier view that depression could be cured by changing circumstances
    C) reflected the emergence of neuroscience as the authority on human emotions
    D) introduced greater stress into people's lives as they were expected to be responsible for their own happiness

22. The author's view would be undermined by which of the following research findings?
    A) A proliferation of gyms that are collecting data on customer well-being
    B) There is a definitive move towards the adoption of wearable technology that taps into emotions
    C) Stakeholders globally are moving away from collecting data on the well-being of individuals
    D) Individuals worldwide are utilising technologies to monitor and increase their well-being

23. According to the author, wearable technologies and social media are contributing most to:
    A) making individuals aware of stress in their lives
    B) depression as a thing of the past
    C) happiness as a "personal project"
    D) disciplining individuals to be happy

24. According to the author, Dubai:
    A) is on its way to becoming one of the world's happiest cities
    B) incentivises companies that prioritise worker welfare
    C) develops sophisticated technologies to monitor its inhabitants' states of mind
    D) collaborates with Facebook to selectively influence its inhabitants' moods

25. **DIRECTIONS for the question: Identify the most appropriate summary for the paragraph.**

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 unlike the natural development of identical twins from the embryo after fertilization

B) Artificial embryo twinning is low-tech and is close to the natural development of twins where the embryo splits into two identical twins

C) Artificial embryo twinning is low-tech and mimetic of the natural development of genetically identical twins from the embryo after fertilization

D) Artificial embryo twinning is just like the natural development of twins, where during fertilization twins are formed

26. **DIRECTIONS for the question: 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 interpretations 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

27. **DIRECTIONS for the question: 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 sentence 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

28. **DIRECTIONS for the question: 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. 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.

29. **DIRECTIONS for the question: 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 sentence 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.

30. **DIRECTIONS for the question: 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. 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.

31. **DIRECTIONS for the question: 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 sentence 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.

32. **DIRECTIONS for the question: Identify the most appropriate summary for the paragraph.**

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.

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

33. **DIRECTIONS for the question: 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 sentence 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.

34. **DIRECTIONS for the question: Identify the most appropriate summary for the paragraph and write the key for most appropriate option.**

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

13

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) Professions-approach focuses on the creation of institutions of higher education and disciplines to promote knowledge production

C) The study of knowledge production can be done through many perspectives

D) The professions-approach has been one of the most relied upon perspective in the study of management knowledge production
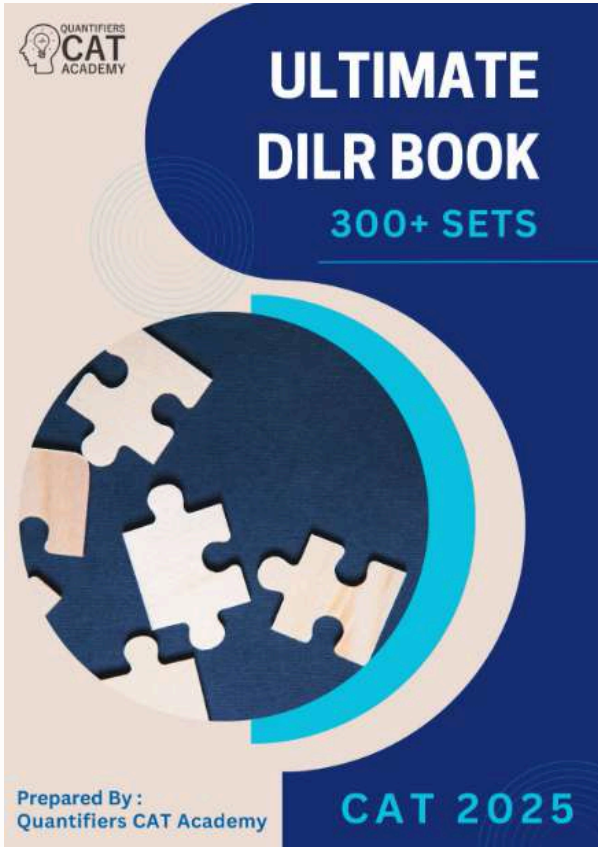
The best DILR Strategy to exist!
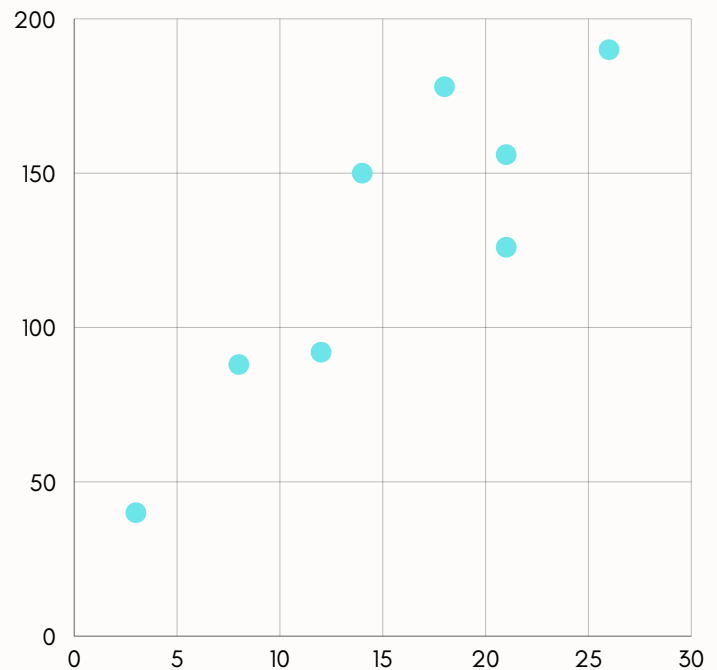
Download for free

DILR Strategy simplified

DILR Booster Test Series

- DILR Booster Test 1
- DILR Booster Test 2
- DILR Booster Test 3
- DILR Booster Test 4
- DILR Booster Test 5
- DILR Booster Test 6
- DILR Booster Test 7
- DILR Booster Test 8
- DILR Booster Test 9
- DILR Booster Test 10

- DILR Booster Test 11
- DILR Booster Test 12
- DILR Booster Test 13
- DILR Booster Test 14
- DILR Booster Test 15
- DILR Booster Test 16
- DILR Booster Test 17
- DILR Booster Test 18
- DILR Booster Test 19
- DILR Booster Test 20

- DILR Booster Test 21
- DILR Booster Test 22
- DILR Booster Test 23
- DILR Booster Test 24
- DILR Booster Test 25
- DILR Booster Test 26
- DILR Booster Test 27
- DILR Booster Test 28
- DILR Booster Test 29
- DILR Booster Test 30

Attempt now

If any link is not opening, try opening it in PC, press control and hover over the link

CAT 2018 SLOT-1 DILR

1. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

   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.

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

2. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

   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.

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

3. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

   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.

   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) 9
   B) 25
   C) 4
   D) 16

4. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

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.

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) 4
B) 16
C) 9
D) 25

DIRECTIONS for the question: Go through the graph and the information given below and answer the question that follows.

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.

| Candidate	Marks out of 20		
	DI	WE	GA
Ajay	8		16
Bala		9	11
Chetna	19	4	12
Danish	8	15	
Ester	12	18	16
Falak	15	7	10
Geeta	14		6
Harini	5		
Indu		8	
Jatin		16	14

5. 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) Both 1 and 2
   B) Only 2
   C) Both 2 and 3
   D) Only 1

6. Which of the following statements MUST be FALSE?
   A) Harini's composite score was less than that of Falak
   B) Bala's composite score was less than that of Ester
   C) Chetna scored more than Bala in DI
   D) Bala scored same as Jatin in DI

7. 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?

8. If all the candidates scored different marks in WE then what is the maximum marks that Harini could have scored in WE?

DIRECTIONS for the question: Look at the pie chart given and answer the following 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

17

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.
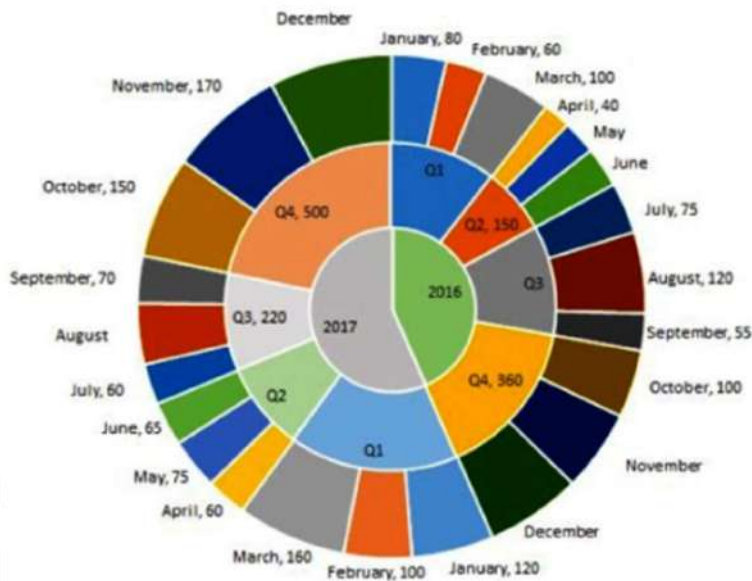
9. What is the percentage increase in sales in December 2017 as compared to the sales in December 2016?
   A) 50.00
   B) 22.22
   C) 38.46
   D) 28.57

10. 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

11. During which quarter was the percentage decrease in sales from the previous quarter's sales the highest?
    A) Q2 of 2017

B) Q1 of 2017
C) Q2 of 2016
D) Q4 of 2017

12. During which month was the percentage increase in sales from the previous month's sales the highest?
   A) October of 2017
   B) March of 2017
   C) March of 2016
   D) October of 2016

DIRECTIONS for the question: Read the information given below and answer the question that follows.

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.

13. Which of the following MUST be true?
   A) The contamination level at P10 was recorded as high
   B) The contamination level at P13 was recorded as low
   C) The contamination level at P12 was recorded as high
   D) The contamination level at P20 was recorded as medium

14. What best can be said about the number of pumps at which the contamination levels were recorded as medium?
   A) More than 4
   B) At least 8
   C) At most 9
   D) Exactly 8

15. If the contamination level at P11 was recorded as low, then which of the following MUST be true?
    A) The contamination level at P15 was recorded as medium
    B) The contamination level at P18 was recorded as low
    C) The contamination level at P12 was recorded as high
    D) The contamination level at P14 was recorded as medium

16. If contamination level at P15 was recorded as medium, then which of the following MUST be FALSE?
    A) Contamination levels at P13 and P17 were recorded as the same
    B) Contamination levels at P11 and P16 were recorded as the same
    C) Contamination levels at P10 and P14 were recorded as the same
    D) Contamination level at P14 was recorded to be higher than that at P15

DIRECTIONS for the question: Read the information given below and answer the question that follows.

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.

17. 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

18. What is the minimum possible number of satellites serving B exclusively?
    A) 500
    B) 250

C) 200

D) 100

19. If at least 100 of the 1600 satellites were serving O, what can be said about the number of satellites serving S?

A) Exactly 475

B) No conclusion is possible based on the given information

C) At least 475

D) At most 475

20. If the number of satellites serving at least two among B, C, and S is 1200, which of the following MUST be FALSE?

A) The number of satellites serving B is more than 1000

B) The number of satellites serving B exclusively is exactly 250

C) All 1600 satellites serve B or C or S

D) The number of satellites serving C cannot be uniquely determined

21. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

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.

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

22. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

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.

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?

23. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

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.

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

24. **DIRECTIONS for the question: Read the information given below and answer the question that follows.**

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.

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) 750
B) 900
C) 800
D) 1400

DIRECTIONS for the question: Read the information given below and answer the question that follows.

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.

25. 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) The size of the research committee is less than the size of the administration committee
   C) In the administration committee the number of bureaucrats is equal to the number of educationalists
   D) In the teaching committee the number of educationalists is equal to the number of politicians

26. What is the number of bureaucrats in the administration committee?

27. What is the number of educationalists in the research committee?

28. Which of the following CANNOT be determined uniquely based on the given information?
   A) The total number of bureaucrats in the three committees
   B) The size of the teaching committee
   C) The total number of educationalists in the three committees
   D) The size of the research committee

DIRECTIONS for the question: Read the information given below and answer the question that follows.

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.

29. Who are the students from the institute Z?
A) Chitra and Daisy
B) Adriana and Daisy
C) Bandita and Chitra
D) Adriana and Bandita

30. Which subject does Deb minor in?
A) Finance
B) Marketing
C) Cannot be determined uniquely from the given information
D) Operations

31. Which subject does Amit major in?
A) Cannot be determined uniquely from the given information
B) Marketing
C) Finance
D) Operations

32. If Chitra majors in Finance, which subject does Bandita major in?
A) Marketing
B) Cannot be determined uniquely from the given information
C) Finance
D) Operations

Complete CAT
Quant Course
Now on YouTube

Most Important Quant Topics Analysis

Click here to access all Quantifiers playlists
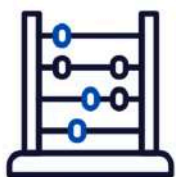
Click here to access all advanced level QA Questions

Click here to improve QA significantly

WATCH NOW

Number System
Explore the mathematical framework for representing numerical values using a defined set of symbols and rules

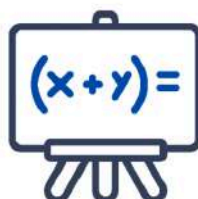Learn More

Geometry
Delve into the fascinating realm of shapes, sizes, properties of figures and spatial relationships with mathematical precision
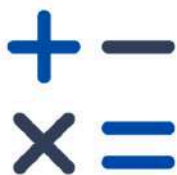
Learn More

Algebra
The master key to unlock the power of symbols, solve complex equations and problems, and analyze variables

Learn More

FREE TESTS for all QUANT TOPICS- ATTEMPT NOW

Arithmetic
Master the fundamental math operations for everyday calculations and a solid mathematical foundation refining concepts

Learn More

Probability
Navigate uncertainty while understanding the likelihood of events; making informed decisions using mathematical predictions

Learn More

Permutation Combination
Discover the art of arranging & selecting elements, a fundamental concept for solving puzzles

Learn More

QUANTIFIERS
CAT ACADEMY

CAT 2018 SLOT-1 QUANT

1. 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) 1/6
   B) 3/2
   C) 5/2
   D) 3/6

2. 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) 45
   B) 36
   C) 40
   D) 32

3. 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?

4. 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) 3 : 8
   B) 2 : 5
   C) 1 : 3
   D) 4 : 9

5.

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) ○ $248\sqrt{3}$

B) ○ $192\sqrt{3}$

C) ○ $188\sqrt{3}$

D) ○ $164\sqrt{3}$

6.

If x is a positive quantity such that $2^x = 3^{\log_5 2}$, then x is equal to

A) ○ $1 + \log_3 \dfrac{5}{3}$

B) ○ $\log_s 9$

C) ○ $\log_s 8$

D) ○ $1 + \log_s \dfrac{3}{5}$

7. 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) 20
B) 22
C) 16
D) 26

8. 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) 1/4
D) 1/5

9. 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) 16
B) 20
C) 18
D) 22

10. 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) 17 : 25
B) 21 : 25
C) 18 : 25
D) 19 : 24

11. 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) 26
B) 27
C) 28
D) 25

12.

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) $\left(\frac{\pi}{4}\right)^{\frac{1}{2}}$

B) $\left(\frac{\pi}{3\sqrt{3}}\right)^{\frac{1}{2}}$

C) $\left(\frac{\pi}{6}\right)^{\frac{1}{2}}$

D) $\left(\frac{\pi}{4\sqrt{3}}\right)^{\frac{1}{2}}$

13. 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

14. 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, 9
   B) 24, 12
   C) 24, 10
   D) 25, 10

15. 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) 32√3

B) 18√3

C) 24√3

D) 12√3

16.

$\Rightarrow x^{2018} y^{2017} = 1/2$ ----(1)

$\Rightarrow x^{2016} y^{2019} = 8$ ----- (2)

Dividing (1) by (2)

$\Rightarrow x^2/y^2 = 1/16$

$\Rightarrow y = 4x$

Putting value of x in (1), we get

$\Rightarrow (y/4)^{2018} y^{2017} = 1/2$

$\Rightarrow y^{2035} = 2^{2035}$

$\Rightarrow y = 2$

$\Rightarrow x = 2 \times 1/4 = 1/2$

$\therefore ? = x^2 + y^3 = 1/4 + 8 = 33/4$

   A) ○ 33/4
   B) ○ 37/4
   C) ○ 35/4
   D) ○ 31/4

17. DIRECTION for the question: Solve the following question and mark the best possible option.

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) $243 \leq N \leq 252$

B) $N \geq 253$

C) $201 \leq N \leq 242$

D) $N \leq 200$

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

19. 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

20. 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 installments, the first after one year and the second after another year. The first installment 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 installment, in Rs., is

21. 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

22. 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?

23. 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 $\pi = 22/7$, the volume, in cubic ft, of the remaining part of the cone is

24.

If $\log_{12} 81 = p$, then $3\left(\dfrac{4-p}{4+p}\right)$ is equal to

A) ○ $\log_2 8$

B) ○ $\log_4 16$

C) ○ $\log_6 8$

D) ○ $\log_6 16$

25. 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) 86
B) 96
C) 84
D) 98

26. 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

27. 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

28. 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) 6
C) 4
D) 3

29. In a circle, two parallel chords on the same side of a 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) $\sqrt{13}$

B) $\sqrt{14}$

C) $\sqrt{11}$

D) $\sqrt{12}$

30. If among 200 students, 105 like pizza and 134 like burger, then the number of students who like only burger can possibly be
    A) 93
    B) 26
    C) 96
    D) 23

31. 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?

32. If $u^2 + (u-2v-1)^2 = -4v(u + v)$, then what is the value of $u + 3v$?
    A) 0
    B) -1/4
    C) 1/4
    D) ½

33. If $\log_2(5 + \log_3 a) = 3$ and $\log_5(4a + 12 + \log_2 b) = 3$, then $a + b$ is equal to
    A) 40
    B) 67
    C) 59
    D) 32

34. 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
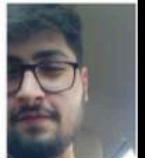
1 out of every 15 students scored 99%ile. Learn with India's most trusted online and offline coaching. Quantifiers CAT Academy

Amartya 99.91	Anik 99.83	Aman 99.83	Ritvik 99.7	Ishan 99.65
Amol 99.63	Harshit 99.59	Siddharth 99.52	Shashank 99.48	Shabbir 99.45
Kshitij 99.44	Animesh 99.41	Priyanshu 99.34	Mridul 99.34	Mohnish 99.32
Abheet 99.18	Rohan 99.10	Manshul 99.01	SAYANTAN 98.87	Swarnima 98.60

Book a free demo Session

Quantifiers.in / @Quantifiers_cat / 9988656560, 7986961408

Solutions

VARC

1. Correct Answer: C

Refer to lines from first paragraph, "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.". so option 3 is the appropriate answer.

2. Correct Answer: A

Bradshaw says that elephants also feel the trauma of loss of loved ones just like human-beings ; thus he would prefer a trauma-treatment for them as is mentioned in option A.
Option B can be ruled out as the main argument of Bradshaw is based on trauma and this study has no direct relationship with trauma.
Option C is rejected as research regarding human-elephant similarity has already been supported by Bradshaw.
Option D is against what Bradshaw intends to counter.

3. Correct Answer: C

The passage talks about growing frequency of aggression between humans and elephants and the author also mentions about traumatic stress that happens among the elephants as it happens among human-beings under similar conditions. All these points get focus in option C.

Option A is incorrect as it doesn't mention anything about the outcome of similarity in brain organization of elephants and human-beings.
Option B just mentions only a part of the passage not in totality, so rejected.
Option D is unrelated as regards the contents of the passage.

4. Correct Answer: B

option 1 can be inferred from para 2

option 4 can be inferred from "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"

option 3 is from ""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.""

5. Correct Answer: A

Fabric of the society means social customs, practices, habits, rituals, etiquette, protocols, and similar interactions comprise the core behavior of a particular society (the paragraph mentions elephant community).

The paragraph line, "the fabric ---------------different habitats" has been used by the author as a metaphor (is a word or phrase used to compare two unlike objects, ideas, thoughts or feelings to provide a clearer description)to indicate the altercation among elephants that has resulted in their loss of habitat due to human intrusion. This idea has been highligted clearly in option A.

6. Correct Answer: B

This is critical reasoning based wherein it is required to negate (weaken) the main message(argument) i.e. natural selection and inheritance cannot define attaining of acquired characteristics by next generation. Option B would negate the main idea as author has mentioned: " 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. . . ."

All other given options actually support the main message.

7. Correct Answer: D

Refer to lines in 2nd and 3rd paragraph," The traditional, and still dominant, view is that adaptations . . . .ecological legacies and culture they bequeath. "These lines give a description about how genes struggling to control human culture reflect the pathway of evolution and different factors like, genomics(genetics), epigenetics, developmental factors and ecological legacies influence the path of evolution which is appropriately highlighted in option D.

Other given options do not present all the afore said factors, so are rejected.

8. Correct Answer: C

Entire passage talks about inheritance of the acquired characteristics. Refer first paragraph" generations of school children-----is impossible. "Therefore , option C is thr most appropriate.

9. Correct Answer: C

Option C is correct as per the explanation given in the passage. The second paragraph speaks about the supposed dominance of Darwin and Mendel's theory of inheritance. But towards the third and susequent paragraphs the author mentions that Wilson's theory was able to explain how acquired traits are inherited in a better way as compared to Darwin and Mendel and this has been highlighted only in option C.

10. Correct Answer: B

Refer to lines in 2nd paragraph, "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".
The same is highlighted in option B make it the best choice.
Option A does not clarify misplaced priporities.
Option C is incorrect as it is nowhere mentioned about the inclusion of their names in India Gate memorial
Option D does not find reference in the passage.

11. Correct Answer: D
Refer to 1st paragraph last line, "India's contribution to the Second World War is airbrushed out of existence".
This implies that the author feels down-hearted about such disregard. This makes option D being the appropriate choice.
Option A is incorrect as the author is not sad about how many lives were lost but they were left unrecognised.
Option B is incorrect as author is not having any problem with new war memorial, so no question of lamenting.
Option C is again incorrect as he has nowhere mentioned about the wastage of money.

12. Correct Answer: A
Refer to lines in 2nd paragraph, "Further, the political trajectory ------------ wartime experiences."
This suggests that India was primarily interested in self-legitimization(to make oneself acceptable). Therefore option A is correct which clearly emphasises the same.
The remaining options are false as per the content of the passage.

13. Correct Answer: B
The phrase "mood music " as used in 2nd paragraph is just indicating the backdrop; whereas struggle for independence was the main theme of "drama".
This is depicted in option B which makes it the correct choice.
Option A is rejected because it is not mentioned in the passage.
Option Cis incorrect because India- Pakistan rivalry was not in focus at the time of Second World War.
Option D is irrelevant .

14. Correct Answer: A
For option B, refer 2nd paragraph" 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."

For option D refer 4th paragraph, "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."

For option C , refer 6th paragraph," 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.

As per 5th paragraph," 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." option A is incorrect statement .

15. Correct Answer: B
Refer to second last paragraph, "Its mission is/was to educate and encourage environmental public. . . . while simultaneously becoming a trusted name in the environmental movement. "This indicates that the efforts maintained had actually shadowed real problem. So, option B properly depicts this and is correct choice.

16. Correct Answer: D
Refer to 3rd paragraph of passage that depict all the options A,B and C except D

17. Correct Answer: B
Option B can be clearly inferred from last paragraph of the passage " 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."

18. Correct Answer: D
Refer to the last line of first paragraph where "lie" implies the that the burden of plastic pollution has been put on the consumers. So, option D is appropriate.

19. Correct Answer: D
Througout the whole passage the author believes that the bigger problem is the production itself,that is causing plastic pollution rather than focusing on consumer behavior which is just a minor part of the giant problem like plastic pollution.

So option D explains the phrase "what hammering a nail is to halting a falling skyscraper" properly.

20. Correct Answer: A

Refer 1st paragraph and also by going through the passage as a whole the author seems to emphasise that economists should incorporate psychological aspect, certain emotions in their research making option A as an appropriate choice. Others don't fit the bill.

21. Correct Answer: D
Refer to lines from last paragraph " Since the 1970s, depression has come to be viewed as a cognitive ------------ failure when things go badly", we can derive author's opinion which has been aptly depicted in option D

22. Correct Answer: C
Throughout the passage the author is emphasising on incorporating psychological aspects in research findings by economists. Only option C goes against author's main argument

23. Correct Answer: D
Refer to the second last paragraph of the passage "As the science grows more sophisticated ----------------basis to transform or discipline individuals." It implies that option D is the best choice.

24. Correct Answer: C
refer to para 4

25. Correct Answer: C
Option C comprehensively sumarises the entire paragraph
Option A talks about development and not formation of identical twins , hence rejected.
Option B is lacking important point of genetic similarity, hence rejected.
Option D is wrong as it suggests formation of twins "during fertilization", it is actually "one day after fertilization"

26. Correct Answer: 2
The paragraph opens with the subject in question which is given in line 1."Translators are like bumblebees.

Then we move further putting a chronological order(present-past).In 1934, the French entomologist August Magnan pronounced the flight of the bumblebee to be aerodynamically impossible, and though long since scientifically disproved, this factoid is still routinely trotted out. Similar pronouncements about the impossibility of translation have dogged practitioners since Leonardo Bruni's De interpretation recta, published in 1424. Meanwhile, bees, unaware of these deliberations, have continued to flit from flower to flower, and translators continue to translate."

Apart from option 2 rest of the options form a coherent paragraph

27. Correct Answer: 1432

Line 1 introduces the noun, Line 4 introduces "swifts" and thought is continued in line 3.
so correct order is 1432

28. Correct Answer: 4
correct order is 1325, passage talks about immunization and inconsistency, it does not concern with cost so line 4 is the odd one out

29. Correct Answer: 4213
Line 4 introduces noun, Line 2 furthers information about it, Line 3 talks about the diagnosis and 4 talks about how far it had spread. So correct order is 4213.

30. Correct Answer: 1
Statement 3 opens the paragraph as it is a generic statement. Statement 2 follows 3 as it gives reasons for the erosion of Ganges. Statement 4 follows 2 due to keyword "erosion" and statement 5 concludes the paragraph. So statement 1 is the odd one which is actually contrary to the views expressed in the paragraph.

31. Correct Answer: 1324
Line 1 introduces the two main subjects, Line 2 will follow Line3 as it is a mandatory pair (noun 'twitter'-pronoun' it'), Line 2 continues what is mentioned in Line 3. and 4 will be the concluding sentence expressing how Twitter poses as an example to what has been mentioned in line 1. So the correct order is 1324.

32. Correct Answer: B
Option A is incorrect as the artists only facilitated the understanding of the subject-matter, they were not responsible for the study of landscape as a subject of art.
Option B is the best option amongst all
Option C is incorrect because landscape was not major but became an independent subject.
Option D changes the focus of the paragraph from landscape to organism

33. Correct Answer: 2413
Sentence 2 is the perfect opening statement as it mentions the subject matter of the paragraph. Sentence 4 furthers the thought stated in sentence 2. Sentence1 follows 4 that introduces unwitting enablers who contribute the incompatibility and the paragraph concludes with sentence 3. The correct arrangement is 2413.

34. Correct Answer: A
as author states that "Power is understood as a negative mechanism, which prevents the non-professional actors from offering their ideas and information as legitimate knowledge. " It basically restricts knowledge to the ones in power.

DILR

1. **Correct Answer: 4**

Given that n × n square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Also, two cells are called adjacent if they touch each other horizontally, vertically or diagonally.

As per the given information, in the following matrix, the cells adjacent to A_{11} are A_{12}, A_{21} and A_{22} i.e. 3 adjacent cells for corner cell and $A_{11}, A_{21}, A_{22}, A_{23}, A_{13}$ are adjacent to A_{12}

A_{11}	A_{12}	A_{13}
A_{21}	A_{22}	A_{23}
A_{31}	A_{32}	A_{33}

For minimum number of different numerals, to fill 3 x 3 matrix, we can fill the matrix in following manner, if we put 1 in $A_{11}, A_{31}, A_{13}, A_{33}$, then 1 cannot be put in any other cell. Again now put 2 in A_{12} and A_{32}, so 2 cannot be put anywhere else. Similarly put 3 in A_{21} and A_{23} and put 4 in A_{22}

1	2	1
3	4	3
1	2	1

So, we require minimum 4 different numerals to fill 3 x 3 square matrix.

2. **Correct Answer: 4**

Given that n × n square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Also, two cells are called adjacent if they touch each other horizontally, vertically or diagonally.

As per the given information, in the following matrix, the cells adjacent to A_{11} are A_{12}, A_{21} and A_{22} i.e. 3 adjacent cells for corner cell and $A_{11}, A_{21}, A_{22}, A_{23}, A_{13}$ are adjacent to A_{12}

A_{11}	A_{12}	A_{13}
A_{21}	A_{22}	A_{23}
A_{31}	A_{32}	A_{33}

For minimum number of different numerals to fill 5 x 5 square matrix, we can fill 1 in $A_{11}, A_{13}, A_{15}, A_{31}, A_{33}, A_{35}, A_{51}, A_{53}, A_{55}$, then 1 cannot be placed in any other cell. Again if we put 2 in $A_{12}, A_{14}, A_{32}, A_{34}, A_{52}, A_{54}$, then 2 cannot be place in any other cell. Similarly if we put 3 in $A_{22}, A_{24}, A_{42}, A_{44}$ then 3 cannot be placed in any other cell, now we can put 4 in remaining places ($A_{21}, A_{23}, A_{25}, A_{41}, A_{43}, A_{45}$)

1	2	1	2	1
4	3	4	3	4
1	2	1	2	1
4	3	4	3	4
1	2	1	2	1

So, we require minimum 4 different elements to fill 5 x 5 square matrix.

3. **Correct Answer: C**

Given that n × n square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Also, two cells are called adjacent if they touch each other horizontally, vertically or diagonally.

As per the given information, in the following matrix, the cells adjacent to A_{11} are A_{12}, A_{21} and A_{22} i.e. 3 adjacent cells for corner cell and $A_{11}, A_{21}, A_{22}, A_{23}, A_{13}$ are adjacent to A_{12}

A_{11}	A_{12}	A_{13}
A_{21}	A_{22}	A_{23}
A_{31}	A_{32}	A_{33}

As one mistake is allowed therefore let 1 be placed in cell A_{12} , we can easily see that even after one mistake we need minimum of 4 different numerals to fill 5 x 5 square matrix .

1	1	1	2	1
4	3	4	3	4
1	2	1	2	1
4	3	4	3	4
1	2	1	2	1

4. Correct Answer: C

Given that n × n square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Also, two cells are called adjacent if they touch each other horizontally, vertically or diagonally.

As per the given information, in the following matrix, the cells adjacent to A_{11} are A_{12}, A_{21} and A_{22} i.e. 3 adjacent cells for corner cell and $A_{11}, A_{21}, A_{22}, A_{23}, A_{13}$ are adjacent to A_{12}

A_{11}	A_{12}	A_{13}
A_{21}	A_{22}	A_{23}
A_{31}	A_{32}	A_{33}

Given that all the cells adjacent to any particular cell must have different numerals, so let us put 1 in A_{33} , now put 2,3,4,5,6,7,8,9 respectively in A_{23} , A_{22} , A_{32} , A_{42} , A_{43} , A_{44} , A_{34} , A_{24} ,in this way all the cells adjacent to A_{33} have different numerals , Now we can put 1 in A_{11} , A_{13} , A_{15} , A_{31} , A_{35} , A_{51} , A_{53} , A_{55} and 5 in A_{12} , A_{14} , 2 in A_{52} , A_{54} , 8 in A_{21} and A_{41} , 3 in A_{25} and A_{45} ,in this way matrix can be filled . So minimum 9 different numerals are needed to fill a 5x 5 square matrix in required way.

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

5. Correct Answer: A

Jatin and Indu scored 100% in exactly one section, So Jatin must have scored 20 in DI.

Composite score of Jatin = 20(2) + 16 + 14 = 70 and he will be recruited as he scores more than Indu and it is given that Indu is recruited.

Indu's score will be 70 − 10 = 60. Indu scored 100% in exactly one section but that cannot be DI because If Indu scores 20 in DI, Indus's score in GA = 60 − 40 − 8 = 12

In this case, Indu will not qualify as she will have two sections with less than 70%.

So she must have scored 20 in GA

Indu's score in DI= (60 - 20-8)/2= 16

So Danish, Harini and Indu scored 20 in GA

Score of Danish is 2(8) + 15 + 20 = 51

Hence, Score of Ajay is 2(8) + 20 + 16 = 52 because Ajay is unique highest scorer in WE section, so he must have scored 19 or 20 but 19 is not possible because in that case composite score of Ajay would also become 51, which is not possible.

Chetna's composite score = 19(2) + 4 + 12 = 54 but she is not recruited as she scored less than 70% in two sections.

Ester's composite score = 12(2) + 18 + 16 = 58 so Ester also is recruited.

Geeta is recruited with lowest composite score, So she must have scored more than Ajay.

Maximum possible composite score of Geeta can be 54, but 54 is not possible.

So Geeta's composite score= 14(2) + 19 + 6 = 53

	DI	WE	GA	SCORE
A	8	20	16	52
B		9	11	
C	19	4	12	54
D	8	15	20	51
E	12	18	16	58
F	15	7	10	47
G	14	19	6	53
H	5		20	
I	16	8	20	60
J	20	16	14	70

(Jatin's composite score was more than that of Danish) and (Indu scored less than Chetan in DI).

6. **Correct Answer: D**

Jatin and Indu scored 100% in exactly one section, So Jatin must have scored 20 in DI.

Composite score of Jatin = 20(2) + 16 + 14 = 70 and he will be recruited as he scores more than Indu and it is given that Indu is recruited.

Indu's score will be 70 − 10 = 60. Indu scored 100% in exactly one section but that cannot be DI because If Indu scores 20 in DI, Indus's score in GA = 60 − 40 − 8 = 12

In this case, Indu will not qualify as she will have two sections with less than 70%.

So she must have scored 20 in GA

Indu's score in DI= (60 - 20-8)/2= 16

So Danish, Harini and Indu scored 20 in GA

Score of Danish is 2(8) + 15 + 20 = 51

Hence, Score of Ajay is 2(8) + 20 + 16 = 52 because Ajay is unique highest scorer in WE section, so he must have scored 19 or 20 but 19 is not possible because in that case composite score of Ajay would also become 51, which is not possible.

Chetna's composite score = 19(2) + 4 + 12 = 54 but she is not recruited as she scored less than 70% in two sections.

Ester's composite score = 12(2) + 18 + 16 = 58 so Ester also is recruited.

Geeta is recruited with lowest composite score, So she must have scored more than Ajay.

Maximum possible composite score of Geeta can be 54, but 54 is not possible.

So Geeta's composite score= 14(2) + 19 + 6 = 53

	DI	WE	GA	SCORE
A	8	20	16	52
B		9	11	
C	19	4	12	54
D	8	15	20	51
E	12	18	16	58
F	15	7	10	47
G	14	19	6	53
H	5		20	
I	16	8	20	60
J	20	16	14	70

Bala scored same as Jatin in DI must be false because if Bala scores 20 in DI then composite score of Bala will be = 20(2)+9+11= 60 which will be same as that of Indu.

7. Correct Answer: 13

Jatin and Indu scored 100% in exactly one section, So Jatin must have scored 20 in DI.
Composite score of Jatin = 20(2) + 16 + 14 = 70 and he will be recruited as he scores more than Indu and it is given that Indu is recruited.
Indu's score will be 70 – 10 = 60. Indu scored 100% in exactly one section but that cannot be DI because If Indu scores 20 in DI, Indus's score in GA = 60 – 40 – 8 = 12
In this case, Indu will not qualify as she will have two sections with less than 70%.
So she must have scored 20 in GA
Indu's score in DI= (60 - 20-8)/2= 16
So Danish, Harini and Indu scored 20 in GA
Score of Danish is 2(8) + 15 + 20 = 51
Hence, Score of Ajay is 2(8) + 20 + 16 = 52 because Ajay is unique highest scorer in WE section, so he must have scored 19 or 20 but 19 is not possible because in that case composite score of Ajay would also become 51, which is not possible.
Chetna's composite score = 19(2) + 4 + 12 = 54 but she is not recruited as she scored less than 70% in two sections.
Ester's composite score = 12(2) + 18 + 16 = 58 so Ester also is recruited.
Geeta is recruited with lowest composite score, So she must have scored more than Ajay.
Maximum possible composite score of Geeta can be 54, but 54 is not possible.
So Geeta's composite score= 14(2) + 19 + 6 = 53

	DI	WE	GA	SCORE
A	8	20	16	52
B		9	11	
C	19	4	12	54
D	8	15	20	51
E	12	18	16	58
F	15	7	10	47
G	14	19	6	53
H	5		20	
I	16	8	20	60
J	20	16	14	70

Bala cannot score 20 or 19 as they are already scored by Jatin and Chetna. If Bala scores 18 in DI then his composite score will be 56 which is more than that of Chetna. So it is not possible. If he scores 17 then his composite score will be 54 which is equal to Chetna's score. So it is again not possible. Next he cannot score 16 or 15. If he scores 13 then his composite score will be 46 which is possible.

8. Correct Answer: 14

Jatin and Indu scored 100% in exactly one section, So Jatin must have scored 20 in DI.

Composite score of Jatin = 20(2) + 16 + 14 = 70 and he will be recruited as he scores more than Indu and it is given that Indu is recruited.

Indu's score will be 70 – 10 = 60. Indu scored 100% in exactly one section but that cannot be DI because If Indu scores 20 in DI, Indus's score in GA = 60 – 40 – 8 = 12

In this case, Indu will not qualify as she will have two sections with less than 70%.

So she must have scored 20 in GA

Indu's score in DI= (60 - 20-8)/2= 16

So Danish, Harini and Indu scored 20 in GA

Score of Danish is 2(8) + 15 + 20 = 51

Hence, Score of Ajay is 2(8) + 20 + 16 = 52 because Ajay is unique highest scorer in WE section, so he must have scored 19 or 20 but 19 is not possible because in that case composite score of Ajay would also become 51, which is not possible.

Chetna's composite score = 19(2) + 4 + 12 = 54 but she is not recruited as she scored less than 70% in two sections.

Ester's composite score = 12(2) + 18 + 16 = 58 so Ester also is recruited.

Geeta is recruited with lowest composite score, So she must have scored more than Ajay.

Maximum possible composite score of Geeta can be 54, but 54 is not possible.

So Geeta's composite score= 14(2) + 19 + 6 = 53

	DI	WE	GA	SCORE
A	8	20	16	52
B		9	11	
C	19	4	12	54
D	8	15	20	51
E	12	18	16	58
F	15	7	10	47
G	14	19	6	53
H	5		20	
I	16	8	20	60
J	20	16	14	70

Harini cannot score 20, 19 and 18. If she scores 17 then her score will be 47 which is equal to Falak's score. Next she cannot score 16 and 15. If she scores 14 then her composite score will be 44 which is possible.

9. Correct Answer: D

It is given that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression.

So 40 + (40 + x) + (40 + 2x) = 150

x = 10

April 2016 = 40

May 2016 = 50

June 2016 = 60

Also, the same case holds for October, November, December of 2016.

100 + (100 + x) ++ (100 + 2x) = 360

x = 20

October 2016 = 100

November 2016 = 120

December 2016 = 140

In case of December 2017,

The total aggregate for the last quarter is 2017 is 500.

October + November + December = 500

150 + 170 + Dec =500

Dec = 500 – 320 = 180.

	2016			2017	
Quarter	Month	Sales Figures	Quarter	Month	Sales Figures
Q₁(240)	January	80	Q₁(380)	January	120
	February	60		February	100
	March	100		March	160
Q₂(150)	April	40	Q₂(200)	April	60
	May	50		May	75
	June	60		June	65
Q₃(250)	July	75	Q₃(220)	July	60
	August	120		August	90
	September	55		September	70
Q₄(360)	October	100	Q₄(500)	October	150
	November	120		November	170
	December	140		December	180

Sales in December 2017 = 180
Sales in December 2016 = 140
Percentage increase $= \dfrac{40}{140} \times 100 = 28.57\%$

10. Correct Answer: B

It is given that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression.

So 40 + (40 + x) + (40 + 2x) = 150

x = 10

April 2016 = 40

May 2016 = 50

June 2016 = 60

Also, the same case holds for October, November, December of 2016.

$100 + (100 + x) ++ (100 + 2x) = 360$

$x = 20$

October 2016 = 100

November 2016 = 120

December 2016 = 140

In case of December 2017,

The total aggregate for the last quarter is 2017 is 500.

October + November + December = 500

150 + 170 + Dec =500

Dec = 500 – 320 = 180.

2016			2017		
Quarter	Month	Sales Figures	Quarter	Month	Sales Figures
Q_1(240)	January	80	Q_1(380)	January	120
	February	60		February	100
	March	100		March	160
Q_2(150)	April	40	Q_2(200)	April	60
	May	50		May	75
	June	60		June	65
Q_3(250)	July	75	Q_3(220)	July	60
	August	120		August	90
	September	55		September	70
Q_4(360)	October	100	Q_4(500)	October	150
	November	120		November	170
	December	140		December	180

	2017	2016	percentage increase
Q1	380	240	$\frac{140}{240} \times 100 = 58.33$
Q2	200	150	$\frac{50}{150} \times 100 = 33.33$
Q3	220	250	$\frac{-30}{250} \times 100 = -12\%$
Q4	500	360	$\frac{140}{360} \times 100 = 38.88\%$

So the percentage increase in the sales is highest for Q1.

11. Correct Answer: A

It is given that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression.

44

So 40 + (40 + x) + (40 + 2x) = 150

x = 10

April 2016 = 40

May 2016 = 50

June 2016 = 60

Also, the same case holds for October, November, December of 2016.

100 + (100 + x) ++ (100 + 2x) = 360

x = 20

October 2016 = 100

November 2016 = 120

December 2016 = 140

In case of December 2017,

The total aggregate for the last quarter is 2017 is 500.

October + November + December = 500

150 + 170 + Dec =500

Dec = 500 – 320 = 180.

2016			2017		
Quarter	Month	Sales Figures	Quarter	Month	Sales Figures
Q_1(240)	January	80	Q_1(380)	January	120
	February	60		February	100
	March	100		March	160
Q_2(150)	April	40	Q_2(200)	April	60
	May	50		May	75
	June	60		June	65
Q_3(250)	July	75	Q_3(220)	July	60
	August	120		August	90
	September	55		September	70
Q_4(360)	October	100	Q_4(500)	October	150
	November	120		November	170
	December	140		December	180

Q2 of 2017 with compared with Q1 of 2017
= (200-380)/380 × 100 = - 47.36 or 47.36% decrease
Q_1 of 2017 compared with Q_4 of 2016.
= (380 − 360)/360 × 100 = 5.55% increase.
Q_2 of 2016 compared with Q_1 of 2016
= (150-240)/240 × 100 = −37.5% increase or 37.5% decrease
Q_4 of 2017 with compared with Q_3 of 2017
There is an increase from 220 to 500.

So, sales of Q_2 of 2017, had the highest percentage decrease compared with Q_1 of 2017.

12. Correct Answer: A

It is given that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression.

So 40 + (40 + x) + (40 + 2x) = 150

x = 10

April 2016 = 40

May 2016 = 50

June 2016 = 60

Also, the same case holds for October, November, December of 2016.

100 + (100 + x) ++ (100 + 2x) = 360

x = 20

October 2016 = 100

November 2016 = 120

December 2016 = 140

In case of December 2017,

The total aggregate for the last quarter is 2017 is 500.

46

October + November + December = 500

150 + 170 + Dec =500

Dec = 500 – 320 = 180.

	2016			2017	
Quarter	Month	Sales Figures	Quarter	Month	Sales Figures
Q_1(240)	January	80	Q_1(380)	January	120
	February	60		February	100
	March	100		March	160
Q_2(150)	April	40	Q_2(200)	April	60
	May	50		May	75
	June	60		June	65
Q_3(250)	July	75	Q_3(220)	July	60
	August	120		August	90
	September	55		September	70
Q_4(360)	October	100	Q_4(500)	October	150
	November	120		November	170
	December	140		December	180

(1) March 2017,   Feb 2017
        160   100 $= \dfrac{60}{100} \times 100 = 60\%$ increase.

(2) March 2016,   Feb 2016
        100   60 $= \dfrac{40}{60} \times 100 = 66.66\%$ increase.

(3) October 2016,   September 2016
        100   55 $= \dfrac{45}{55} \times 100 = 81.81\%$ increase

(4) October 2017,   September 2017
        150   70 $= \dfrac{80}{70} \times 100 = 114.2\%$ increase.

∴ The highest percentage increase in this case is from September 2017 to October 2017.

13. Correct Answer: A

To start of this question, lets analyze each statement individually.

S1 : Out of first 5 pipes, there are 3 H. So remaining two will be M or L.

S2 : Out of first 10 pipes, there is only 1 L.

Combining the above 2, it is clear that out of first 5, there will be 3 H and 2 M.

S3 : P7 and P8 both recorded HH/MM and other than these two, there are no other consecutive pipes of same type.

S4 : P16 to P20 there are no H. Also we can think, that since we cannot have consecutive pipes of same type, so out of these 5 there have to 3M + 2L OR 3L + 2M.

S5 : H = 2L which means that H has to be an even number.

Lets fill the values P1 to P20 with all possible combinations clear till now.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C1	H	M	H	M	H	L	H	H	M	H						M	L	M	L	M
C2	H	M	H	M	H	L	M	M	H	M						M	L	M	L	M
C3	H	M	H	M	H	L	H	H	M	H						L	M	L	M	L
C4	H	M	H	M	H	L	M	M	H	M						L	M	L	M	L

Considering C2.

C2 has 4H, 3L already. As per condition S5, H can either be 6 or 8. If we take H as 6, then L will be 3. See C2 carefully, it already has 3 L's. This means that P11 to P15 will have 2H and 3M which can happen only if P11 is M. This is not possible since P10 and P11 will get same values which is not allowed.

If we take H as 8, then we need 4H from P11 to P15 which again is not possible. So C2 is rejected completely.

Considering C4.

C4 has 4H, 4L already. As per S5, even if we keep L at 4, we need total 8H, which means 4H are required from P11 to P15 which again is not possible. So C4 is also rejected.

Considering C1.

It has 6H, 3L already. So we need to add more H, L to this otherwise P11 to P15 will be all M, which is not allowed. So next possible value is 4L,8H. Infact this is the only possible combination, because if we go higher to 5L,10H then total will go beyond 20 considering already existing 6M. Continuing with 4L, 8H we see that from P11 to P15 we need 1L, 2H, 2M.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C1	H	M	H	M	H	L	H	H	M	H		M	H		M	H	L		M	L		M	L		M
	H	M	H	M	H	L	H	H	M	H		M	H		M	L		H		M	L		M	L		M
	H	M	H	M	H	L	H	H	M	H		M	H	L		M	H		M	L		M	L		M
	H	M	H	M	H	L	H	H	M	H	L		M	H		M	H		M	L		M	L		M

Similarly considering C3, there are 6H, 4L, 5M. So to match condition S5, we need total 8H, 4L, 8M which means that there should be 2H, 3M from P11 to P15.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C3	H	M	H	M	H	L	H	H	M	H		M	H		M	H		M	L		M	L		M	L

Another possibility is we can have final 10H, 5L, 5M, already present are 6H, 4L, 5M which means we need 4H and 1L from P11 to P15 which is clearly rejected because this would result in consecutive H's.

So total 5 cases are possible.

Out of all 5 possible cases, all have H on P10. So option 1 has to be true.

14. Correct Answer: D
To start of this question, lets analyze each statement individually.

S1 : Out of first 5 pipes, there are 3 H. So remaining two will be M or L.

S2 : Out of first 10 pipes, there is only 1 L.

Combining the above 2, it is clear that out of first 5, there will be 3 H and 2 M.

S3 : P7 and P8 both recorded HH/MM and other than these two, there are no other consecutive pipes of same type.

S4 : P16 to P20 there are no H. Also we can think, that since we cannot have consecutive pipes of same type, so out of these 5 there have to 3M + 2L OR 3L + 2M.

S5 : H = 2L which means that H has to be an even number.

Lets fill the values P1 to P20 with all possible combinations clear till now.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C1	H	M	H	M	H	L	H	H	M	H						M	L	M	L	M
C2	H	M	H	M	H	L	M	M	H	M						M	L	M	L	M
C3	H	M	H	M	H	L	H	H	M	H						L	M	L	M	L
C4	H	M	H	M	H	L	M	M	H	M						L	M	L	M	L

Considering C2.

C2 has 4H, 3L already. As per condition S5, H can either be 6 or 8. If we take H as 6, then L will be 3. See C2 carefully, it already has 3 L's. This means that P11 to P15 will have 2H and 3M which can happen only if P11 is M. This is not possible since P10 and P11 will get same values which is not allowed.

If we take H as 8, then we need 4H from P11 to P15 which again is not possible. So C2 is rejected completely.

Considering C4.

C4 has 4H, 4L already. As per S5, even if we keep L at 4, we need total 8H, which means 4H are required from P11 to P15 which again is not possible. So C4 is also rejected.

Considering C1.

It has 6H, 3L already. So we need to add more H, L to this otherwise P11 to P15 will be all M, which is not allowed. So next possible value is 4L,8H. Infact this is the only possible combination, because if we go higher to 5L,10H then total will go beyond 20 considering already existing 6M. Continuing with 4L, 8H we see that from P11 to P15 we need 1L, 2H, 2M.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C1	H	M	H	M	H	L	H	H	M	H	M	H	M	H	L	M	L	M	L	M
	H	M	H	M	H	L	H	H	M	H	M	H	M	L	H	M	L	M	L	M
	H	M	H	M	H	L	H	H	M	H	M	H	L	M	H	M	L	M	L	M
	H	M	H	M	H	L	H	H	M	H	L	M	H	M	H	M	L	M	L	M

Similarly considering C3, there are 6H, 4L, 5M. So to match condition S5, we need total 8H, 4L, 8M which means that there should be 2H, 3M from P11 to P15.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C3	H	M	H	M	H	L	H	H	M	H	M	H	M	H	M	L	M	L	M	L

Another possibility is we can have final 10H, 5L, 5M, already present are 6H, 4L, 5M which means we need 4H and 1L from P11 to P15 which is clearly rejected because this would result in consecutive H's.

So total 5 cases are possible.

All the possible cases have exactly 8 M's. So option 4.

15. Correct Answer: D

To start of this question, lets analyze each statement individually.

S1 : Out of first 5 pipes, there are 3 H. So remaining two will be M or L.

S2 : Out of first 10 pipes, there is only 1 L.

Combining the above 2, it is clear that out of first 5, there will be 3 H and 2 M.

S3 : P7 and P8 both recorded HH/MM and other than these two, there are no other consecutive pipes of same type.

S4 : P16 to P20 there are no H. Also we can think, that since we cannot have consecutive pipes of same type, so out of these 5 there have to 3M + 2L OR 3L + 2M.

S5 : H = 2L which means that H has to be an even number.

Lets fill the values P1 to P20 with all possible combinations clear till now.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C1	H	M	H	M	H	L	H	H	M	H						M	L	M	L	M
C2	H	M	H	M	H	L	M	M	H	M						M	L	M	L	M
C3	H	M	H	M	H	L	H	H	M	H						L	M	L	M	L
C4	H	M	H	M	H	L	M	M	H	M						L	M	L	M	L

Considering C2.

C2 has 4H, 3L already. As per condition S5, H can either be 6 or 8. If we take H as 6, then L will be 3. See C2 carefully, it already has 3 L's. This means that P11 to P15 will have 2H and 3M which can happen only if P11 is M. This is not possible since P10 and P11 will get same values which is not allowed.

If we take H as 8, then we need 4H from P11 to P15 which again is not possible. So C2 is rejected completely.

Considering C4.

C4 has 4H, 4L already. As per S5, even if we keep L at 4, we need total 8H, which means 4H are required from P11 to P15 which again is not possible. So C4 is also rejected.

Considering C1.

It has 6H, 3L already. So we need to add more H, L to this otherwise P11 to P15 will be all M, which is not allowed. So next possible value is 4L,8H. Infact this is the only possible combination, because if we go higher to 5L,10H then total will go beyond 20 considering already existing 6M. Continuing with 4L, 8H we see that from P11 to P15 we need 1L, 2H, 2M.

51

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C1	H	M	H	M	H	L	H	H	M	H	M	H	M	H	L	M	L	M	L	M
	H	M	H	M	H	L	H	H	M	H	M	H	M	L	H	M	L	M	L	M
	H	M	H	M	H	L	H	H	M	H	M	H	L	M	H	M	L	M	L	M
	H	M	H	M	H	L	H	H	M	H	L	M	H	M	H	M	L	M	L	M

Similarly considering C3, there are 6H, 4L, 5M. So to match condition S5, we need total 8H, 4L, 8M which means that there should be 2H, 3M from P11 to P15.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C3	H	M	H	M	H	L	H	H	M	H	M	H	M	H	M	L	M	L	M	L

Another possibility is we can have final 10H, 5L, 5M, already present are 6H, 4L, 5M which means we need 4H and 1L from P11 to P15 which is clearly rejected because this would result in consecutive H's.

So total 5 cases are possible.

There is only 1 case where P11 is low. In this arrangement, we have P14 as M. So option 4.

16. Correct Answer: B

To start of this question, lets analyze each statement individually.

S1 : Out of first 5 pipes, there are 3 H. So remaining two will be M or L.

S2 : Out of first 10 pipes, there is only 1 L.

Combining the above 2, it is clear that out of first 5, there will be 3 H and 2 M.

S3 : P7 and P8 both recorded HH/MM and other than these two, there are no other consecutive pipes of same type.

S4 : P16 to P20 there are no H. Also we can think, that since we cannot have consecutive pipes of same type, so out of these 5 there have to 3M + 2L OR 3L + 2M.

S5 : H = 2L which means that H has to be an even number.

Lets fill the values P1 to P20 with all possible combinations clear till now.

Considering C2.

C2 has 4H, 3L already. As per condition S5, H can either be 6 or 8. If we take H as 6, then L will be 3. See C2 carefully, it already has 3 L's. This means that P11 to P15 will have 2H and 3M which can happen only if P11 is M. This is not possible since P10 and P11 will get same values which is not allowed.

If we take H as 8, then we need 4H from P11 to P15 which again is not possible. So C2 is rejected completely.

Considering C4.

C4 has 4H, 4L already. As per S5, even if we keep L at 4, we need total 8H, which means 4H are required from P11 to P15 which again is not possible. So C4 is also rejected.

Considering C1.

It has 6H, 3L already. So we need to add more H, L to this otherwise P11 to P15 will be all M, which is not allowed. So next possible value is 4L,8H. Infact this is the only possible combination, because if we go higher to 5L,10H then total will go beyond 20 considering already existing 6M. Continuing with 4L, 8H we see that from P11 to P15 we need 1L, 2H, 2M.

Similarly considering C3, there are 6H, 4L, 5M. So to match condition S5, we need total 8H, 4L, 8M which means that there should be 2H, 3M from P11 to P15.

Another possibility is we can have final 10H, 5L, 5M, already present are 6H, 4L, 5M which means we need 4H and 1L from P11 to P15 which is clearly rejected because this would result in consecutive H's.

So total 5 cases are possible.

There is only 1 case where P15 is M. In this arrangement, we have P11 and P16 different. So option 2.

17. Correct Answer: A
It is given that the satellites serving either B, C or S do not serve O.

From (1), let the number of satellites serving B, C and S be 2K, K, K respectively.
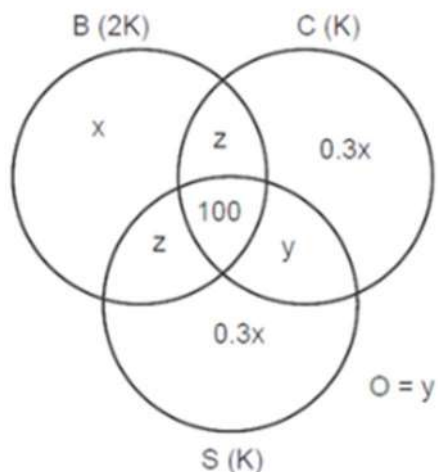
Let the number of satellites exclusively serving B be x.

From (3), the number of satellites exclusively serving C and exclusively serving S will each be 0.3x

From (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

$\Rightarrow x + z + 0.3x + z + 100 + y + 0.3x + y = 1600$

$1.6x + 2y + 2z = 1500$ --------------- (1)

Also $K = 0.3x + z + y + 100$

Satellites serving $B = 2K = x + 2z + 100$

$\Rightarrow 2(0.3x + z + y + 100) = x + 2z + 100$

$0.4x = 2y + 100$

$x = 5y + 250$ -----------(2)

Substituting (2) in (1), we will get

$1.6 (5y + 250) + 2y + 2z = 1500$

$10y + 2z = 1100$

$z = 550 – 5y$ ------------ (3)

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.

∴ The maximum number of satellites serving C will be 725.

From (3), z = 550 – 5y

Since the number of satellites cannot be negative,

z ≥ 0 550 – 5y ≥ 0

y ≤ 110.

∴ Maximum value of y is 110.

When y = 110, the number of satellites serving C will be 725 – 2.5 × 110 = 450. This will be the minimum number of satellites serving C.

The number of satellites serving C must be between 450 and 725.

18. Correct Answer: B
It is given that the satellites serving either B, C or S do not serve O.

From (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 (3), the number of satellites exclusively serving C and exclusively serving S will each be 0.3x

From (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

⇒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

$\Rightarrow$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)

From 2, the number of satellites serving B exclusively is x = 5y + 250

This is minimum when y is minimum.

Minimum value of y = 0.

$\therefore$ The minimum number of satellites serving B exclusively = 5 × 0 + 250 = 250.

19. Correct Answer: D
It is given that the satellites serving either B, C or S do not serve O.

From (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 (3), the number of satellites exclusively serving C and exclusively serving S will each be 0.3x

From (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

$\therefore$ 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

$\Rightarrow$ 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

$\Rightarrow$ 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)

Given that at least 100 satellites serve 0; we can say in this case that y $\geq$ 100.

Number of satellites serving s = 0.3x + z +100 + y. = 725 – 2.5y……..(4)

This is minimum when y is maximum, i.e. 110, (from (3))

Minimum number of satellites serving = 725 – 2.5 × 110 = 450.

(4) is maximum when y is minimum, i.e., 100 in this case.

Maximum number of satellites serving = 725 – 2.5 × 100 = 475

Therefore, the number of satellites serving S is at most 475

20. Correct Answer: D
It is given that the satellites serving either B, C or S do not serve O.

From (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 (3), the number of satellites exclusively serving C and exclusively serving S will each be 0.3x

From (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

$\Rightarrow$ 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

$\Rightarrow$ 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)

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

$1200 - 9y = 1200$

$\Rightarrow y = 0$

If $y = 0$, $x = 5y + 250 = 250$

$z = 550 - 5y = 550$

No. of satellites serving C = K = $z + 0.3x + 100 + y = 550 + 0.3 \times 250 + 100 + 0 = 725$

No. of satellites serving B = 2k = $2 \times 725 = 1450$.

The number of satellites serving B exclusively = $x = 250$

Also the value of $y = 0 \Rightarrow$ All 1600 satellites serve B or C or S.

As the number of satellites serving C can be found uniquely, so option (4) is false.

21. Correct Answer: 7
The ATM dispenses only 500, 200 and 100 notes and since 500 rupee notes is the preference, it has to dispense more 500 rupee notes than the other two notes combined. The following ways are possible:

500 rupee notes	200 rupee notes	100 rupee notes
10	0	0
9	2	1
9	1	3
9	0	5
8	5	0
8	4	2
8	3	4

Hence, a total of seven ways are possible.

22. Correct Answer: 6
Since there are 10 customers. To serve the maximum number of customers with 500 rupee notes as preference, we need to minimize the number of 500 rupee notes that can be served to any customers.

From the above table, minimum number of 500 rupee notes that the ATM can dispense to any person with 500 rupee notes as his/her preference is 8. Hence with fifty 500 rupee notes, a total of 6 persons can be served. Answer is 6.

23. Correct Answer: D

Given fifty 500 rupee notes, we can minimize the number of 500rupee notes dispensed to each customer, so that each customer is served at most 20 notes. For this we have cases as:

i) If no 500 rupee note is dispensed then minimum number of notes that must be dispensed 25 (i.e. all 200 rupee notes). This is not possible (as we need at most 20 notes).

ii) If one 500 rupee note is dispensed, twenty two 200 rupee notes and one 100 rupee note is dispensed then the minimum number of notes dispensed is 24. Again not possible.

iii) If two 500 rupee notes and twenty 200 rupee notes are dispensed, the minimum number of notes is 22. This is not possible.

iv) If three 500 notes, seventeen 200 rupee notes and one 100 rupee note is dispensed, then minimum number of notes dispensed is 21.

v) If four 500 and fifteen 200 rupee notes dispensed, then minimum number of notes dispensed is 19. Hence the minimum number of 500 rupee notes that can be dispensed to any person is 4. Therefore, with fifty 500 rupee notes a maximum of 12 persons can be served.

Hence answer is option 4.

24. Correct Answer: B
To dispense the smallest possible number of notes to a person with 500 rupee notes as his/her preference, the ATM should dispense all 500 rupee notes.

Hence, minimum number of notes required to serve any person with 500 rupee notes as his/her preference = 10 (all of 500 rupees).

Total number of 500 rupee notes required to serve 50 customers with 500 rupee notes as his/her preference = 10 × 50 = 500

To minimize the number of notes to be served to a person with 100 rupee notes as his/her preference, we can maximize the number of 500 rupee notes served to him, keeping the 100 rupee notes more than the sum of the other two denominations.

This is possible if the machine serves eight 500 rupee notes and ten 100 rupee notes.

Hence, the total number of 500 rupee notes required to serve 50 customers with 100 rupee notes as his/her preference = 8 × 50 = 400

Total number of 500 rupee notes required in the given scenario = 500 + 400 = 900.

Hence option 2 is the answer.

25. Correct Answer: A

	Research	Teaching	Administration
Bureaucrats	3x	3x	4x
Educationalist	m > n	N	o
Politicians	Y	Y	3y

Total = 24

Bureaucrats are in the ratio 3 : 3 : 4 only value will be 3, 3, 4. So x = 1

Educationalist n < m < o $m = \frac{o+n}{2}$

Politicians are in ratio 1 : 1 : 3 only value will be 1, 1, 3.

Possible value of m, n, o are 3, 2, 4 and 3, 1, 5.

	Case (i)						Case (ii)			
	R	T	A				R	T	A	
B	3	3	4	10		B	3	3	4	10
E	3	2	4	9		E	3	1	5	9
P	1	1	3	5		P	1	1	3	5
	7	6	11	24			7	5	12	24

The Size of the research committee is less than teaching committee is false

26. Correct Answer: 4

	Research	Teaching	Administration
Bureaucrats	3x	3x	4x
Educationalist	m > n	N	o
Politicians	Y	Y	3y

Total = 24

Bureaucrats are in the ratio 3 : 3 : 4 only value will be 3, 3, 4. So x = 1

Educationalist n < m < o $m = \frac{o+n}{2}$

Politicians are in ratio 1 : 1 : 3 only value will be 1, 1, 3.

Possible value of m, n, o are 3, 2, 4 and 3, 1, 5.

	Case (i)						Case (ii)			
	R	T	A				R	T	A	
B	3	3	4	10		B	3	3	4	10
E	3	2	4	9		E	3	1	5	9
P	1	1	3	5		P	1	1	3	5
	7	6	11	24			7	5	12	24

There are 4 bureaucrats in the administration committee

27. Correct Answer: 3

	Research	Teaching	Administration
Bureaucrats	3x	3x	4x
Educationalist	m > n	N	o
Politicians	Y	Y	3y

Total = 24

Bureaucrats are in the ratio 3 : 3 : 4 only value will be 3, 3, 4. So x = 1

Educationalist n < m < o $m = \dfrac{o+n}{2}$

Politicians are in ratio 1 : 1 : 3 only value will be 1, 1, 3.

Possible value of m, n, o are 3, 2, 4 and 3, 1, 5.

	Case (i)						Case (ii)			
	R	T	A				R	T	A	
B	3	3	4	10		B	3	3	4	10
E	3	2	4	9		E	3	1	5	9
P	1	1	3	5		P	1	1	3	5
	7	6	11	24			7	5	12	24

There are 3 educationalists in the research committee.

28. Correct Answer: B

	Research	Teaching	Administration
Bureaucrats	3x	3x	4x
Educationalist	m > n	N	o
Politicians	Y	Y	3y

Total = 24

Bureaucrats are in the ratio 3 : 3 : 4 only value will be 3, 3, 4. So x = 1

Educationalist n < m < o $m = \dfrac{o+n}{2}$

Politicians are in ratio 1 : 1 : 3 only value will be 1, 1, 3.

Possible value of m, n, o are 3, 2, 4 and 3, 1, 5.

	Case (i)						Case (ii)			
	R	T	A				R	T	A	
B	3	3	4	10		B	3	3	4	10
E	3	2	4	9		E	3	1	5	9
P	1	1	3	5		P	1	1	3	5
	7	6	11	24			7	5	12	24

Size of the teaching committee cannot be determined uniquely.

29. Correct Answer: C

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

Daisy minors in operations (O), so other three must have minored in Marketing (M).

As Adriana and Deb are from the same institute and Daisy and Amit are from same institute, so Bandita and Chitra must be from Z as only two females are from Z.

Female student from Y majors in operations, So Daisy cannot be from Y. Hence Daisy is from X, so is Amit. So Adriana and Deb are from Y.

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

Chitra and Bandita

30. Correct Answer: A

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

Daisy minors in operations (O), so other three must have minored in Marketing (M).

As Adriana and Deb are from the same institute and Daisy and Amit are from same institute, so Bandita and Chitra must be from Z as only two females are from Z.

Female student from Y majors in operations, So Daisy cannot be from Y. Hence Daisy is from X, so is Amit. So Adriana and Deb are from Y.

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

Deb minors in Finance

31. Correct Answer: C

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

Daisy minors in operations (O), so other three must have minored in Marketing (M).
As Adriana and Deb are from the same institute and Daisy and Amit are from same institute, so Bandita and Chitra must be from Z as only two females are from Z.
Female student from Y majors in operations, So Daisy cannot be from Y. Hence Daisy is from X, so is Amit. So Adriana and Deb are from Y.

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

Amit majors in Finance.

32. Correct Answer: D

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

Daisy minors in operations (O), so other three must have minored in Marketing (M).
As Adriana and Deb are from the same institute and Daisy and Amit are from same institute, so Bandita and Chitra must be from Z as only two females are from Z.
Female student from Y majors in operations, So Daisy cannot be from Y. Hence Daisy is from X, so is Amit. So Adriana and Deb are from Y.

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

Given one female student majors in finance. If Chitra majors in finance, Bandita majors in Operations.

Quant

1. Correct Answer: C

5x, 16y, 12z are in AP

$32y = 5x + 12z$ -----(1)

x, y, z are in GP

$y^2 = xz$ ---------(2)

Squaring both sides of (1), $1024y^2 = 25x^2 + 144z^2 + 120xz$

$1024xz = 25x^2 + 144z^2 + 120xz$

$25x^2 + 144z^2 - 904xz = 0$

$25x^2 - 900xz - 4xz + 144z^2 = 0$

$25x(x-36z) - 4z(x-36z) = 0$

$(25x-4z)(x-36z) = 0$

x,y and z are positive real numbers such that x $\quad x = \frac{4}{25}z$

Let the common ratio of the GP be r.

$\frac{1}{r^2} = \frac{4}{25}$

$r = \frac{5}{2}$

2. Correct Answer: D

Let the rates of work of each human and each robot be H and R respectively (both in units/day).

$15H + 5R = \frac{1}{30}$ -------------(1)

$5H + 15R = \frac{1}{60}$ -------------(2)

$3(1) - (2) => 40H = \frac{1}{12}$

$H = \frac{1}{480}$

In a day, 15 humans can complete 15H i.e. 1/32*th* of the job.15 humans can complete the job in 32 days.

3. Correct Answer: 10

Let the rates at which each filling pipe and each emptying pipe works be f and d respectively (both in units/hr).

6f+5d = 1/6 and 5f + 6d = 1/60

Solving, f = 1/12 and d = −1/15

Part of the tank that one draining and two filling pipes can fill in a hour=d+2f = −1/15 + 1/6=1/10

One draining and two filling pipes can fill the tank in 10 hours.

4. Correct Answer: C

Let the area of ABCD be 100. Side of ABCD = 10

Area of EFGH is 62.5 => Side of EFGH = $\sqrt{62.5}$

Triangles AEH, BFE, CGF and DHG are congruent by ASA.

Let AE = BF = CG = DH = x; EB = FC = DG = AH = 10 – x

$AE^2 + AH^2 = EH^2$

$x^2 + (10-x)^2 = (\sqrt{62.5})^2$

Solving, x = 2.5 or 7.5

Since it's given that CG is longer than EB, CG = 7.5 and EB = 2.5.

EB : CG = 1 : 3

5. Correct Answer: B

Any equilateral triangle formed by joining the midpoints of the sides of another equilateral triangle will have its side equal to half the side of the second equilateral triangle.

Side of T1 = 24 cm
Side of T2 = 12 cm
Side of T3 = 6 cm
and so on.

Sum of the areas of all the triangles = $\sqrt{3}/4$ $(24^2 + 12^2 + 6^2 + \text{-------})$

$$\frac{\sqrt{3}}{4}\left(\frac{576}{1-\frac{1}{4}}\right) = 192\sqrt{3}\,cm^2.$$

6. Correct Answer: D

$2^x = 3^{\log_5 2}$

Taking logarithms to base 5 on both sides, we have

$x\,(\log_5 2) = \log_5 2 \times \log_5 3$

$x = \log_5 3 = 1 + \log_5 3/5$

7. Correct Answer: A

66

Let the quantities of the paints A and B in the mixture sold be a litres and b litres respectively.
Value at which the entire mixture is sold=264
Profit percent made=10%
Value at which the entire mixture is bought =264*(100/110) = 240
The price at which the entire mixture is bought=24 per litre
Let the cost of B be x per litre.
Cost of A=(x+8)per litre

$$\frac{(x+8)a+xb}{10} = 24$$

The maximum cost of B will occur when A is the minimum.
b<=a.
So, the minimum a is 5. The corresponding b is 5.
Then (x+8)(5)+x(5)=240
x=20

8. Correct Answer: B

Let the numbers of marbles with Raju and Lalitha be 4x and 9x respectively. Let us say Lalitha gave y marbles to Raju.

$$\frac{4x+y}{9x-y} = \frac{5}{6}$$

$$y = \frac{21}{11}x$$

Fraction of original marbles that Lata gave to Raju $= \frac{y}{9x}$

$$= \frac{7}{33}$$

9. Correct Answer: B

Let the time taken by A to finish the job be "a" days. Time taken by B to finish the job = 5/4 a days.
Part of the job completed when A and B worked
Part of the job completed when A and B worked together for 4 days =

$$1-\frac{1}{2}-\frac{5}{100}=\frac{9}{20}$$

$$4(\frac{1}{a}+\frac{1}{\frac{5a}{4}}) = \frac{9}{20} => a=16.$$

Time taken by B alone to complete the entire job = 5a/4 = 20 days.

10. Correct Answer: D

Let the cost prices of A and B be Ca and Cb respectively.
Selling price of the mixture =40 per kg.
The profit made is 10% if A and B are mixed in the ratio 3:2.

$$\frac{40}{1.1} = \frac{3Ca+2Cb}{5} \text{------------(1)}$$

The profit made is 5% if A and B are mixed in the ratio 2:3.

$$\frac{40}{1.05} = \frac{2Ca+3Cb}{5} \text{-----------(2)}$$

Dividing (1) by (2), we have $\frac{1.05}{1.1} = \frac{3Ca+2Cb}{2Ca+3Cb}$

$$\frac{Ca}{Cb} = \frac{19}{24}$$

11. Correct Answer: C

Let the average age of people aged 51 years and above be A1 years. Let the average age of people aged below 51 years be A2 years. Let the number of people aged below 51 years be N2.
The average age of all the people in the apartment complex is 38 years.

$$38 = \frac{(A_1)(30)+(A_2)(N_2)}{30+N_2} \text{---------(1)}$$

We seek the maximum value of A2. This will occur when A1 is minimum i.e. 51.
from (1), 390 = N2(38-A2)
When A2 is maximum, N2 is maximum i.e. 39.
Then, A2 = 28
Maximum A2 = 28.

12. Correct Answer: B

Area of region $R = \frac{60}{360} * \pi(1)^2 = \frac{\pi}{6}$

Area of OCD is half that of region R.

Area of $OCD = \frac{1}{2}\left(\frac{\pi}{6}\right) = \frac{\pi}{12}$.

This is also equal to 1/2 (OC) (OD) sin 60

$\frac{1}{2}OC^2 \sin 60 = \frac{\pi}{12}$ (OC = OD)

$OC^2 = \dfrac{\dfrac{\pi}{6}}{\dfrac{\sqrt{3}}{2}} \qquad \Rightarrow OC = \sqrt{\dfrac{\pi}{3\sqrt{3}}}$

13. Correct Answer: 5
$0.25 \leq 2x \leq 200$.

Possible values of x satisfying the above inequality are –2, –1,0, 1, 2, 3, 4, 5, 6, 7. When x = 0, 1, 2, 4 and 6, $2^x + 2$ is divisible by 3 or 4.

The number of values of x is 5.

14. Correct Answer: C

Let the length and the breadth of the rectangle be l and b respectively.
Diameter of the circle=Diagonal of the rectangle
$26=\sqrt{l^2 + b^2}$
$l^2+b^2=676$
Possible values of l and b are 24 and 10 respectively.

15. Correct Answer: A

Area of the parallelogram ABCD = (base)(height) = (CD)(AP) = 72 sq.cm.
(CD)(AP) = 72
$9(AP) = 72 \Rightarrow AP = 8$
$DP = \sqrt{AD^2 - AP^2} = \sqrt{16^2 - 8^2} = 8\sqrt{3}$
Area of triangle
$APD = \frac{1}{2}(AP)(PD) = 32\sqrt{3}$

16. Correct Answer: A

$x^{2018} y^{2017} = 1/2$ and $x^{2016} y^{2019} = 8$
$\Rightarrow x^{2018}y^{2017} = 1/2$ ----(1)
$\Rightarrow x^{2016}y^{2019} = 8$ ----- (2)
Dividing (1) by (2)
$\Rightarrow x^2/y^2 = 1/16$
$\Rightarrow y = 4x$
Putting value of x in (1), we get
$\Rightarrow (y/4)^{2018} y^{2017} = 1/2$
$\Rightarrow y^{2035} = 2^{2035}$
$\Rightarrow y = 2$
$\Rightarrow x = 2 \times 1/4 = 1/2$
$\therefore ? = x^2 + y^3 = 1/4 + 8 = 33/4$

17. Correct Answer: A
A got 36 marks but falls short of pass marks by 68%. Maximum possible score is N. Pass mark is 45% of N.

32% of 45% of N = 36 $\Rightarrow$ N = 250

18. Correct Answer: 32

The maximum value of f(x) will occur when $2x^2 = 52 - 5x$ i.e. when $2x^2+5x-52=0$

i.e. when 2 $x^2+13x-8x-52=0$

$\Rightarrow$ (2x + 13)(x – 4)=0 $\Rightarrow$ x = -13/2 or 4. But x is any positive real number. So, x = 4. Maximum value of f (x) = 2(4²) = 32

19. Correct Answer: 12

Let the time taken for car 1 to reach P from A be x hours.
Speed of car 1=AP/x
BP=3AP.
Car 2 starts from B to A and reaches P one hour after car 1 reaches P.

Speed of car 2=$\frac{3AP}{x+1}$

$\frac{3AP}{x+1} = \frac{1}{2}(\frac{AP}{x})$ $x=\frac{1}{5}$

Time taken for car 1 to reach P from A is 12 min.

20. Correct Answer: 121000

Let each instalment be Rs. x. Equating the present value of both the instalments to the money borrowed,

$\frac{x}{1.1} + \frac{x}{1.1^2} = 210000$

x = 121000

21. Correct Answer: 60

Let the average score of the aspirant in all the tests be A. Let the number of tests be N.
The aspirant's average score for the first 10 tests and last 10 tests are 20 and 30 respectively.

$\frac{NA-200}{N-10} = A+1$ and $\frac{NA-300}{N-10} = A - 1$

Solving, N = 60.

22. Correct Answer: 15

Let the time taken by S to reach Z be t hours.
Let the speed of T be S_t.Distance between X and Z is 3/5 of the distance between X and Y.
XZ : ZY = 3 : 2

$\frac{(t+1)\times S_t}{\frac{3}{4}\times S_t \times t} = \frac{3}{2}$

$\Rightarrow t = 8$

S takes 8 hours to cover YZ. T would take 8 × (3/4) i.e. 6 hours to cover ZY. T would take t + 1 i.e. 9 hours to cover XZ. T would take 15 hours to reach Y.

23. Correct Answer: 198

The radius of the cone is 4 feet.

The tip of the cone is a cone of height 3 feet. By similarity, its radius is 1 foot.

The volume of the remaining part of the cone=Volume of the cone-Volume of the tip of the cone=$64\pi-\pi=63\pi=63*(22/7)=198$

24. Correct Answer: C

$$\log_{12}81 = p \Rightarrow \log_{12}3^4 = p$$
$$\Rightarrow 4\log_{12}3 = p$$
$$\Rightarrow \frac{p}{4} = \log_{12}3$$
$$3\left(\frac{4-p}{4+p}\right) = 3\left(\frac{1-\frac{p}{4}}{1+\frac{p}{4}}\right)$$
$$= 3\left(\frac{1-\log_{12}3}{1+\log_{12}3}\right)$$
$$= 3\left(\frac{\log_{12}12 - \log_{12}3}{\log_{12}12 + \log_{12}3}\right)$$
$$= 3\left(\frac{\log(12/3)}{\log(12\times3)}\right) = 3\frac{\log 4}{\log 36}$$
$$= 3\log_{36}4$$
$$= \log_6 8$$

25. Correct Answer: B

Let the cost price of peanuts for the wholesaler be x per kg. Cost price of walnuts for the wholesaler is 3x per kg. The wholesaler sold 8 kg of peanuts at 10% profit and 16 kg of walnuts at 20% profit to a shopkeeper. Total cost price to the shopkeeper = $(8)(x)(1.1) + 16(3x)(1.2) = 66.4x$
The shopkeeper lost 5 kg walnuts and 3 kg peanuts. The shopkeeper sold the mixture of 11 kg walnuts and 5 kg peanuts.
His total selling price=166(16) = 2656
His total cost price = $2656(\frac{100}{125})$ = 2124.8

$66.4x = 2124.8$
$x = 32$
Price at which the wholesaler bought walnuts = 3x = 96/- per kg

26. Correct Answer: 54

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

f(11) = 91

Let f(12) = a

f(13) = 91 + a

f(14) = 91 + 2a

f(15) = 182 + 3a. This is also equal to 617.

182 + 3a = 617 => a = 145

f(10) = f(12) - f(11) = 145 - 91 = 54

27. Correct Answer: 40

Let the other two numbers be y and z.

73yz - 37yz = 720

yz=20

Minimum possible sum of the squares of the other two numbers would occur when y = z

So $y^2 = 20 = z^2$

Hence $y^2 + z^2 = 40$

28. Correct Answer: A

Let the speeds of Partha and Narayan be Sp and Sn respectively.

$\frac{60}{Sp} = \frac{60}{Sn} + 4$

$\frac{30}{Sp} = \frac{60}{Sn} - 2$

Subtracting, $\frac{30}{Sp} = 6$

Sp = 5 kmph

29. Correct Answer: A

Let the 6 cm long chord be x cm away from the centre of the circle. Let the radius of the circle be r cm. The perpendiculars from the centre of the circle to the chords bisect the chords.
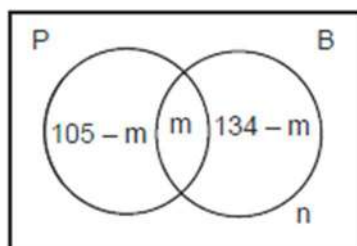
$r^2 = x^2 + 3^2 = (x+1)^2 + 2^2$

Solving, x = 2 and r = √13

30. Correct Answer: A

Let the number of students who like both pizza and burger be 'm'
The number of students who like neither of them be n

From venn diagram
105 − m + m + 134 − m + n = 200
m − n = 39
∴ The possible values of (m, n) are (39, 0) (40, 1).......(105, 66)
∴ The number of students who like only burger is lies in the range [134 − 105, 134 − 39] = [29, 95]
∴ From options, 93 is a possible answer.

31. Correct Answer: 502

As the digits appear in ascending order in the numbers, number of ways of forming a n-digit number using the 9 digits = ^9C_n

Number of possible two-digit numbers which can be formed = $^9C_2 + {}^9C_3 + {}^9C_4 + {}^9C_5 + {}^9C_6 + {}^9C_7 + {}^9C_8 + {}^9C_9 = 2^9 - ({}^9C_0 + {}^9C_1) = 512 - (1 + 9) = 502$

32. Correct Answer: B

$$u^2 + (u - 2v - 1)^2 = -4v(u + v)$$
$$\Rightarrow u^2 + u^2 + 4v^2 + 1 - 4uv + 4v - 2u + 4vu + 4v^2 = 0$$
$$\Rightarrow 2u^2 - 2u + 8v^2 + 4v + 1 = 0$$
$$\Rightarrow 2\left(u^2 - u + \frac{1}{4}\right) + 2\left(4v^2 + 2v + \frac{1}{4}\right) = 0$$
$$\Rightarrow 2\left(u - \frac{1}{2}\right)^2 + 2\left(2v + \frac{1}{2}\right)^2 = 0$$
$$\Rightarrow u - \frac{1}{2} = 0; \ 2v + \frac{1}{2} = 0$$
$$u = \frac{1}{2} \text{ and } v = -\frac{1}{4}$$
$$u + 3v = \frac{1}{2} - \frac{3}{4} = -\frac{1}{4}$$

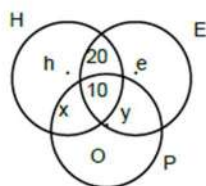**33. Correct Answer: C**

$5 + \log_3 a = 2^3 = 8 \Rightarrow a = 27$

Similarly, $4a + 12 + \log_2 b = 5^3 = 125$

Since $a = 27$, $4(27) + 12 + \log_2 b = 125 \Rightarrow b = 32$.

$a + b = 59$.

34. Correct Answer: 52

Let the number of students who studying only H be h, only E be e, only H and P but not E be x, only E and P but not H be y.

Given only P = 0
All three = 10;
Studying only H and E but not P = 20
Given number of students studying H =
Number of students studying E =
h + x + 20 + 10 = e + y + 20 + 10
h + x = e + y
total number of students = 74
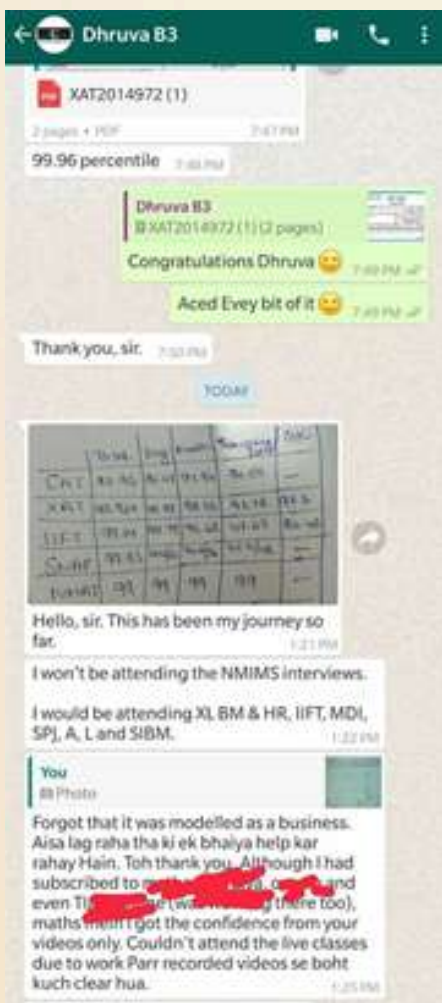∴ h + x + 20 + 10 + e + y = 74
h + x + e + y = 44
h + x + h + x = 44
h + x = 22
∴ The number of students studying H = h + x + 20 + 10 = 22 + 20 + 10 = 52.

India's first CAT institute to be recognized on National TV for the unparallel contribution towards the field of Education
Show – Icons of Bharat – NDTV India

Personal Mentoring is our forte!!
If you're someone who needs handsholding and guidance, we will be there for you!!