

Time: 120 Mins

Total Marks: 228

Important Instructions

- (i) Total Number of Questions: 76
- (ii) Number of Question in Verbal Ability and Reading Comprehension (VARC): 26
- (iii) Number of Question in Data Interpretation and Logical Reasoning (DILR): 24
- (iv) Number of Question in Quantitative Ability (QA): 26
- (v) 40 Minutes are allotted to attempt each section
- (vi) 4 answer options for each MCQ type question
- (vii) Answers are typed in the given space on the computer screen for Non-MCQ.
- (viii) For each correct answer: + 3 marks
- (ix) Negative marking (Applicable for wrong answers in MCQs): - 1 mark

Verbal Ability and Reading Comprehension (VARC)**Passage 1**

Directions (Q. 1 to 5): Read the following passage carefully and answer the questions that follows.

Vocabulary used in speech or writing organizes itself in seven parts of speech (eight, if you count interjections such as Oh! and Gosh! and Fuhgeddaboudit!). Communication composed of these parts of speech must be organized by rules of grammar upon which we agree. When these rules break down, confusion and misunderstanding result. Bad grammar produces bad sentences. My favorite example from Strunk and White is this one: "As a mother of five, with another one on the way, my ironing board is always up."

Nouns and verbs are the two indispensable parts of writing. Without one of each, no group of words can be a sentence, since a sentence is, by definition, a group of words containing a subject (noun) and a predicate (verb); these strings of words begin with a capital letter, end with a period, and combine to make a complete thought which starts in the writer's head and then leaps to the reader's.

Must you write complete sentences each time, every time? Perish the thought. If your work consists only of fragments and floating clauses, the Grammar Police aren't going to come and take you away. Even William Strunk, that Mussolini of rhetoric, recognized the delicious pliability of language. "It is an old observation," he writes, "that the best writers sometimes disregard the rules of rhetoric." Yet he goes on to add this thought, which I urge you to consider: "Unless he is certain of doing well, [the writer] will probably do best to follow the rules."

The telling clause here is Unless he is certain of doing well. If you don't have a rudimentary grasp of how the parts of speech translate into coherent sentences, how can you be certain that you are doing well? How will you know if you're doing ill, for that matter? The answer, of course, is that you can't, you won't. One who does grasp the rudiments of grammar finds a comforting simplicity at its heart, where there need be only nouns, the words that name, and verbs, the words that act.

Take any noun, put it with any verb, and you have a sentence. It never fails. Rocks explode. Jane transmits. Mountains float. These are all perfect sentences. Many such thoughts make little rational sense, but even the stranger ones (Plums deify!) have a kind of poetic weight that's nice. The simplicity of noun-verb construction is useful—at the very least it can provide a safety net for your writing. Strunk and White caution against too many simple sentences in a row, but simple sentences provide a path you can follow when you fear getting lost in the tangles of rhetoric—all those restrictive and nonrestrictive clauses, those modifying phrases, those appositives and compound—complex sentences. If you start to freak out at the sight of such unmapped territory (unmapped by you, at least), just remind yourself that rocks explode, Jane transmits, mountains float, and plums deify. Grammar is . . . the pole you grab to get your thoughts up on their feet and walking.

- Q. 1.** Inferring from the passage, the author could be most supportive of which one of the following practices ?
1. The critique of standardised rules of punctuation and capitalisation.
 2. A campaign demanding that a writer's creative license should allow the breaking of grammatical rules.
 3. The availability of language software that will standardise the rules of grammar as an aid to writers.
 4. A Creative Writing course that focuses on how to avoid the use of rhetoric.
- Q. 2.** Which one of the following quotes best captures the main concern of the passage ?
1. "The telling clause here is Unless he is certain of doing well."
 2. "Nouns and verbs are the two indispensable parts of writing. Without one of each, no group of words can be a sentence..."
 3. "Strunk and White caution against too many simple sentences in a row, but simple sentences provide a path you can follow when you fear getting lost in the tangles of rhetoric..."
 4. "Bad grammar produces bad sentences."
- Q. 3.** "Take any noun, put it with any verb, and you have a sentence. It never fails. Rocks explode. Jane transmits. Mountains float." None of the following statements can be seen as similar EXCEPT :
1. Take an apple tree, plant it in a field, and you have an orchard.
 2. A collection of people with the same sports equipment is a sports team.
 3. A group of nouns arranged in a row becomes a sentence.
 4. Take any vegetable, put some spices in it, and you have a dish.
- Q. 4.** Which one of the following statements, if false, could be seen as supporting the arguments in the passage ?
1. It has been observed that writers sometimes disregard the rules of rhetoric.
 2. Perish the thought that complete sentences necessarily need nouns and verbs!
 3. Regarding grammar, women writers tend to be more attentive to method and accuracy.
 4. An understanding of grammar helps a writer decide if she/he is writing well or not.
- Q. 5.** All of the following statements can be Inferred from the passage EXCEPT that:
1. Sentences do not always have to be complete.
 2. The primary purpose of grammar is to ensure that sentences remain simple.
 3. The subject—predicate relation is the same as the noun—verb relation.
 4. "Grammar Police" is a metaphor for critics who focus on linguistic rules.

Passage 2

Directions (Q. 6 to 9): Read the following passage carefully and answer the questions that follows.

Few realise that the government of China, governing an empire of some 60 million people during the Tang dynasty (618–907), implemented a complex financial system that recognized grain, coins and textiles as money. . . . Coins did have certain advantages: they were durable, recognisable and provided a convenient medium of exchange, especially for smaller transactions. However, there were also disadvantages. A continuing shortage of copper meant that government mints could not produce enough coins for the entire empire, to the extent that for most of the dynasty's history, coins constituted only a tenth of the money supply. One of the main objections to calls for taxes to be paid in coin was that peasant producers who could weave cloth or grow grain — the other two major currencies of the Tang — would not be able to produce coins, and therefore would not be able to pay their taxes. . . .

As coins had advantages and disadvantages, so too did textiles. If in circulation for a long period of time, they could show signs of wear and tear. Stained, faded and torn bolts of textiles had less value than a brand new bolt. Furthermore, a full bolt had a particular value. If consumers cut textiles into smaller pieces to buy or sell something worth less than a full bolt, that, too, greatly lessened the value of the textiles. Unlike coins, textiles could not be used for small transactions; as [an official] noted, textiles could not "be exchanged by the foot and the inch". . . .

But textiles had some advantages over coins. For a start, textile production was widespread and there were fewer problems with the supply of textiles. For large transactions, textiles weighed less than their equivalent in coins since a string of coins ..., could weigh as much as 4 kg. Furthermore, the dimensions of a bolt of silk held remarkably steady from the third to the tenth century: 56 cm wide and 12 m long . . . The values of different textiles were also more stable than the fluctuating values of coins. . . .

The government also required the use of textiles for large transactions. Coins, on the other hand, were better suited for smaller transactions, and possibly, given the costs of transporting coins, for a more local usage. Grain, because it rotted easily, was not used nearly as much as coins and textiles, but taxpayers were required to pay grain to the government as a share of their annual tax obligations, and official salaries were expressed in weights of grain. . . .

In actuality, our own currency system today has some similarities even as it is changing in front of our eyes... We have cash — coins for small transactions like paying for parking at a meter, and banknotes for other items; cheques and debit/credit cards for other, often larger, types of payments. At the same time, we are shifting to electronic banking and making payments online. Some young people never use cash [and] do not know how to write a cheque. . . .

Q. 6. During the Tang period, which one of the following would not be an economically sound decision for a small purchase in the local market that is worth one-eighth of a bolt of cloth ?

1. Making the payment with the appropriate weight of grain.
2. Paying with a faded bolt of cloth that has approximately the same value.
3. Cutting one-eighth of the fabric from a new bolt to pay the amount.
4. Using coins issued by the government to make the payment.

Q. 7. According to the passage, the modern currency system shares all the following features with that of the Tang, EXCEPT that :

1. It uses different currencies for different situations.
2. Its currencies fluctuate in value over time.
3. It is undergoing transformation.
4. It uses different materials as currency.

Q. 8. In the context of the passage, which one of the following can be inferred with regard to the use of currency during the Tang era ?

1. Copper coins were more valuable and durable than textiles.
2. Grains were the most used currency because of government requirements.
3. Currency that deteriorated easily was not used for official work.
4. Currency usage was similar to that of modern times.

Q. 9. When discussing textiles as currency in the Tang period, the author uses the words “steady” and “stable” to indicate all of the following EXCEPT :

1. Reliable transportation.
2. Reliable quality.
3. Reliable measurements.
4. Reliable supply.

Passage 3

Directions (Q. 10 to 13): Read the following passage carefully and answer the questions that follows.

In the late 1960s, while studying the northern–elephant–seal population along the coasts of Mexico and California, Burney Le Boeuf and his colleagues couldn’t help but notice that the threat calls of males at some sites sounded different from those of males at other sites. . . . That was the first time dialects were documented in a nonhuman mammal. . . .

All the northern elephant seals that exist today are descendants of the small herd that survived on Isla Guadalupe [after the near extinction of the species in the nineteenth century]. As that tiny population grew, northern elephant seals started to recolonize former breeding locations. It was precisely on the more recently colonized Islands where Le Boeuf found that the tempos of the male vocal displays showed stronger differences to the ones from Isla Guadalupe, the founder colony.

In order to test the reliability of these dialects over time, Le Boeuf and other researchers visited Año Nuevo Island in California—the Island where males showed the slowest pulse rates in their calls—every winter from 1968 to 1972. “What we found is that the pulse rate increased, but it still remained relatively slow compared to the other colonies we had measured in the past” Le Boeuf told me.

At the individual level, the pulse of the calls stayed the same: A male would maintain his vocal signature throughout his lifetime. But the average pulse rate was changing. Immigration could have been responsible for this increase, as in the early 1970s, 43 percent of the males on Año Nuevo had come from southern rookeries that had a faster pulse rate. This led Le Boeuf and his collaborator, Lewis Petrinovich, to deduce that the dialects were, perhaps, a result of isolation over time, after the breeding sites had been recolonized. For instance, the first settlers of Año Nuevo could have had, by chance, calls with low pulse rates. At other sites, where the scientists found faster pulse rates, the opposite would have happened—seals with faster rates would have happened to arrive first.

As the population continued to expand and the Islands kept on receiving immigrants from the original population, the calls in all locations would have eventually regressed to the average pulse rate of the founder colony. In the decades that followed, scientists noticed that the geographical variations reported in 1969 were not obvious anymore. . . . In the early 2010s, while studying northern elephant seals on Año Nuevo Island, [researcher Caroline] Casey noticed, too, that what Le Boeuf had heard decades ago was not what she heard now. . . . By performing more sophisticated statistical analyses on both sets of data, [Casey and Le Boeuf] confirmed that dialects existed back then but had vanished. Yet there are other differences between the males from the late 1960s and their great-great-grandsons: Modern males exhibit more individual diversity, and their calls are more complex. While 50 years ago the drumming pattern was quite simple and the dialects denoted just a change in tempo, Casey explained, the calls recorded today have more complex structures, sometimes featuring doublets or triplets. . . .

Q. 10. From the passage it can be inferred that the call pulse rate of male northern elephant seals in the southern rookeries was faster because :

1. A large number of male northern elephant seals migrated from the southern rookeries to Año Nuevo Island in the early 1970s.
2. The calls of male northern elephant seals in the southern rookeries have more sophisticated structures, containing doublets and triplets.
3. The male northern elephant seals of Isla Guadalupe with faster call pulse rates might have been the original settlers of the southern rookeries.
4. A large number of male northern elephant seals from Año Nuevo Island might have migrated to the southern rookeries to recolonise them.

Q. 11. Which one of the following best sums up the overall history of transformation of male northern elephant seal calls ?

1. Owing to migrations in the aftermath of near species extinction, the average call pulse rates in the recolonised breeding locations exhibited a gradual increase until they matched the tempo at the founding colony.

2. Owing to migrations in the aftermath of near species extinction, the calls have transformed from exhibiting complex composition, less individual variety, and great regional variety to simple composition, less individual variety, and great regional variety.
3. The calls have transformed from exhibiting simple composition, less individual variety, and great regional variety to complex composition, great individual variety, and less regional variety.
4. The calls have transformed from exhibiting simple composition, great individual variety, and less regional variety to complex composition, less individual variety, and great regional variety.

Q. 12. Which one of the following conditions, if true, could have ensured that male northern elephant seal dialects did not disappear ?

1. The call tempo of individual male seals in host colonies changed to match the average call tempo of immigrant male seals.
2. The call tempo at individual immigrant male seals changed to match the average tempo of resident male seals in the host colony.

3. Besides Isla Guadalupe, there was one more founder colony with the same average male call tempo from which male seals migrated to various other colonies.
4. Besides Isla Guadalupe, there was one more surviving colony with the same average male call tempo from which no migration took place.

Q. 13. All of the following can be inferred from Le Boeuf's study as described in the passage EXCEPT that :

1. Changes in population and migration had no effect on the call pulse rate of individual male northern elephant seals.

2. Male northern elephant seals might not have exhibited dialects had they not become nearly extinct in the nineteenth century.

3. The influx of new northern elephant seals into Año Nuevo Island would have soon made the call pulse rate of its male seals exceed that of those at Isla Guadalupe.

4. The average call pulse rate of male northern elephant seals at Año Nuevo Island increased from the early 1970s till the disappearance of dialects.

Passage 4

Directions (Q. 14 to 18): Read the following passage carefully and answer the questions that follows.

The word 'anarchy' comes from the Greek anarkhia, meaning contrary to authority or without a ruler, and was used in a derogatory sense until 1840, when it was adopted by Pierre-Joseph Proudhon to describe his political and social ideology. Proudhon argued that organization without government was both possible and desirable. In the evolution of political ideas, anarchism can be seen as an ultimate projection of both liberalism and socialism, and the differing strands of anarchist thought can be related to their emphasis on one or the other of these.

Historically, anarchism arose not only as an explanation of the gulf between the rich and the poor in any community, and of the reason why the poor have been obliged to fight for their share of a common inheritance, but as a radical answer to the question 'What went wrong?' that followed the ultimate outcome of the French Revolution. It had ended not only with a reign of terror and the emergence of a newly rich ruling caste, but with a new adored emperor, Napoleon Bonaparte, strutting through his conquered territories.

The anarchists and their precursors were unique on the political Left in affirming that workers and peasants, grasping the chance that arose to bring an end to centuries of exploitation and tyranny, were inevitably betrayed by the new class of politicians, whose first priority was to re-establish a centralized state power. After every revolutionary uprising, usually won at a heavy cost for ordinary populations, the new rulers had no hesitation in applying violence and terror, a secret police, and a professional army to maintain their control.

For anarchists the state itself is the enemy, and they have applied the same interpretation to the outcome of every revolution of the 19th and 20th centuries. This is not merely because every state keeps a watchful and sometimes punitive eye on its dissidents, but because every state protects the privileges of the powerful.

The mainstream of anarchist propaganda for more than a century has been anarchist-communism, which argues that property in land, natural resources, and the means of production should be held in mutual control by local communities, federating for innumerable joint purposes with other communes. It differs from state socialism in opposing the concept of any central authority. Some anarchists prefer to distinguish between anarchist-communism and collectivist anarchism in order to stress the obviously desirable freedom of an individual or family to possess the resources needed for living, while not implying the right to own the resources needed by others....

There are, unsurprisingly, several traditions of individualist anarchism, one of them deriving from the 'conscious egoism' of the German writer Max Stirner (1806–56), and another from a remarkable series of 19th-century American figures who argued that in protecting our own autonomy and associating with others for common advantages, we are promoting the good of all. These thinkers differed from free market liberals in their absolute mistrust of American capitalism, and in their emphasis on mutualism.

- Q. 14.** According to the passage, what is the one idea that is common to all forms of anarchism ?
1. There is no idea common to all forms of anarchism; that is why it is anarchic.
 2. They all focus on the primacy of the power of the individual.
 3. They all derive from the work of Pierre-Joseph Proudhon.
 4. They are all opposed to the centralisation of power in the state.
- Q. 15.** Of the following sets of concepts, identify the set that is conceptually closest to the concerns of the passage.
1. Anarchism, State, Individual, Freedom.
 2. Revolution, State, Strike, Egoism.
 3. Anarchism, Betrayal, Power, State.
 4. Revolution, State, Protection, Liberals.
- Q. 16.** The author makes all of the following arguments in the passage, EXCEPT :
1. The failure of the French Revolution was because of its betrayal by the new class of politicians who emerged from it.
 2. Individualist anarchism is actually constituted of many streams, all of which focus on the autonomy of the individual.
 3. For anarchists, the state is the enemy because all states apply violence and terror to maintain their control.
 4. The popular perception of anarchism as espousing lawlessness and violence comes from a mainstream mistrust of collectivism.
- Q. 17.** The author believes that the new ruling class of politicians betrayed the principles of the French Revolution, but does not specify in what way. In the context of the passage, which statement below is the likeliest explanation of that betrayal ?
1. The new ruling class was constituted mainly of anarchists who were against the destructive impact of the Revolution on the market.
 2. The new ruling class struck a deal with the old ruling class to share power between them.
 3. The new ruling class rode to power on the strength of the workers' revolutionary anger, but then turned to oppress that very class.
 4. The anarchists did not want a new ruling class, but were not politically strong enough to stop them.
- Q. 18.** Which one of the following best expresses the similarity between American individualist anarchists and free-market liberals as well as the difference between the former and the latter ?
1. Both are sophisticated arguments for capitalism; but the former argue for a morally upright capitalism, while the latter argue that the market is the only morality.
 2. Both reject the regulatory power of the state; but the former favour a people's state, while the latter favour state intervention in markets.
 3. Both are founded on the moral principles of altruism; but the latter conceive of the market as a force too mystical for the former to comprehend.
 4. Both prioritise individual autonomy; but the former also emphasise mutual dependence, while the latter do not do so.
- Q. 19.** Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer :
1. Talk was the most common way for enslaved men and women to subvert the rules of their bondage, to gain more agency than they were supposed to have.
 2. Even in conditions of extreme violence and unfreedom, their words remained ubiquitous, ephemeral, irrepressible, and potentially transgressive.
 3. Slaves came from societies in which oaths, orations, and invocations carried great potency, both between people and as a connection to the all-powerful spirit world.
 4. Freedom of speech and the power to silence may have been preeminent markers of white liberty in Colonies, but at the same time, slavery depended on dialogue: slaves could never be completely muted.
 5. Slave-owners obsessed over slave talk, though they could never control it, yet feared its power to bind and inspire—for, as everyone knew, oaths, whispers, and secret conversations bred conspiracy and revolt.

Q. 20. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

For nearly a century most psychologists have embraced one view of intelligence. Individuals are born with more or less intelligence potential (I. Q.); this potential is heavily influenced by heredity and difficult to alter; experts in measurement can determine a person's intelligence early in life, currently from paper-and-pencil measures, perhaps eventually from examining the brain in action or even scrutinizing his/her genome. Recently, criticism of this conventional wisdom has mounted. Biologists ask if speaking of a single entity called "intelligence" is coherent and question the validity of measures used to estimate heritability of a trait in humans, who, unlike plants or animals, are not conceived and bred under controlled conditions.

1. Biologists have criticised that conventional wisdom that individuals are born with more or less intelligence potential.
2. Biologists have questioned the view that 'intelligence' is a single entity and the ways in which what is inherited.
3. Biologists have questioned the long-standing view that 'intelligence' is a single entity and the attempts to estimate its heritability.
4. Biologists have started questioning psychologists' view of 'intelligence' as a measurable immutable characteristic of an individual.

Q. 21. Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer :

1. For feminists, the question of how we read is inextricably linked with the question of what we read.
2. Elaine Showalter's critique of the literary curriculum is exemplary of this work.
3. Androcentric literature structures the reading experience differently depending on the gender of the reader.
4. The documentation of this realization was one of the earliest tasks undertaken by feminist critics.

5. More specifically, the feminist inquiry into the activity of reading begins with the realization that the literary canon is androcentric, and that this has a profoundly damaging effect on women readers.

Q. 22. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

As Soviet power declined, the world became to some extent multipolar, and Europe strove to define an independent identity. What a journey Europe has undertaken to reach this point. It had in every century changed its internal structure and invented new ways of thinking about the nature of international order. Now at the culmination of an era, Europe, in order to participate in it, felt obliged to set aside the political mechanisms through which it had conducted its affairs for three and a half centuries. Impelled also by the desire to cushion the emergent unification of Germany, the new European Union established a common currency in 2002 and a formal political structure in 2004. It proclaimed a Europe united, whole, and free, adjusting its differences by peaceful mechanisms.

1. Europe has consistently changed in keeping with the changing world order and that has culminated in a united Europe.
2. Europe has chosen to lower political and economic heterogeneity, in order to adapt itself to an emerging multi-polar world.
3. Europe has consistently changed its internal structure to successfully adapt to the changing world order.
4. The establishment of a formal political structure in Europe was hastened by the unification of Germany and the emergence of a multipolar world.

Q. 23. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

For years, movies and television series like Crime Scene Investigation (CSI) paint an unrealistic picture of the "science of voices."

In the 1994 movie *Clear and Present Danger* an expert listens to a brief recorded utterance and declares that the speaker is “Cuban, aged 35 to 45, educated in the [...] eastern United States.” The recording is then fed to a supercomputer that matches the voice to that of a suspect, concluding that the probability of correct identification is 90%. This sequence sums up a good number of misimpressions about forensic phonetics, which have led to errors in real-life justice. Indeed, that movie scene exemplifies the so-called “CSI effect”. The phenomenon in which judges hold unrealistic expectations of the capabilities of forensic science.

1. Although voice recognition is often presented as evidence in legal cases, its scientific basis can be shaky.
2. Voice recognition as used in many movies to identify criminals has been used to identify criminals in real life also.
3. Movies and televisions have led to the belief that the use of forensic phonetics in legal investigations is robust and fool proof.
4. Voice recognition has started to feature prominently in crime-scene intelligence investigations because of movies and television series.

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

1. Tensions and sometimes conflict remain an issue in and between the 11 states in South East Asia (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste and Vietnam).
2. China’s rise as a regional military power and its claims in the South China Sea have become an increasingly pressing security concern for many South East Asian states.
3. Since the 1990s, the security environment of South East Asia has seen both continuity and profound changes.
4. These concerns cause states from outside the region to take an active interest in South East Asian security.

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

1. Man has used poisons for assassination purposes ever since the dawn of civilization, against individual enemies but also occasionally against armies.
2. These dangers were soon recognized, and resulted in two international declarations—in 1874 in Brussels and in 1899 in The Hague—that prohibited the use of poisoned weapons.
3. The foundation of microbiology by Louis Pasteur and Robert Koch offered new prospects for those interested in biological weapons because it allowed agents to be chosen and designed on a rational basis.
4. Though treaties were all made in good faith, they contained no means of control, and so failed to prevent interested parties from developing and using biological weapons.

Q. 26. The four sentences (labelled 1, 2, 3, 4) below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer :

1. Relying on narrative structure alone, indigenous significances of nineteenth century San folktales are hard to determine.
2. Using their supernatural potency, benign shamans transcend the levels of the San cosmos in order to deal with social conflict and to protect material resources and enjoy a measure of respect that sets them apart from ordinary people.
3. Selected tales reveal that they deal with a form of spiritual conflict that has social implications and concern conflict between people and living or dead malevolent shamans.
4. Meaning can be elicited, and the tales contextualized, by probing beneath the narrative of verbatim, original-language records and exploring the connotations of highly significant words and phrases.

Data Interpretation and Logical Reasoning (DILR)

Directions (Q. 1 to 4): Read the following passage carefully and answer the questions that follows.

1000 patients currently suffering from a disease were selected to study the effectiveness of treatment of four types of medicines — A, B, C and D. These patients were first randomly assigned into two groups of equal size, called treatment group and control group. The patients in the control group were not treated with any of these medicines; instead they were given a dummy medicine, called placebo, containing only sugar and starch. The following information is known about the patients in the treatment group.

- (a) A total of 250 patients were treated with type A medicine and a total of 210 patients were treated with type C medicine.
- (b) 25 patients were treated with type A medicine only. 20 patients were treated with type C medicine only. 10 patients were treated with type D medicine only.
- (c) 35 patients were treated with type A and type D medicines only. 20 patients were treated with type A and type B medicines only. 30 patients were treated with type A and type C medicines only. 20 patients were treated with type C and type D medicines only.
- (d) 100 patients were treated with exactly three types of medicines.
- (e) 40 patients were treated with medicines of types A, B and C, but not with medicines of type D. 20 patients were treated with medicines of types A, C and D, but not with medicines of type B.
- (f) 50 patients were given all the four types of medicines. 75 patients were treated with exactly one type of medicine.

- Q. 1. How many patients were treated with medicine type B ?
 Q. 2. The number of patients who were treated with medicine types B, C and D, but not type A was :
 Q. 3. How many patients were treated with medicine types B and D only ?
 Q. 4. The number of patients who were treated with medicine type D was :

Directions (Q. 5 to 10): Read the following passage carefully and answer the questions that follows.

In a certain board examination, students were to appear for examination in five subjects: English, Hindi, Mathematics, Science and Social Science. Due to a certain emergency situation, a few of the examinations could not be conducted for some students. Hence, some students missed one examination and some others missed two examinations. Nobody missed more than two examinations.

The board adopted the following policy for awarding marks to students. If a student appeared in all five examinations, then the marks awarded in each of the examinations were on the basis of the scores obtained by them in those examinations.

If a student missed only one examination, then the marks awarded in that examination was the average of the best three among the four scores in the examinations they appeared for.

If a student missed two examinations, then the marks awarded in each of these examinations was the average of the best two among the three scores in the examinations they appeared for.

The marks obtained by six students in the examination are given in the table below. Each of them missed either one or two examinations.

	English	Hindi	Mathematics	Science	Social Science
Alva	80	75	70	75	60
Bithi	90	80	55	85	85
Carl	75	80	90	100	90
Deep	70	90	100	90	80
Esha	80	85	95	60	55
Foni	83	72	78	88	83

The following facts are also known.

- I. Four of these students appeared in each of the English, Hindi, Science, and Social Science examinations.
 - II. The student who missed the Mathematics examination did not miss any other examination.
 - III. One of the students who missed the Hindi examination did not miss any other examination.
- The other student who missed the Hindi examination also missed the Science examination.

- Q. 5.** Who among the following did not appear for the Mathematics examination ?
1. Alva
 2. Foni
 3. Esha
 4. Carl
- Q. 6.** Which students did not appear for the English examination ?
1. Cannot be determined
 2. Carl and Deep
 3. Esha and Foni
 4. Alva and Bithi
- Q. 7.** What BEST can be concluded about the students who did not appear for the Hindi examination ?
1. Alva and Deep
 2. Deep and Esha
 3. Alva and Esha
 4. Two among Alva, Deep and Esha
- Q. 8.** What BEST can be concluded about the students who missed the Science examination ?
1. Deep and Bithi
 2. Alva and Deep
 3. Alva and Bithi
 4. Bithi and one out of Alva and Deep
- Q. 9.** How many out of these six students missed exactly one examination ?
- Q. 10.** For how many students can we be definite about which examinations they missed ?

Directions (Q. 11 to 16): Read the following passage carefully and answer the questions that follows.

Four institutes, A, B, C, and D, had contracts with four vendors W, X, Y, and Z during the ten calendar years from 2010 to 2019. The contracts were either multi-year contracts running for several consecutive years or single-year contracts. No institute had more than one contract with the same vendor. However, in a calendar year, an institute may have had contracts with multiple vendors, and a vendor may have had contracts with multiple institutes. It is known that over the decade, the institutes each got into two contracts with two of these vendors, and each vendor got into two contracts with two of these institutes.

The following facts are also known about these contracts.

- I. Vendor Z had at least one contract in every year.
 - II. Vendor X had one or more contracts in every year up to 2015, but no contract in any year after that.
 - III. Vendor Y had contracts in 2010 and 2019. Vendor W had contracts only in 2012.
 - IV. There were five contracts in 2012.
 - V. There were exactly four multi-year contracts. Institute B had a 7-year contract, D had a 4-year contract, and A and C had one 3-year contract each. The other four contracts were single-year contracts.
 - VI. Institute C had one or more contracts in 2012 but did not have any contract in 2011.
 - VII. Institutes B and D each had exactly one contract in 2012. Institute D did not have any contract in 2010.
- Q. 11.** In which of the following years were there two or more contracts ?
1. 2015
 2. 2018
 3. 2017
 4. 2016
- Q. 12.** Which of the following is true ?
1. B had a contract with Y in 2019
 2. D had a contract with X in 2011
 3. B had a contract with Z in 2017
 4. D had a contract with Y in 2019
- Q. 13.** In how many years during this period was there only one contract ?
1. 3
 2. 5
 3. 2
 4. 4
- Q. 14.** What BEST can be concluded about the number of contracts in 2010 ?
1. At least 3
 2. At least 4
 3. Exactly 4
 4. Exactly 3
- Q. 15.** Which institutes had multiple contracts during the same year ?
1. B and C only
 2. B only
 3. A only
 4. A and B only
- Q. 16.** Which institutes and vendors had more than one contracts in any year ?
1. A, D, W, and Z
 2. B, W, X, and Z
 3. A, B, W, and X
 4. B, D, W, and X

Directions (Q. 17 to 20): Read the following passage carefully and answer the questions that follows.

Ten musicians (A, B, C, D, E, F, G, H, I and J) are experts in at least one of the following three percussion instruments: tabla, mridangam, and ghatam. Among them, three are experts in tabla but not in mridangam or ghatam, another three are experts in mridangam but not in tabla or ghatam, and one is an expert in ghatam but not in tabla or mridangam. Further, two are experts in tabla and mridangam but not in ghatam, and one is an expert in tabla and ghatam but not in mridangam.

The following facts are known about these ten musicians.

1. Both A and B are experts in mridangam, but only one of them is also an expert in tabla.
2. D is an expert in both tabla and ghatam.
3. Both F and G are experts in tabla, but only one of them is also an expert in mridangam.
4. Neither I nor J is an expert in tabla.
5. Neither H nor I is an expert in mridangam, but only one of them is an expert in ghatam.

Q. 17. Who among the following is DEFINITELY an expert in tabla but not in either mridangam or ghatam ?

1. F
2. A
3. C
4. H

Q. 18. Who among the following is DEFINITELY an expert in mridangam but not in either tabla or ghatam ?

1. B
2. E
3. J
4. G

Q. 19. Which of the following pairs CANNOT have any musician who is an expert in both tabla and mridangam but not in ghatam ?

1. C and E
2. F and G
3. A and B
4. C and F

Q. 20. If C is an expert in mridangam and F is not, then which are the three musicians who are experts in tabla but not in either mridangam or ghatam ?

1. E, G and H
2. E, F and H
3. C, E and G
4. C, G and H

Directions (Q. 21 to 24): Read the following passage carefully and answer the questions that follows.

The local office of the APP-CAB company evaluates the performance of five cab drivers, Arun, Barun, Chandan, Damodaran, and Eman for their monthly payment based on ratings in five different parameters (P1 to P5) as given below:

P1: timely arrival

P2: behaviour

P3: comfortable ride

P4: driver's familiarity with the route

P5: value for money

Based on feedback from the customers, the office assigns a rating from one to 5 in each of these parameters. Each rating is an integer from a low value of 1 to a high value of 5. The final rating of a driver is the average of his ratings in these five parameters. The monthly payment of the drivers has two parts — a fixed payment and final rating-based bonus. If a driver gets a rating of 1 in any of the parameters, he is not eligible to get bonus. To be eligible for bonus a driver also needs to get a rating of five in at least one of the parameters.

The partial information related to the ratings of the drivers in different parameters and the monthly payment structure (in rupees) is given in the table below:

	P1	P2	P3	P4	P5	Fixed payment	Bonus
Arun				4		₹1000	₹250 × Final Rating
Barun	3					₹1200	₹200 × Final Rating
Chandan			2			₹1400	₹100 × Final Rating
Damodaran		3				₹1300	₹150 × Final Rating
Eman					2	₹1100	₹200 × Final Rating

The following additional facts are known.

1. Arun and Barun have got a rating of 5 in exactly one of the parameters. Chandan has got a rating of 5 in exactly two parameters.
2. None of drivers has got the same rating in three parameters.

- Q. 21.** If Damodaran does not get a bonus, what is the maximum possible value of his final rating ?
 1. 3.8 2. 3.6
 3. 3.4 4. 3.2
- Q. 22.** If Eman gets a bonus, what is the minimum possible value of his final rating ?
 1. 2.8 2. 3.4
 3. 3.0 4. 3.2
- Q. 23.** If all five drivers get bonus, what is the minimum possible value of the monthly payment (in rupees) that a driver gets ?
 1. 1740 2. 1750
 3. 1600 4. 1700
- Q. 24.** If all five drivers get bonus, what is the maximum possible value of the monthly payment (in rupees) that a driver gets ?
 1. 1950 2. 2050
 3. 1900 4. 1960

Quantitative Aptitude (QA)

- Q. 1.** An alloy is prepared by mixing three metals A, B and C in the proportion 3 : 4 : 7 by volume. Weights of the same volume of the metals A, B and C are in the ratio 5 : 2 : 6. In 130 kg of the alloy, the weight, in kg, of the metal C is :
 1. 84 2. 70
 3. 48 4. 96
- Q. 2.** A person spent ₹50000 to purchase a desktop computer and a laptop computer. He sold the desktop at 20% profit and the laptop at 10% loss. If overall he made a 2% profit then the purchase price, in rupees, of the desktop is :
- Q. 3.** If a , b and c are positive integers such that $ab = 432$, $bc = 96$ and $c < 9$, then the smallest possible value of $a + b + c$ is :
 1. 46 2. 56
 3. 49 4. 59
- Q. 4.** Among 100 students, x_1 have birthdays in January, x_2 have birthdays in February, and so on. If $x_0 = \max(x_1, x_2, \dots, x_{12})$, then the smallest possible value of x_0 is :
 1. 12 2. 10
 3. 8 4. 9
- Q. 5.** If $\log_4 5 = (\log_4 y)(\log_6 \sqrt{5})$, then y equals:
- Q. 6.** Two persons are walking beside a railway track at respective speeds of 2 and 4 km per hour in the same direction. A train came from behind them and crossed them in 90 and 100 seconds, respectively. The time, in seconds, taken by the train to cross an electric post is nearest to :
 1. 78 2. 87
 3. 75 4. 82
- Q. 7.** A solution, of volume 40 litres, has dye and water in the proportion 2 : 3. Water is added to the solution to change this proportion to 2 : 5. If one-fourths of this diluted solution is taken out, how many litres of dye must be added to the remaining solution to bring the proportion back to 2 : 3 ?
- Q. 8.** If $f(5 + x) = f(5 - x)$ for every real x , and $f(x) = 0$ has four distinct real roots, then the sum of these roots is :
 1. 40 2. 10
 3. 20 4. 0
- Q. 9.** If y is a negative number such that $2y^{2\log_3 5} = 5^{\log_2 3}$, then y equals :
 1. $\log_2(1/3)$ 2. $-\log_2(1/5)$
 3. $-\log_2(1/3)$ 4. $\log_2(1/5)$
- Q. 10.** How many distinct positive integer-valued solutions exist to the equation $(x^2 - 7x + 11)(x^2 - 13x + 42) = 1$?
 1. 2 2. 4
 3. 8 4. 6
- Q. 11.** How many 3-digit numbers are there, for which the product of their digits is more than 2 but less than 7 ?
- Q. 12.** Veeru invested ₹10000 at 5% simple annual interest, and exactly after two years, Joy invested ₹8000 at 10% simple annual interest. How many years after Veeru's investment, will their balances, i.e., principal plus accumulated interest, be equal ?
- Q. 13.** A gentleman decided to treat a few children in the following manner. He gives half of his total stock of toffees and one extra to the first child, and then the half of the remaining stock along with one extra to the second and continues giving away in this fashion. His total stock exhausts after he takes care of 5 children. How many toffees were there in his stock initially ?

Q. 14. The number of distinct real roots of the equation

$$\left(x + \frac{1}{x}\right)^2 - 3\left(x + \frac{1}{x}\right) + 2 = 0 \text{ equals:}$$

Q. 15. On a rectangular metal sheet of area 135 sq in, a circle is painted such that the circle touches two opposite sides. If the area of the sheet left unpainted is two-thirds of the painted area then the perimeter of the rectangle in inches is :

1. $5\sqrt{\pi}\left(3 + \frac{9}{\pi}\right)$ 2. $3\sqrt{\pi}\left(5 + \frac{12}{\pi}\right)$
 3. $4\sqrt{\pi}\left(3 + \frac{9}{\pi}\right)$ 4. $3\sqrt{\pi}\left(\frac{5}{2} + \frac{6}{\pi}\right)$

Q. 16. A straight road connects points A and B. Car 1 travels from A to B and Car 2 travels from B to A, both leaving at the same time. After meeting each other, they take 45 minutes and 20 minutes, respectively, to complete their journeys. If Car 1 travels at the speed of 60 km/hr, then the speed of Car 2, in km/hr, is:

1. 90 2. 70
 3. 100 4. 80

Q. 17. The area of the region satisfying the inequalities $|x| - y \leq 1$, $y \geq 0$ and $y \leq 1$ is

Q. 18. A train travelled at one-thirds of its usual speed, and hence reached the destination 30 minutes after the scheduled time. On its return journey, the train initially travelled at its usual speed for 5 minutes but then stopped for 4 minutes for an emergency. The percentage by which the train must now increase its usual speed so as to reach the destination at the scheduled time, is nearest to

1. 58 2. 67
 3. 50 4. 61

Q. 19. The number of real-valued solutions of the equation $2^x + 2^{-x} = 2 - (x - 2)^2$ is

1. infinite 2. 0
 3. 2 4. 1

Q. 20. A circle is inscribed in a rhombus with diagonals 12 cm and 16 cm. The ratio of the area of circle to the area of rhombus is :

1. $\frac{3\pi}{25}$ 2. $\frac{2\pi}{15}$
 3. $\frac{6\pi}{25}$ 4. $\frac{5\pi}{18}$

Q. 21. A solid right circular cone of height 27 cm is cut into two pieces along a plane parallel to its base at a height of 18 cm from the base. If the difference in volume of the two pieces is 225 cc, the volume, in cc, of the original cone is :

1. 264 2. 256
 3. 232 4. 243

Q. 22. In a group of people, 28% of the members are young while the rest are old. If 65% of the members are literates, and 25% of the literates are young, then the percentage of old people among the illiterates is nearest to :

1. 59 2. 55
 3. 62 4. 66

Q. 23. If $x = (4096)^{7+4\sqrt{3}}$, then which of the following equals 64 ?

1. $\frac{x^{\frac{7}{2}}}{x^{2\sqrt{3}}}$ 2. $\frac{x^7}{x^{2\sqrt{3}}}$
 3. $\frac{x^7}{x^{4\sqrt{3}}}$ 4. $\frac{x^{\frac{7}{2}}}{x^{\frac{4}{\sqrt{3}}}}$

Q. 24. The mean of all 4-digit even natural numbers of the form 'aabb', where $a > 0$, is

1. 4864 2. 5050
 3. 5544 4. 4466

Q. 25. Leaving home at the same time, Amal reaches office at 10:15 am if he travels at 8 km/hr, and at 9:40 am if he travels at 15 km/hr. Leaving home at 9:10 am, at what speed, in km/hr, must he travel so as to reach office exactly at 10 am ?

1. 14 2. 12
 3. 13 4. 11

Q. 26. Let A, B and C be three positive integers such that the sum of A and the mean of B and C is 5. In addition, the sum of B and the mean of A and C is 7. Then the sum of A and B is :

1. 6 2. 7
 3. 5 4. 4

Answer Key**Verbal Ability and Reading Comprehension (VARC)**

1. (3)	2. (4)	3. (4)	4. (2)	5. (2)	6. (3)	7. (3)	8. (4)	9. (1)	10. (3)
11. (3)	12. (2)	13. (3)	14. (4)	15. (1)	16. (4)	17. (3)	18. (4)	19. 3	20. (3)
21. 3	22. (2)	23. (3)	24. 3124	25. 3214	26. 1432				

Data Interpretation and Logical Reasoning (DILR)

1. 340	2. 10	3. 150	4. 325	5. (4)	6. (3)	7. (1)	8. (4)	9. 3	10. 4
11. (1)	12. (4)	13. (1)	14. (4)	15. (4)	16. (3)	17. (4)	18. (3)	19. (1)	20. (2)
21. (2)	22. (3)	23. (4)	24. (4)						

Quantitative Aptitude (QA)

1. (1)	2. 20000	3. (1)	4. (4)	5. 36	6. (4)	7. 8	8. (3)	9. (1)	10. (4)
11. 21	12. 12	13. 62	14. 1	15. (2)	16. (1)	17. 3	18. (2)	19. (2)	20. (3)
21. (4)	22. (4)	23. (1)	24. (3)	25. (2)	26. (1)				

CAT 2020

SHIFT-1

SOLVED
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Answers and Explanations

Verbal Ability and Reading Comprehension (VARC)

1. **Option (3) is Correct.**

Explanation: The question asks to identify the idea which the author is most likely to support. Options (1), (2) and (4) are out rightly ruled because the author is not against the use of rhetoric or critical of grammar rules. In the passage the author asserts that writers should follow the rules of grammar. Unless they are certain that they are doing well. So, the author is most likely to be supportive of a tool that helps writers with grammar rules. (3) talks of 'language software' that will standardize the rules of grammar. Hence, option (3) is the correct answer.

2. **Option (4) is Correct.**

Explanation: As per the passage, grammar is base of a language. When grammar rules are not followed, it results in confusion. So, the main concern of the passage is best expressed by the line "bad grammar produces bad sentences." Options (1) and (2) focus upon specific aspect of grammar. So, both are eliminated. Option (3) is a close option as it says – one might not be able to judge whether one is doing good in one's usage of language. This is also one of the author's concerns. But between (3) and (4), (4) is more generic and apt. Hence, option (4) is the correct answer.

3. **Option (4) is Correct.**

Explanation: When you rephrase the question stem, "None of the statements is similar except..." you understand that you have to select an option which is similar to the logic used in the question. Options (1) and (3) do not have any similarity with the given statement and are rightly eliminated. Option (2) states, plant an apple tree and you have an orchard, which is an exaggeration. Option (4) is similar to the statement given in the question. Hence, option (4) is the correct answer.

4. **Option (2) is Correct.**

Explanation: It is a tricky question. The right way to solve the question is to rephrase it. The question says- one statement among given, if false, will support the argument given in the question. After rephrasing it we get that we have the statement, if true, does not support the argument. According to the passage nouns and verbs are necessary parts of writing. Option (1), (3), and (4), if true, supports the argument. Option (2), if true, is the exact opposite of what the passage says. Hence, option (2) is the correct answer.

5. **Option (2) is Correct.**

Explanation: The question states- which of the statement cannot be inferred from the passage. Option (1) can be inferred from, "Must you write complete sentences each time, every time? Perish the thought", Option (3) can be inferred from, "...a sentence is, by definition, a group of words containing a subject (noun) and a predicate (verb)...", Option (4) can inferred from, "If your work consists only of fragments and floating clauses, the Grammar Police aren't going to come and take you away." Option (2) can't be inferred from the passage. Though the passage asserts that there is a comforting simplicity at the heart of grammar, yet it does not imply that the purpose of grammar is to make sentences simple. Hence, option (2) is the correct answer.

6. **Option (3) is Correct.**

Explanation: This is an easy question and must attempt question. From the penultimate paragraph it is very clear that textile is suitable for large transitions and coin is suitable for small transitions. Thus, option (4) is eliminated. Option (1) and

option (2) talk about appropriate weight of grain and equivalent value. So, both are apt decision of making the payment. Option (3) suggests- cutting of a fabric from a new bolt, which is not a sound decision because as per the second paragraph, once cut into smaller piece the value of textile lessened greatly. Hence, option (3) is the correct answer.

7. **Option (3) is Correct.**

Explanation: The passage asserts that both the modern currency system and that of Tang use different materials as currency, different currencies for different situations and the currencies fluctuate in value from time to time. Thus, options (1), (2) and (4) are eliminated. The last paragraph says that the modern currency is changing in front of our eyes, which is mentioned in option (3). But that of Tang is a matter of past. So, in this matter both are dissimilar. Hence, Option (3) is the correct answer.

8. **Option (4) is Correct.**

Explanation: The last paragraph states: "In actuality, our own currency system today has some similarities even as it is changing in front of our eyes..." From this we can easily derive option (4). Options (1), (2) and (3) are contrary to the information given in the paragraph.

9. **Option (1) is Correct.**

Explanation: In paragraph 3 author talks about reliable supply of textile, reliable quality and measurement of textile. 'Transportation' is not used when discussing textile. It is used when discussing about coins. Hence, option (1) is the correct answer.

10. **Option (3) is Correct.**

Explanation: This is a factual question. From the last line of paragraph 4 it can be inferred that the pulse rate modulation depends upon the seals, which arrive first ("At other sites, where the scientists found faster pulse rates, the opposite would have happened—seals with faster rates would have happened to arrive first"). This is implied in option (3). Hence, option (3) is the correct answer.

11. **Option (3) is Correct.**

Explanation: The last few lines of the passage answer the question: "Modern males exhibit

more individual diversity, and their calls are more complex. While 50 years ago the drumming pattern was quite simple and the dialects denoted just a change in tempo, Casey explained, the calls recorded today have more complex structures". These lines are presented in option (3). Hence, option (3) is the correct answer.

12. **Option (2) is Correct.**

Explanation: The passage states that the possible reason for the disappearance of the dialect is that "as the population continued to expand and the islands kept receiving immigrants from the original population, the calls in all locations would have eventually regressed to the average pulse rate of the founder colony". But the call tempo of the immigrant seals changed to match that of the host colony (each of which has a different dialect), then dialects would be different. Option (1) mentions exactly what happened, resulting in the disappearance of dialects. So, it is eliminated Option (3) is incorrect because this will not bring any difference in the outcome. Option (4) can be easily eliminated as the passage is all about changes in immigrant seals. Hence, option (2) is the correct answer.

13. **Option (3) is Correct.**

Explanation: In this option you have to look for a statement which can't be inferred from Le Boeuf's study.

Option (1) can be inferred from the lines of the passage: "At the individual level, the pulse of the calls stayed the same: A male would maintain his vocal signature throughout his lifetime."

From the lines: "This led Le Boeuf and his collaborator, Lewis Petrinovich, to deduce that the dialects were, perhaps, a result of isolation over time, after the breeding sites had been recolonized." Option (2) can be deduced.

Option (4) can be inferred from: In the decades that followed, scientists noticed that the geographical variations reported in 1969 were not obvious anymore."

As per the passage over time, with migrations, the calls regressed to the average pulse rate

of the founder colony in Isla Guadalupe. The passage does not indicate that the influx of new northern elephant seals into Año Nuevo Island would have made the call pulse rate of its male seals exceed that of those at Isla Guadalupe. Hence, option (3) cannot be inferred and is the correct answer.

14. Option (4) is Correct.

Explanation: The passage says that “for anarchists the state itself is the enemy and they have applied the same interpretation to the outcome of every revolution of the 19th and 20th centuries.” This is translated in option (4). Hence, option (4) is the answer. Option (1) distorts the definition of anarchism. Option (2) talks of the ‘primacy’ of the individual: while anarchy focuses upon the ‘mutualism’.

15. Option (1) is Correct.

Explanation: Options (2) and (4) are eliminated because they miss out the key topic ‘anarchism’. Out of option (1) and option (3), option (3) misses ‘freedom’ and ‘individualism’, these are mentioned in option (1). Hence, option (1) is the correct answer.

16. Option (4) is Correct.

Explanation: Option (1) can be inferred from the paragraphs 2 and 3. The last paragraph states, “there are, unsurprisingly, several traditions of individualist anarchism..”. This is rephrased in option (2). From paragraph 3 and 4: “For anarchists the state itself is the enemy...because every state keeps a watchful and sometimes punitive eye on its dissidents..”. Paragraph 3 talks about the “violence and terror” applied by centralised state power option (3) can be derived. The passage makes no mention of the mainstream mistrust of collectivism. Hence, option (4) is the correct answer.

17. Option (3) is Correct.

Explanation: The passage describes the French Revolution and states in paragraph 3 that “after every revolutionary uprising, usually won at a heavy cost for ordinary populations, the new rulers had no hesitation in applying violence and terror, a secret police, and a professional army to maintain

their control.” So, option (3) is the correct answer.

18. Option (4) is Correct.

Explanation: Option (1) is factually incorrect because it talks about ‘morally upright capitalism’, which is not discussed in the passage.

Option (2) is wrong since talks of ‘state intervention’, which is not there in the passage.

Option (3) is also incorrect because it talks of ‘altruism’, which is not discussed in the passage.

Answer to this question is in the last paragraph. The paragraph explains that individualist anarchists protect autonomy and associate with others for common advantages. The paragraph further states that these thinkers “differed from free-market liberals in their absolute mistrust of American. That is while both individualist anarchists and free-market thinkers agreed on the importance of individual autonomy; individualist anarchists distrusted capitalism and put emphasis on mutualism while free-market thinkers did not. Thus, option (4) is the correct answer.

19. Option (3) is Correct.

Explanation: (4) introduces the central idea of the paragraph- ‘slavery’. Since (4) talks about freedom of speech and existence of slavery, (1) carry forwards the idea by stating talk is the most powerful tool to maintain slavery. Sentences (2) and (5) both are about slave talks; (3) is different, as it is about the significance of oaths, orations and invocations in the societies slaves came from. Hence, option (3) is the correct answer.

20. Option (3) is Correct.

Explanation: Option (2) is incorrect because the second half is not in tandem with the paragraph. According to the paragraph the question the validity of measures used to estimate heritability, not the ways in which intelligence is inherited.

Option (4) is eliminated because it says intelligence is ‘immutable’ while the paragraph only says it is difficult to alter.

Option (3) is not as comprehensive as (1). The central idea of the paragraph is: Biologists ask if speaking of a single entity called “intelligence” is coherent and question the validity of measures used to estimate heritability of a trait in humans. Option (1) rephrases this. Hence, option (1) is the correct answer.

21. Option (3) is Correct.

Explanation: This is a bit tricky question. The only strong link you can get is a link between (5) and (4). Both talk about realization of the feminists. (5) is followed by (2), which talks about Elaine Showalter’s critique of the literary curriculum. The other possible links are (3) and (15). In (3), Both the sentences talk about androcentric literature. Though they have same subject, yet they are different in scopes. (3) talks about the ‘reading experience’ depending on the gender of the reader, (5) talks about the realization that the literary canon is androcentric. Whereas (1) and (5), both sentences relate to the question of what women read. Between (15) and (3), AE is links better to the main idea of the paragraph-- the realization by feminists that what women read has a damaging effect on women readers. So, the proper sequence can be (1542). And (3) is the odd one out. Hence, option (3) is the correct answer.

22. Option (2) is Correct.

Explanation: Options (1) and (3) do not encompass the idea of the paragraph. The paragraph is specific to the time after Soviet decline and emergent unification of Germany-- a multi-polar world. Options (1) and (3) do not talk about the specific timeline. Option (4) talks of the particular timeline but misses how Europe changed its internal structure by adjusting its differences by peaceful mechanisms.

Option (2) captures the essence of the paragraph. The paragraph describes how Europe changed its internal structure and transformed itself into a united whole using peaceful mechanism in the new multi-polar world. Hence, option (2) is the correct answer.

23. Option (3) is Correct.

Explanation: The central idea of this paragraph falls at the end of the paragraph: “Indeed, that movie scene exemplifies the

so-called “CSI effect”—the phenomenon in which judges hold unrealistic expectations of the capabilities of forensic science.” Option (c) sums up this idea aptly. Hence, option (3) is the correct answer.

Option (1) misses an important point: ‘influence of movies and series’.

Option (2) and option (4) are incorrect because they focus specifically upon voice recognition. The paragraph is more general and talks of forensic science.

24. The correct Answer is [3124].

Explanation: Statement (3) is the most generic sentence and introduces the main idea of the paragraph. Hence, (3) is an obvious opener. Sentence (1), which is about the tensions between states in South East Asia further continues the idea of the statement (3). (24) is a mandatory pair. (2) talks about the threat posed by China to South East Asian States. It follows (1). And (4) follows (2). So, the correct sequence is (3124).

25. The correct Answer is [1324].

Explanation: This is a tricky question. Statement (1) is Easy to identify as opener, because it introduces the subject of the paragraph. After (1) there a strong temptation to place (2), but placing (3) becomes a challenge then. After careful reading you will realize that (24) makes a mandatory pair. (2) talks of the declarations and (4) continues idea by talking about the “treaties” hinted in statement (2). And since (4) talks about ‘biological weapons’ and the idea of ‘biological weapon’ is introduced in statement (3). (3) will be placed before (24). So the right sequence is (1324).

26. The correct Answer is [1432].

Explanation: Sentence (1) is the best opener; because it explains you what the ‘tales’ mentioned in other sentences refer to -- nineteenth century San folktales. Sentence (1) elaborates the significance of these tales is difficult to determine. (4) follows (1) because (4) tells us how the meaning can be drawn forth. Sentence (2) mentions “shamans”-- what these are clear only from (3). (3) comes before (2). So, the right sequence is (1432).

Data Interpretation and Logical Reasoning (DILR)

Questions 1 to 14 video solutions :

Scan to know more about these answers



Answers
1 to 14

Questions 15 to 24 video solutions :

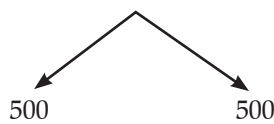
Scan to know more about these answers



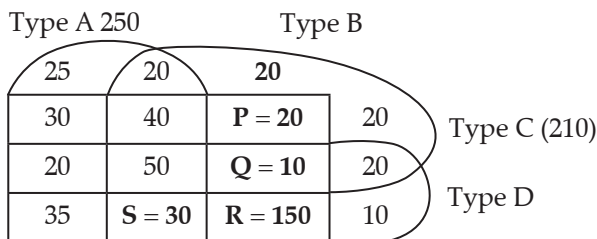
Answers
15 to 24

For Solutions 1 to 4:

1. Total Patients = 1000



Treatment Group Control Group
Some additional information is given regarding A, B, C, D Medicines.



Given 75 patients were treated exactly one type of medicine.

So, $25 + \text{Body} + 20 + 10 = 75$
 $\text{Body} = 20$

Total A = 250

where only S is missing

So, $30 + 40 + 20 + 50 + 35 + 25 + 20 + S = 250$
 $S = 30$

Give that 100 patients were treated with exactly 3 medicine. All tick boxes in Venn-diagram are common for 3 type medicine.

So, $40 + 20 + 30 + Q = 100$
 $Q = 10$

Now only one unknown left in C type

So, $20 + 20 + 10 + 40 + 50 + 30 + 20 + P = 210$
 $P = 210 - 190 = 20$

Total = 500

and A = 250

So, remaining = $500 - 250 = 250$

So, $R = 250 - [20 + 20 + 20 + 20 + 10 + 10]$

$R = 150$

1. The correct Answer is [340].

Sum of all boxes in B
 $= 20 + 20 + 40 + 20 + 50 + 10 + 30 + 150$
 $= 340$

2. The correct Answer is [10].

Number of patients who treated with medicine types B, C and D but not type A.
 $= Q = 10$

3. The correct Answer is [150].

Patients treated with medicine Type B and D only = $R = 150$

4. The correct Answer is [325].

Patients who were treated with medicine type D = sum of all boxes in D
 $= 20 + 35 + 50 + 30 + 10 + 150 + 20 + 10$
 $D = 325$

Solution for Question 5 to 10:

	Eng.	Hindi	Maths	Science	Social Science
Alva	80	75	70	75	60
Bithi	90	80	55	85	85
Carl	75	80	90	100	90
Deep	70	90	100	90	80
Esha	80	85	95	60	55
Fani	83	72	78	88	83

1. Four students appeared in each Eng, Hindi, Science and Social science.

2. If student miss exactly two exams they average of best two would be awarded in missed exam.

* Esha is only who missed one exam because didn't having same marks in two subject.

Now by average property, lowest and highest value cannot be average of given number.

So Esha can miss = Eng or Hindi or Science

By observation can be say that
If she miss English then marks of

$$\text{English} = \frac{85 + 90 + 60}{3} = 78.33$$

So Esha could miss English.

Rest any other exams cannot be missed by Esha because average and given values are not matching.

Esha missed English exam

Now starting from Alva to check which student missed only math exam.

If Alva missed, then average marks

$$= \frac{80 + 75 + 75}{3} = 76.66 (\times)$$

If Bithi missed, then average marks

$$= \frac{90 + 85 + 85}{3} = 86.66 (\times)$$

If Carl missed, then average marks

$$= \frac{80 + 100 + 90}{3} = 90 (\checkmark)$$

So Carl could be missed Math exam.

If Deep missed, then average marks

$$= \frac{90 + 90 + 80}{3} = 86.66 (\times)$$

If Foni missed, then average marks

$$= \frac{83 + 88 + 83}{3} = 84.6 (\times)$$

So, Carl missed Maths exam.

Now check which student missed Hindi and another who missed Hindi and one more. Check only Alva, Bithi, Deep and Foni now.

If Alva missed only Hindi, then average marks = $\frac{80 + 70 + 75}{3} = 75$

and if Alva missed two exams then average marks of best two = $\frac{80 + 70}{2} = 75$.

Alva can miss only Hindi or Hindi & Science.

If Bithi missed Hindi, then average marks

$$= \frac{90 + 85 + 85}{3} = 86.6 (\times)$$

If Deep missed Hindi Exam,

$$\text{then average marks} = \frac{90 + 100 + 80}{3} = 90 (\checkmark)$$

If Deep missed Hindi & Science,

$$\text{then average marks} = \frac{100 + 80}{2} = 90$$

So, Deep can miss only Hindi or Hindi and Science.

If Foni missed Hindi, then average marks

$$= \frac{83 + 88 + 83}{3} = 84.66 (\times)$$

So, by IIIrd point between Alva & Deep one missed only Hindi and other missed Hindi and Science.

Now check for Bithi & Foni.

Two students missed Eng, Hindi, Science, Social Science.

So, Bithi and Foni missed Social Science

One more student apart from Esha missed English exam.

	Eng.	Social Science
--	------	----------------

Foni	83	83	same
------	----	----	------

Now apart from Alva or Deep and one more student missed Science exam. The possibility is only Bithi.

The subject/s is/are missed by the students. (*

Alva \Rightarrow Only Hindi or Hindi & Science

Bithi \Rightarrow Science and Social Science

Carl \Rightarrow Only Maths

Deep \Rightarrow Only Hindi or Hindi & Science

Foni \Rightarrow English and Social Science.

Esha \Rightarrow Only English

5. **The correct Answer is [Carl].**
6. **The correct Answer is [Esha and Foni].**
7. **The correct Answer is [Alva & Deep].**
8. **The correct Answer is [Bithi and out of Alva & Deep].**
9. **The correct Answer is [3].**
10. **The correct Answer is [4].**

Solution for Question 11 to 15:

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
BZ	BZ	BZ	BZ	BZ	BZ	BZ	BZ	BZ	BZ
AX	AX	AX	DX	DX	DX				
			DX						
BY			CW						DY
			AW						

As 5 contract in 2012 means one of Z and X will have 2 contract.

Now if Z have two contract in 2012 means.

Z have 3 year contract from 2010 to 2012 and contract from 2012 to 2019.

So it is not possible.

But if Z have two contract in 2012. Then two contract of X from 2010 to 2012 and from 2012 to 2015.

So, it can be written as.

X has contract with D from 2012 to 2015.

C can not have in 2012. So A and X have a contract from 2010 to 2012.

As per data & multiple year contracts are there $\Rightarrow 1 \rightarrow 7$ years

1 \rightarrow 4 years

2 \rightarrow 3 years

So, 7 years contract with B and z from 2010 to 2016.

B and D have exactly one contract in 2012.

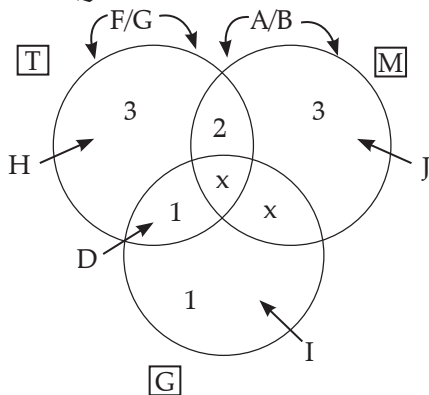
So, A and C have contract with W.

D did not have any contract in 2010.

Means B have contract with y in 2010 and D have with y in 2019.

11. Option (1) is Correct.
12. Option (4) is Correct.
13. Option (1) is Correct.
14. Option (4) is Correct.
15. Option (4) is Correct.
16. Option (3) is Correct.

Solution for Question 17 to 20:



1. 3 expert in T not in M & G.
 2. 3 expert in M not in T & G.
 3. 3 expert in G not in T & M.
 4. 2 are expert in T & M not in G.
 5. 1 is expert in T & G not in M.
- All above points are shown in Venn Diagram.
 Given that D is expert in both T & G.
 As only 1 person in Venn diagram in this area.
 So, D \rightarrow expert T & G
 As only one of A/B will be in only M region in Venn diagram and one would be in common region of T & M.
 Same for F & G. One would be in only T region and other in T & M.
 Look at I \rightarrow not expert in M
 not expert in T

So, I must be expert in G only.

J is not expert in T. So it will be in region M.

H is not expert in M. So it will be in region T.

17. Option (4) is Correct.
18. Option (3) is Correct.
19. Option (1) is Correct.
20. Option (2) is Correct.

Solution for Question 21 to 24:

	P ₁	P ₂	P ₃	P ₄	P ₅	Payment	Bonus
Arun				4		1000	250 \times PR
Barun	3					1200	200 \times PR
Chandan			2			1400	100 \times PR
Damodaran		3				1800	150 \times PR
Eman					2	1100	200 \times PR

A = Exactly one 5 star

B = Exactly one 5 star

C = Exactly two 5 star

Name of driver has got the same rating in 3 parameter.

21. Option (2) is Correct.

D is does not getting bonus.

So at one parameter = 1

And then may possible rating

= 5, 5, 4, 3, 1

$$\text{So, Average} = \frac{5+5+4+3+1}{5} = 3.6$$

22. Option (3) is Correct.

E get a Bonus. So at least one rating = 5

Rest rating = 2, 2, 3, 3

$$\text{Average} = \frac{5+2+2+3+3}{5} = \frac{15}{5} = 3$$

23. Option (4) is Correct.

Minimum possible value of rating for

$$A = \frac{5+4+2+2+3}{5} = \frac{16}{5} = 3.2$$

$$B = \frac{5+3+3+2+2}{5} = \frac{15}{5} = 3$$

$$C = \frac{5+5+2+2+3}{5} = \frac{17}{5} = 3.4$$

$$D = \frac{5+3+3+2+2}{5} = \frac{15}{5} = 3$$

$$E = \frac{5+2+2+3+3}{5} = \frac{15}{5} = 3$$

So now payments for A = $3.2 \times 250 + 1000 = 1800$

For B = $3 \times 200 + 1200 = 1800$

For C = $3.4 \times 100 + 1400 = 1740$

For D = $3 \times 150 + 1300 = 1750$

For E = $3 \times 200 + 1100 = 1700$

So, minimum payment is 1700 Ans.

24. Option (4) is Correct.

All driver get bonus then may possible rating for

$$A = \frac{5+4+4+3+3}{5} = 3.8$$

$$B = \frac{5+4+4+3+3}{5} = 3.8$$

$$C = \frac{5+5+4+4+2}{5} = 4$$

$$D = \frac{5+5+3+4+4}{5} = 4.2$$

$$E = \frac{5+5+4+4+2}{5} = 4$$

Payment for A = $3.8 \times 250 + 1000 = 1950$

B = $3.8 \times 200 + 1200 = 1960$ Ans.

C = $4 \times 100 + 1400 = 1800$

D = $4.2 \times 150 + 1300 = 1930$

E = $4 \times 200 + 1100 = 1900$

Quantitative Aptitude (QA)

Questions 1 to 13 video solutions:



Questions 14 to 26 video solutions:



1. Option (1) is correct.

Ratio of volume of metal A, B and C = 3 : 4 : 7

Ratio of weight of same value of A, B and C = 5 : 2 : 6

So Total weight ratio of A, B and C

$$= 5 \times 3 : 4 \times 2 : 7 \times 6 \\ = 15 : 8 : 42$$

So total weight of C = $130 \times \frac{42}{65} = 84$ kg

2. Correct Answer is [20000].

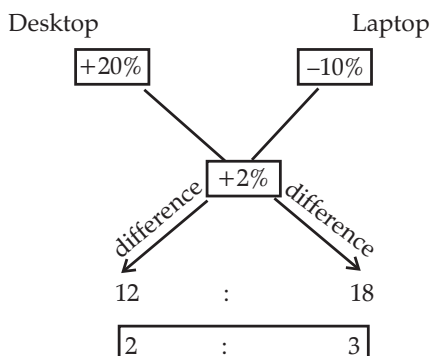
Person spends to purchase a desktop computer and a laptop = ₹50000

Sold desktop at a profit = 20%

Sold laptop at a loss = 10%

Overall profit = 2%

By mixture method:



The amount to purchase the desktop

$$= 50000 \times \frac{2}{5} = ₹20000$$

3. Option (1) is correct.

$ab = 432, bc = 96$ and $c < 9$

Possible values for C = [8] [6] [4] [2]

Then respective values for B =

[12] [16] [24] [48]

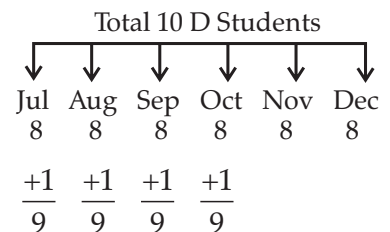
Then respective values for A =

[36] [27] [18] [9]

Possible sum $a+b+c =$ [56] [49] [46] [59]

Minimum possible sum = 46

4. Option (4) is correct.



So, smallest possible value = 9

5. Correct Answer is [36].

Given, $\log_4 5 = (\log_4 y)(\log_6 \sqrt{5})$

$$\Rightarrow \frac{\log_4 5}{\log_4 y} = \frac{1}{2} \log_6 5$$

$$\begin{aligned} \Rightarrow \log_y 5 &= \frac{1}{2} \log_6 5 \\ &\left[\log_a b = \frac{\log_x b}{\log_x a} \right] \\ \Rightarrow \frac{1}{\log_5 y} &= \frac{1}{2 \log_5 6} \\ \Rightarrow \frac{\log_5 6}{\log_5 y} &= \frac{1}{2} \Rightarrow \frac{\log_5 y}{\log_5 6} = 2 \\ \Rightarrow \log_6 y &= 2 \\ \Rightarrow y &= 6^2 = 36 \end{aligned}$$

6. **Option (4) is correct.**

Let length of train = l m
 and speed of train = s km/h
 Now, speed of Ist person = 2 km/h
 and speed of IInd person = 4 km/h
 Condition 1: Train crosses Ist man in 90 seconds and distance travelled by train its own length.

Length	Time	Speed
l	90	$(s-2)$

Condition 2 : Train crosses IInd man is 100 seconds.

Length	Time	Speed
l	100	$(s-4)$

At distance is constant in both cases. Then speed and time inversely proportional.

So, $\frac{s-2}{s-4} = \frac{100}{90}$
 $\Rightarrow s = 22$ kmph

length of train = speed \times time
 $= (s-4) \times \frac{5}{18} \times 100$
 $= \frac{18 \times 5}{18} \times 100$
 $= 500$ m

So time taken by train to cross an electric pole

$$\begin{aligned} \frac{\text{Distance}}{\text{Speed}} &= \frac{500}{22 \times \frac{5}{18}} \\ &= \frac{500 \times 18}{22 \times 5} \end{aligned}$$

Time ≈ 82 s

7. **Correct Answer is [8].**

Total volume of solution = 40 ℓ
 and dye : water = 2 : 3

Mean dye = $40 \times \frac{2}{5} = 16$

and water = 24

For making the ratio 2 : 5, 16 ℓ of water have to added in this mixture.

Now total quantity of solution
 $= 40 + 16 = 56 \ell$

After removing $\frac{1}{4}$ th solution, left solution
 $= \frac{56 \times 3}{4} = 42 \ell$

Out of 42 ℓ D : W = 12 : 30

for making it 2 : 5, 8 ℓ dye have to add

Final ratio = 12 + 8 : 30 = 20 : 30

Or 2 : 3

So, the answer is 8 ℓ of dye must be added.

8. **Option (3) is correct.**

Given $f(5+x) = f(5-x)$

and $f(x) = 0$

Put $x \rightarrow x-5$

then $f(x) = f(10-x)$

and now $f(x) = 0$ and $f(10-x) = 0$

if α is a root then

$f(\alpha) = 0$ and $f(10-\alpha) = 0$

and if β is a root then

$f(\beta) = 0$ and $f(10-\beta) = 0$

Sum of all root = $\alpha + 10 - \alpha + \beta + 10 - \beta = 20$

9. **Option (1) is correct.**

Given $2^{y^2 \log_3 5} = 5^{\log_2 3}$

$\Rightarrow (2^{\log_3 5})^{y^2} = 5^{\log_2 3}$

Property of log $\Rightarrow a^{\log b} = b^{\log a}$

then $[5^{\log_3 2}]^{y^2} = 5^{\log_2 3}$

So, $y^2 \log_3^2 = \log_2^3$

$\Rightarrow y^2 = \frac{\log_2^3}{\log_3^2}$

$\Rightarrow y^2 = (\log_2^3)^2$

$\left[\text{Property } \log_b^a = \frac{1}{\log_a^b} \right]$

$y = \pm \log_2^3$

As given y is a -ve number.

So, $y = \log_2 \left(\frac{1}{3} \right)$

10. Option (4) is correct.

$$(x^2 - 7x + 11)^{(x^2 - 13x + 42)} = 1$$

Three cakes are possible.

1. When $x^2 - 7x + 11 = 1$

$$\Rightarrow x^2 - 7x + 10 = 0$$

$$\Rightarrow (x - 5)(x - 2) = 0$$

$$\Rightarrow \text{Roots} = 5, 2$$

2. When $x^2 - 13x + 42 = 1$

$$\Rightarrow (x - 7)(x - 6) = 0$$

$$\Rightarrow \text{Roots} = 7, 6$$

3. When $x^2 - 7x + 11 = -1$

and $x^2 - 13x + 42 = \text{even}$

$$\Rightarrow x^2 - 7x + 12 = 0$$

$$\Rightarrow (x - 4)(x - 3) = 0$$

$$\Rightarrow \text{roots } x = 4, 3$$

When 4, 3 values put in $x^2 - 13x + 42$ then result would be 6 and 12 respectively. So both conditions are true.

So, total 6 positive integer solutions are possible.

11. Correct Answer is [21].

Given 3 digit number for which product must be

$$\Rightarrow \begin{matrix} 3 & 4 & 5 & 6 \end{matrix}$$

Possible (1, 1, 3) (1, 1, 4) (1, 1, 5) (1, 1, 6)

digits (1, 2, 2) (1, 2, 3)

Numbers by using digit (1, 1, 3) = 3

Numbers by using digit (1, 1, 4) = 3

Numbers by using digit (1, 2, 2) = 3

Numbers by using digit (1, 1, 5) = 3

Numbers by using digit (1, 1, 6) = 3

Numbers by using digit (1, 2, 3) = 6

$$\text{Total numbers} = 3 + 3 + 3 + 3 + 3 + 3 + 6 = 21$$

12. Correct Answer is [12].

Veeru invested 10000 at 5% simple annual interest

$$\text{After 2 year amount} = 10000 + 10000 \times \frac{10}{100}$$

$$= 11000$$

Joy invested 8000 at 10% simple annual interest difference between both amount when Joy invested = 11000 - 8000 = ₹3000

Difference between interest they are earning every year

$$= 8000 \times \frac{10}{100} - 11000 \times \frac{5}{100}$$

$$= 800 - 550 = 250$$

Time taken to cover 3000 extra amount

$$= \frac{3000}{250} = 12 \text{ years.}$$

13. Correct Answer is [62].

Start with 5th person :

$$\begin{aligned} \text{Total number of toffee given to 5}^{\text{th}} \text{ child} \\ = 1 + 1 \leftarrow 2 \end{aligned}$$

$$\begin{aligned} \text{Total number of toffee given to 4}^{\text{th}} \text{ child} \\ = 3 + 1 \leftarrow 6 \end{aligned}$$

$$\begin{aligned} \text{Total number of toffee given to 3}^{\text{rd}} \text{ child} \\ = 7 + 1 \leftarrow 14 \end{aligned}$$

$$\begin{aligned} \text{Total number of toffee given to 2}^{\text{nd}} \text{ child} \\ = 15 + 1 \leftarrow 30 \end{aligned}$$

$$\begin{aligned} \text{Total number of toffee given to 1}^{\text{st}} \text{ child} \\ = 31 + 1 \leftarrow 62 \text{ Given} \end{aligned}$$

So in starting total number of toffee = 62

14. Correct Answer is [1].

$$\left(x + \frac{1}{x}\right)^2 - 3\left(x + \frac{1}{x}\right) + 2 = 0$$

Let $x + \frac{1}{x} = y$

then $y^2 - 3y + 2 = 0$

$$y = 2 \text{ and } y = 1$$

Means $x + \frac{1}{x} = 2$ and $x + \frac{1}{x} = 1$

It is know that $a + \frac{1}{a} \geq 2$ for all $a > 0$

and $a + \frac{1}{a} \leq -2$ for all $a < 0$

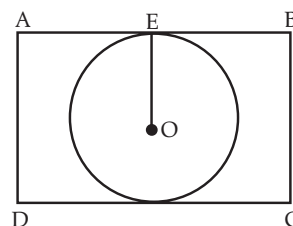
Means only $x + \frac{1}{x} = 2$ valid

and $x = 1$

15. Option (2) is correct.

Area of \square ABCD = 135

Let the area of circle = 3x



Then unpainted area = 2x

Given $3x + 2x = 135$
 $x = 27$
 Area of circle = 3×27
 $\pi r^2 = 81$
 $\Rightarrow r = \frac{9}{\sqrt{\pi}}$

So the breadth of rectangle = $2r = \frac{18}{\sqrt{\pi}}$

Area of rectangle = $L \times B = 135$

$L \times \frac{18}{\sqrt{\pi}} = 135$

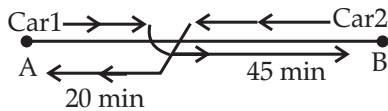
$\Rightarrow L = \sqrt{\pi} \frac{15}{2}$

Perimeter = $2[L + B]$

$= 2 \left[\frac{15\sqrt{\pi}}{2} + \frac{18}{\sqrt{\pi}} \right]$

$= 3\sqrt{\pi} \left[5 + \frac{12}{\pi} \right]$

16. Option (1) is correct.



Let speed of car 1 = S_1 and for car 2 = S_2

Then, $\frac{S_1}{S_2} = \sqrt{\frac{t_2}{t_1}}$
 $= \sqrt{\frac{20}{45}} = \frac{2}{3}$

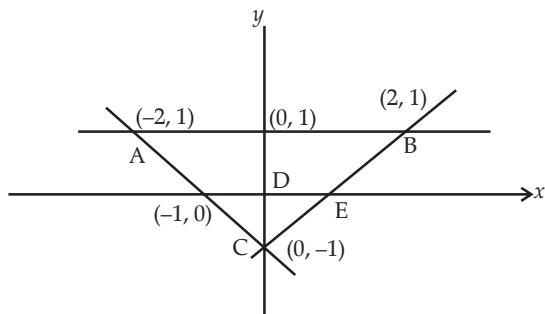
Given $S_1 = 60$ km/hr

So $\frac{60}{S_2} = \frac{2}{3}$
 $S_2 = 90$ km/hr.

17. Correct Answer is [3].

1. $y \geq 0$
2. $y \leq 1$
3. $|x| - y \leq 1$

Means $-x - y \leq 1$
 $x - y \leq 1$



Area of triangle ABC = $\frac{1}{2} \times 4 \times 2 = 4$

Area of triangle CEF = $\frac{1}{2} \times 2 \times 1 = 1$

Area of region under lines = $4 - 1 = 3$

18. Option (2) is correct.



Let usual speed of train = s

and time taken = t

We know that distance = speed \times time

As distance is constant means speed $\propto \frac{1}{\text{time}}$

	Speed	time
Given Case 1	s	t
Case 2	$\frac{s}{3}$	t_2

By equation (i) $t_2 = 3t$

and given $3t - t = 30$ min.

$\Rightarrow t = 15$ min

Now train travel 5 minutes with usual speed and then take 4 min stop. Now time left 6 min to cover the distance.

So ratio of time $\Rightarrow 10 : 6$

$\Rightarrow 5 : 3$

So now ratio of speed 3 : 5

So percentage change in speed = $\frac{2x}{3x} \times 100$
 $= 66.67\% \approx 67\%$

19. Option (2) is correct.

$2^x + 2^{-x} = 2 - (x - 2)^2$

Know fast $\Rightarrow a + \frac{1}{a} \geq 2$ if a is +ve

Square of any number is always +ve

Means $2^x + 2^{-x} \geq 2$

and $2 - (x - 2)^2 \leq 2$

only possible value

$\Rightarrow 2^x + 2^{-x} = 2 - (x - 2)^2 = 2$

But when $2 - (x - 2)^2 = 2$

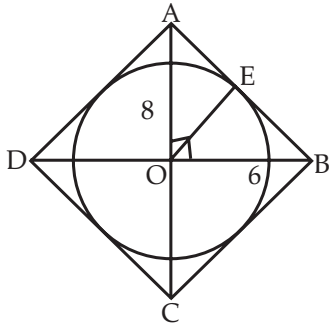
Means $x = 2$

Some time for $2^x + 2^{-x}$ is 2 only when $x = 0$.

Means no solution possible.

20. Option (3) is correct.

$OE = \frac{P.B}{H}$
 $= \frac{0.8 \times 6}{10} = 4.8$



Area of circle = $\pi \times 4.8 \times 4.8$

Area of rhombus = $\frac{1}{2} \times 12 \times 16$

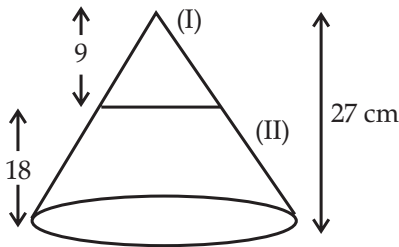
Ratio of area of circle to Rhombus

$$= \frac{\pi \times 4.8 \times 4.8}{6 \times 16}$$

$$= \frac{6\pi}{25}$$

21. Option (4) is correct.

Height of smaller cone : Height of bigger



$$h_1 : h_2$$

$$9 : 27$$

$$= 1 : 3$$

So ratio of volume of these two cone

$$C_I : C_{II} = 1^3 : 3^3$$

$$= 1 : 27$$

Given lower portion volume = 225 cc

Means $26x - x = 225$

$\Rightarrow x = 9$

So, the volume of original cone = 27K
 $= 27 \times 9 = 243 \text{ CC}$

22. Option (4) is correct.

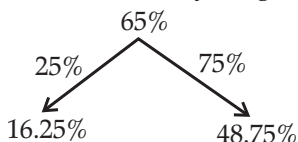
Given 28% members are young.

So 72% members are old.

Also given 65% are literates.

Means 35% are illiterates.

Given 25% of literates are young.



Out of 72% old member, 48.75% are literates

Illiterates old member = $72 - 48.75 = 23.25\%$

Percentage of old people among the illiterates

$$= \frac{23.25}{35} \times 100 = 66.42\%$$

23. Option (1) is correct.

$$x = (4096)^{7+4\sqrt{3}}$$

$$\Rightarrow (x)^{\frac{1}{7+4\sqrt{3}}} = 64^2$$

$$= (x)^{\frac{1}{2(7+4\sqrt{3})}} = 64$$

Multiply by $(7-4\sqrt{3})$ in fraction with numerator and denominator both

$$\Rightarrow \frac{1(7-4\sqrt{3})}{x^{2(7+4\sqrt{3})(7-4\sqrt{3})}} = 64$$

$$x^{\left(\frac{7-4\sqrt{3}}{2}\right)} = 64$$

$$\Rightarrow x^{\frac{7}{2}} \times x^{-2\sqrt{3}} = 64$$

$$\Rightarrow \frac{x^{\frac{7}{2}}}{x^{2\sqrt{3}}} = 64$$

24. Option (3) is correct.

Possible numbers in form of $aabb$

1100	2200	.....	9900
1122	2222	.....	9922
1144	2244	.....	9944
1166	2266	.....	9966
1188	2288	.....	9988

For each column :

As all numbers have same common difference.

So average would be 3rd number of every column like 1st column average = 1144

2nd column average = 2244

For 3rd row : Each number 1144, 2244, 3344 are having same common difference.

So average of these numbers = 5544

That will be average of all such numbers.

25. Option (2) is correct.

As distance is same, means :

Speed $\propto \frac{1}{\text{time}}$

$S_1 : S_2 = 8 : 15$

So, $T_1 : T_2 = 15 : 8$
 Given difference in time = 35 min.
 $15x - 8x = 35$ min.
 $\Rightarrow x = 15$ min
 Means when travel with 8 km/hr, then taking
 time = $15 \times 5 = 75$ min.
 So when he wants to reach office at 10 am.
 Then total time taken would be 7
 $= 5$
 $= 15 = 60$ min
 As, distance = $S_1 \times T_1$
 $= 8 \times \frac{75}{60}$
 $= 10$ km
 After leaving home at 9 : 10 he wants to reach
 in 50 min. only.
 So, speed = $\frac{10}{\frac{50}{60}}$
 $= 12$ kmph.

26. **Option (1) is correct.**

$$\text{Given } A + \frac{B+C}{2} = 5$$

$$B + \frac{A+C}{2} = 7$$

$$\text{Now } 2A + B + C = 10 \quad \dots(\text{i})$$

$$\text{and } A + 2B + C = 14 \quad \dots(\text{ii})$$

After adding (i) and (ii)

$$3(A + B) + 2C = 24 \quad \dots(\text{iii})$$

When subtracting (i) from (ii)

$$B - A = 4 \quad \dots(\text{iv})$$

From equation (iv) as $B - A$ is 4. So $A + B + C$
 can't be 4. So option (1) is not valid.

From equation (iii)

$$\underbrace{3(A+B)}_{\text{should be even}} + \underbrace{2C}_{\text{even}} = \underbrace{24}_{\text{even}}$$

Means $A + B$ must be even.

So option (2) and option (3) is not possible.

Only option (4) is possible where sum is
 given an even number.