

**INSTRUCTIONS**

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.
2. This test has a total of 100 questions in three sections: (i) Verbal Ability and Reading Comprehension –34 Questions (ii) Data Interpretation and Logical Reasoning –32 Questions and (iii) Quantitative Ability –34 Questions. The total time available for the test is **180 minutes**. However, you will be allotted exactly 60 minutes for answering the questions in each section and you cannot switch from one section to another while answering the questions in a section.
3. All questions carry three marks each. Each wrong answer to any multiple-choice type question will attract a penalty of one mark. Wrong answers to any non multiple-choice type question will not attract any penalty.

**SECTION – I**  
**Number of Questions = 34**

**DIRECTIONS** for questions 1 to 4: The passage given below is accompanied by a set of four questions. Choose the best answer to each question.

**C**olonialism began as a descriptive term and subsequently assumed a pejorative connotation. In recent times, most studies [...] have tended to confuse it with imperialism to such a degree as to blur the lines of distinction between the two. Some people have argued that neo-colonialism is a form of imperialism, but this is a specious argument because each has a distinct and separate existence.

It is necessary to discuss imperialism in the context of colonialism and to make the differences clear. For example, it is possible to be imperialistic without having colonies, but it is not possible to have colonies without being an empire. Thus, in the case of the Soviet Union, which exercised rigid controls over the economies of its small neighbours and forcefully absorbed within its structure Latvia, Lithuania, and Estonia, the Soviets practiced imperialism but not colonialism. If Stalin had succeeded in holding Manchuria under his control at the end of World War II, the Soviet Union would also have become a colonial power.

The United States, however, must be judged a colonial power because it holds American Samoa, Guam, and the Northern Mariana Islands, the last formerly held as part of the strategic Trust Territory of the Pacific. Some of the islands of the trust area were not inclined to move toward independence and sought instead territorial status, while one large area, Palau, sought first a compact of free association with the United States and in 1994 became completely independent...

A state possessing territories not incorporated within its borders, the native inhabitants of which are not granted the full rights or privileges of citizenship of the possessing state, is a colonial power. There is, however, a difference between colonizing an area and colonialism per se. For example, in the American experience, colonialism did not exist while the United States was annexing areas on the continent of North America, for the areas being colonized were recognized as territories destined to be incorporated into the United States as an integral part of the nation.

While there were numerous efforts by various presidents and secretaries of state to make the United States a colonial power in the nineteenth century, none succeeded in permanently adding territory not destined for statehood until the United States formally annexed the Midway Islands in the Pacific Ocean on 28 August 1867. This was not, however, a true colonial venture, because the American purpose was to provide a way station and fueling stop en route to the Far East. The United States made no effort to develop the islands economically or politically or to populate them with colonists. Therefore, another definition of colonialism is that there must be a conscious effort on the part of the possessing power to develop or exploit the area in the interest of the possessor and to provide some form of government or control through colonial administrative machinery. This does not mean that the colonial power must necessarily neglect or abuse the interests of the native inhabitants of the territory taken as a colony, although more often than not such neglect and abuse does occur. It does mean, however, that the colonial nation has the power to impose its rule over the area and to assert its economic pre-eminence without resistance from the inhabitants of the area.

1. According to the passage, which of the following can be inferred about the Soviet Union?  
(A) The people of Manchuria had the full rights and privileges of citizenship of the Soviet Union.  
(B) The Soviet Union incorporated the territory of Manchuria within its border without lending it full rights post World War II.  
(C) The Soviet Union was neither a colonial power nor an empire.  
(D) The Soviet Union didn't control, and neither developed nor exploited any territories outside its borders for economic self-interest.

2. According to the passage, which of the following can be inferred about the status of Guam vis-à-vis the United States?
  - (A) Guam is held by the United States illegally.
  - (B) Native inhabitants of Guam do not have the rights or privileges of the US citizenship.
  - (C) The American government does not, directly or indirectly, interfere or benefit from the administration or economic affairs of Guam.
  - (D) Guam has complete territorial autonomy.
3. All of the following can be understood from the passage EXCEPT that
  - (A) territories in the continent of North America annexed by the United States cannot be called colonies.
  - (B) territories in the continent of North America were not exploited by the United States for its own economic gain.
  - (C) inhabitants of the territories in North America that were annexed by the United States have the same rights or privileges as those of a US citizen.
  - (D) the United States lies entirely within the continent of North America.
4. Soviet Union could not have been accused of colonialism despite forcefully absorbing Latvia, Lithuania and Estonia because
  - (A) Soviet Union incorporated them within its own borders.
  - (B) the three territories were already part of the empire.
  - (C) Soviet Union didn't annex them for economic gains.
  - (D) Inhabitants of the three territories weren't given citizenship of the Soviet Union.

**DIRECTIONS** for questions 5 to 9: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

Disappearing in one place and reappearing in another. Being in two places at once. Communicating information seemingly faster than the speed of light. This kind of weird behaviour is commonplace in [...] quantum mechanics, but what might it have to do with fresh flowers, migrating birds, and the smell of rotten eggs? Welcome to what is called quantum biology.

...Still a speculative discipline, it might spark revolutions in [many industries] ...Until recently, the delicate states of matter predicted by quantum mechanics have only been accessed with the most careful experiments: isolated particles at blisteringly low temperatures or pressures, approaching that of deep space.

The idea that biology – impossibly warm, wet and messy to your average physicist – should play host to these states was almost heretical. But a few strands of evidence were bringing the idea into the mainstream, said Luca Turin of the Fleming Institute in Greece. "There are definitely three areas that have turned out to be manifestly quantum," he says. "These three things...have dispelled the idea that quantum mechanics had nothing to say about biology."

The most established of the three is photosynthesis – the staggeringly efficient process by which plants and some bacteria build the molecules they need, using energy from sunlight. It seems to use what is called "superposition" – being seemingly in more than one place at one time... [I]t appears there are little packets of energy simultaneously "trying" all of the possible paths to get where they need to go, and then settling on the most efficient.

Biology seems to have been able to use these subtle effects in a warm, wet environment and still maintain the [superposition]... The surprise [extends to] animals, too: the navigational feats of birds that cross countries, continents or even fly pole to pole present a compelling behavioural case. Experiments show that European robins only oriented themselves for migration under certain colours of light, and that very weak radio waves could completely mix up their sense of direction. Neither should affect the standard compass that biologists once believed birds had within their cells.

What makes more sense is the quantum effect of entanglement. Under quantum rules, no matter how far apart an "entangled" pair of particles gets, each seems to "know" what the other is up to – they can even seem to pass information to one another faster than the speed of light. Experiments suggest this is going on within single molecules in birds' eyes ... [like] a 'heads-up display' pilots have: an image of the magnetic field... imprinted on top of the image that they see around them.'

...Most smell researchers think the way that we smell has to do only with the shapes of odour molecules matching those of receptors in our noses. But Dr Turin believes that the way smell molecules wiggle and vibrate is responsible – thanks to the quantum effect called tunnelling. The idea holds that electrons in the receptors in our noses disappear on one side of a smell molecule and reappear on the other, leaving a little bit of energy behind in the process.

What intrigues all these researchers is how much more quantum trickery may be out there in nature. "Are these three fields the tip of the iceberg, or is there actually no iceberg underneath?" asked Dr Turin. "We just don't know. And we won't know until we go and look."

5. What does the author emphasise as 'heretical' in the line 'The idea that biology ... should play host to these states was almost heretical'?
  - (A) Finding evidence to bring the idea of quantum mechanics into mainstream discussions
  - (B) The idea that delicate states of matter accessible at low temperatures or pressures can manifest themselves in the warm, wet and messy world of biology
  - (C) Speculation that quantum biology could spark drastic changes in several industries
  - (D) That particles present only in deep space can be discovered in the biological world

6. Dr. Turin uses the expression 'no iceberg underneath' in the last para of the passage to allude to the possibility that:
- (A) quantum biology can play a major role in many industries.
  - (B) quantum biology doesn't extend beyond the three discovered phenomena.
  - (C) we may never be able to find out what lies beneath the known in quantum biology.
  - (D) we may discover that quantum biology was just trickery and nothing like quantum mechanics.
7. All of the following can be understood to be true according to the passage EXCEPT that:
- (A) energy from sunlight appears to use superposition to aid photosynthesis.
  - (B) our sense of smell may depend on the vibration of smell molecules thanks to tunnelling.
  - (C) birds use the quantum effect of entanglement to ensure their standard compass isn't affected by radio waves and certain colours.
  - (D) there is probably more to our sense of smell than just the shape of odour molecules matching nose receptors.
8. Which of the following cannot be reasonably inferred from the passage?
- (A) Most smell researchers assume that the vibrations of odour molecules do not affect the sense of smell.
  - (B) Blisteringly low temperatures aren't usually observed in biology.
  - (C) Quantum biology may explain why European robins mix up directions in the presence of radio waves.
  - (D) Photosynthesis has been witnessed outside plant life.
9. The author believes that the quantum effect of entanglement makes more sense (in para 6) because
- (A) the standard compass that biologists believed birds had doesn't explain the peculiar case of European robins.
  - (B) it is not possible for entanglement to go on within single molecules in birds' eyes.
  - (C) experiments don't prove whether birds can actually sense magnetic fields.
  - (D) entanglement doesn't explain the effect of radio waves and certain colours of light on European robins.

**DIRECTIONS** for questions 10 to 14: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

**A** century ago, linguists invented a new world map. Their research showed that a single family tree stretches its branches unbroken across most of Eurasia: from Iceland to Bangladesh, most people speak "daughter languages" [that have many similarities] descended from [a common or "mother" tongue] "Proto-Indo-European". Parallels in vocabulary and grammar quickly emerged among foreign languages, particularly in what were then the oldest preserved tongues: Latin, Greek and Sanskrit. The philologists had a theory to explain why Sanskrit, the ancient forebear of Hindi, has closer cousins in Europe than in south India: the Sanskrit word for "three" *trayas* is cognate (i.e. having the same etymological origin) with Latin *tres* and Greek *treis*, also words for "three". They speculated that at some point before the composition of the Vedas, the oldest texts of Hinduism, an Aryan (Indo-European) people had migrated into India from the north-west, while their kin pushed westward into Europe....

The presence of a long-lost common language presupposes the historical existence of a common culture which spread as the Indo-Europeans settled different areas of the world. Jacob Grimm (a Linguistics scholar) noticed a pattern in the evolution of a linguistic variant, Common Germanic as it developed out of Proto-Indo-European. The change [called the Great Consonant Shift] in Germanic languages began when a certain type of consonant called unvoiced (*p, t, k*) transformed into its aspirate equivalents (*ph, th, kh*). Consequently, what had originally been aspirates in Common Germanic (*ph, th, kh*) moved to their voiced equivalents (*b, d, g*). Thereafter, the original voiced consonants (*b, d, g*) did likewise and changed into their unvoiced counterparts (*p, t, k*), thus taking Common Germanic consonants in a full circle: from unvoiced to aspirate to voiced. Grimm showed that, even if a Germanic word and one from another Indo-European branch appeared different, they could be cognate if certain consonants had followed the change [Grimm's Law].

We can deduce the Germanic (English) word which is cognate with its Indo-European form before it underwent the Great Consonant Shift. Since Latin and Greek are Indo-European tongues which stand outside Germanic (hence not influenced by Grimm's Law), their words show the Indo-European root which Germanic inherited and changed. Because English contains many derivatives from Latin and Greek, we find within our own language, words which do not look alike but have similar meanings and are cognate....

The Indo-Europeans are at present, in strictest terms, a linguistic phenomenon, as much about their history remains uncertain... Based on calculations of the general rate at which languages change, attempts have been made to reason out how long ago Proto-Indo-European began to break apart. Such basic glottochronological methods of measuring language change are not favoured by scholars: the rate of language change can vary widely according to circumstances – languages sometimes evolve quickly or slowly – and this is unpredictable. Advanced glottochronological studies would be required. The original Indo-European culture certainly existed at some time between 5000-2000 BCE, but such a wide range is not very helpful to those trying to assess the Indo-Europeans' role in history or tie them to particular developments in a certain age. Where they lived is no less difficult to assess and this is called the homeland problem.

Though many questions about the Indo-Europeans remain unanswered, many features can be reconstructed by comparing similar elements found widely among its daughter civilizations. In Proto-Indo-European society, there were special words for the bride's parents because the "family" meant the groom's family... That some Indo-European

languages share a base that means "king" (\**reg-*, cf. English *regal*) suggests the Indo-Europeans knew about "kings". They had cows (\**gwous*), sheep, pigs, and dogs. They lived in villages (\**weik-*, cf. English *vicinity*), knew about silver and copper, relied on iron instead of bronze, had ships (\**nau-*, cf. *nautical*) and rode horses (\**ekwo-*, from which we get *equestrian*). They buried their people in funeral mounds (*kurgans*). All of these are absent from the later Indus settlements. That common words for other things ("ocean," "bronze," and "gold") do *not* show up in Indo-European daughter languages suggests the Proto-Indo-Europeans did not know about or have contact with these things.

10. What is the purpose for the author's mention of the example of Sanskrit in the first para of the passage?
  - (A) To prove that more than half the people of the modern world speak languages descended from "Proto-Indo-European".
  - (B) To highlight that it is among the world's oldest languages and has given rise to new tongues.
  - (C) To propose a possible theory for Sanskrit sharing many cognates with Latin and Greek.
  - (D) To argue that no philologist could examine the language and its close cousins Latin and Greek without believing them to be the only descendants of a common source.
11. Which of the following, if true, will strengthen the view "The presence of a long-lost common language presupposes the historical existence of a common culture" (para 2)?
  - (A) Anthropologists have shown that unity of culture nearly always accompanies unity of language throughout history.
  - (B) Fundamental similarities in the cultures of the Indo-Europeans overshadow their superficial differences.
  - (C) Language and culture are mutually exclusive but they together forge a cohesive national identity setting a people apart.
  - (D) Linguists have frequently observed commonalities in languages associated with and transcending different cultural identities.
12. Which of the following can be extrapolated from the discussion about "the great consonant shift" in the passage?
  - (A) While similarities are still visible between the modern descendants and the relatives of the ancient "Proto-Indo-European" language, the differences have increased over time.
  - (B) Even if a Germanic word and one from a different branch of Indo-European didn't look alike on the surface, they could be shown to be cognate with each other if one assumed that certain Germanic consonants had not undergone the great consonant shift.
- (C) One should be able to decipher an English word which has the same basic meaning and Greek or Latin root as a Greek or Latin word but looks different because the Greek or Latin root word has undergone the great consonant shift.
- (D) One should be able to decipher an English word which has the same basic meaning and Indo-European root as an Indo-European word but looks different because the Indo-European root word has undergone the great consonant shift.
13. Which of the following additional studies would least help in reducing the uncertainty about the Proto-Indo-European history mentioned in the passage?
  - (A) A time-line study that pinpoints the exact time when the use of kurgans and horse domestication had begun in Indo-European societies.
  - (B) An advanced glottochronological study that provides accurate details of the time it took for Indo-European daughter languages to form from the Proto-Indo-European language.
  - (C) A historical linguistic study involving dispersion patterns among Indo-European languages throwing light on the migrational paths followed by the Indo-Europeans which can be traced backwards to Proto-Indo-European society.
  - (D) A cultural study of Sanskrit texts indicating that the culture of the Indo-Europeans has different traits from the original Indus settlements.
14. When the author of the passage mentions that "basic glottochronological methods of measuring language change are not favoured by scholars", he implies that
  - (A) they offer wellfounded but incomplete or poorly supported hypotheses.
  - (B) their hypotheses are not only difficult to articulate but also contrary to recent research.
  - (C) what they offer are but an apology for a hypothesis.
  - (D) their hypotheses are plausible but poorly substantiated.

**DIRECTIONS** for questions 15 to 19: The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

The British Museum is putting on a big Hokusai exhibition this summer and about time too, for we know a lot less about this genius than we should. As the exhibition's subtitle "Beyond The Great Wave" suggests, Hokusai is famous today for just one of his designs, when in reality his art deserves to be looked at like that of Van Gogh or Rembrandt: as a richly developing and complex oeuvre of great human profundity.

The reason we don't look beyond The Great Wave enough, in spite of Hokusai's influence on modern art, is quite simply that European ideas of artistic genius have found ways to subtly belittle the individuality of non-European artists. Even though the works of Hokusai made a huge impact in France from the 1850s onwards, they were seen as "*japonaiserie*" and became raw material for avant-garde artists to rifle for ideas. One Japanese artist is much like another in the western imagination. Hokusai, Hiroshige, or Utagawa Kuniaki II, whose art is pinned to the wall in Emile Zola's study in Manet's 1868 portrait of him, all became source material for the first modernists without much attention being paid to the separate personalities of these woodcut masters.

That's not entirely fair. Van Gogh, for one, genuinely revered these Japanese artists and carefully copied works by Hiroshige. There's nothing to suggest he saw himself as inherently more important as a painter than his Japanese inspirations. Yet every detail of Van Gogh's life is studied or made into films, while most people today probably know as little about the lives of the great woodblock artists as a Victorian might have.

Just as women were long excluded from the western canon of artistic genius, so were non-European artists, even when their work was valued. Japan's great artists of the 18th and early 19th centuries were seen as artisans whose art reflected a tradition rather than expressing unique individual visions of the world...

What makes Hokusai a great artist is the same thing that sets apart all the most universal and enduring art. He captures the human condition. That print of people shivering in a gust of wind combines – to take two of his British contemporaries – Turner's feel for nature with Jane Austen's sense of social comedy. This mixture of the comic and sublime is absolutely typical of Hokusai and totally at odds with European art that tends to keep them separate. You don't see William Hogarth painting a wintry landscape, or Caspar David Friedrich making jokes. Hokusai can be serious and humorous at the same time. His theme is the world, and he sees the artist's role as to observe and distil it.

Hokusai watches people with compassion, tolerance and curiosity as they balance on precarious bridges, hike through snow, brave the sea in boats or make love in Edo's brothels. Whether he is portraying the mystery of Mount Fuji or exploring sexuality in his Shunga prints, he always has this frank, wise, accepting eye for the strangeness of life. He is a philosopher who sees human beings not as solitary, but social animals. Most of all, he is a visionary of acceptance who urges us to enjoy being alive. The genius of Hokusai can help us to be happy, wise and free – like people enjoying a sudden gust of wind.

15. Which of the following can be inferred from the passage?
  - (A) The European idea of artistic genius was too myopic to include Japanese artists.
  - (B) Hokusai, Hiroshige and Utagawa Kuniaki II had similar styles as artists.
  - (C) Van Gogh's estimation of his own art exceeded his estimation of Japanese artists he had copied from.
  - (D) Emile Zola is one of the earliest modernists to learn from Japanese artists.
16. All of the following are characteristic of Hokusai's work EXCEPT that:
  - (A) it is based on an observation of people's lives.
  - (B) it is profound yet witty.
  - (C) it borrows themes from the world around us.
  - (D) it urges humans to show compassion and tolerance.
17. Which of the following doesn't represent a shift in perspective that the author of the passage will most likely approve of?
  - (A) A greater appreciation of non-European and women artists.
  - (B) A greater appreciation of the inherent individuality on display in the art of different Japanese artists.
  - (C) A wider awareness of the personalities of woodcut masters who inspired the avant-garde artists.
  - (D) An acknowledgement of the fact that Japanese artists had started the modernist movement in art.
18. The primary distinction between Hokusai's art and European art is that
  - (A) the latter doesn't blend multiple themes into one.
  - (B) the latter doesn't take humorous art seriously.
  - (C) the former sacrifices neither profundity nor wit.
  - (D) the former transcends humour to convey something beautiful.
19. The term '*japonaiserie*' most likely represents
  - (A) Japanese art that was credited for inspiring a generation of avant-garde artists.
  - (B) the work of Japanese artisans sans a nod for their uniqueness.
  - (C) the collective amalgamation of Japanese ideas in the western imagination.
  - (D) Japanese art that had an impact on European artists.

**DIRECTIONS for questions 20 to 24:** The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

The last few years have seen a flurry of interest in the work of three Roman Stoic philosophers - Seneca, tutor to the Emperor Nero, Epictetus, a former slave, and Marcus Aurelius, himself the emperor.

Stoicism holds that the key to a good, happy life is the cultivation of an excellent mental state, which the Stoics identified with virtue and being rational. The ideal life [incorporates] an attitude of calm indifference towards external events. It was founded around 300BC by Zeno, who used to teach at the site of the Painted Stoa in Athens, hence the name Stoicism.

So, what were the ideas? Two foundational principles can be found in the Handbook, a short work summarising the ideas of Epictetus. First, some things are within our control and some are not, and that much of our unhappiness is caused by thinking that we can control things that, in fact, we can't.

What can we control? Epictetus argues that we actually control very little. We don't control what happens to us, or what the people around us say or do, and we can't even fully control our own bodies. The only thing that we really control is the judgements we make about things.

This leads us to the second foundational principle; it's not things that upset us, but how we think about things. Stuff happens. We then make judgements about what happens. Things in themselves are value-neutral, for what might seem terrible to us might be a matter of indifference to someone else, or even welcomed by others. It's the judgements we make that introduce value into the picture, and it's those value-judgements that generate our emotional responses. These value-judgements are the one thing over which we have complete control. The paradox of Stoicism, as Epictetus formulates it, is that we have almost no control over anything, yet at the same time we have potentially complete control over our happiness.

This might seem to understate the challenges that people face in their daily lives. How can just thinking differently help someone who is struggling to put food on their table, for instance? The Stoics didn't shy away from this.

Seneca knew this all too well: he suffered exile, multiple bereavements, and was ultimately forced to commit suicide by Nero. He also knew that it was all too easy to say "I'm not going to let these external things disturb me" but quite another to follow it.

So, the Stoics developed a whole series of practical exercises designed to help train people to incorporate Stoic ideas into their daily lives. Seneca recommended taking stock at the end of each day. By noting his mistakes, he hoped to do better the next day.

Marcus Aurelius ... [reminded] himself each morning that he was probably going to encounter a lot of angry, stressed, impatient, ungrateful people during the coming day. By reflecting on this in advance, the hope was that he would be less likely to respond in kind. But he also reflected on the fact that these people were just the victims of their own mistaken judgements.

Here we get another paradox: no one chooses to be unhappy, stressed, angry, miserable, and yet these are in fact all the product of our judgements, the one thing within our control.

20. The 'paradox' referred to in the last para of the passage is that:
- everyone wants to be happy, but no one really is.
  - everyone chooses to be unhappy without knowing it.
  - no one chooses unhappiness and yet, everyone attracts it.
  - our own judgments are responsible for the unhappiness we never wanted to choose.
21. The strategies used by Seneca and Marcus Aurelius to attain stoicism differ in that:
- while the former reflected on how things panned out, the latter prepared mentally for what could possibly happen.
  - while the former empathized with people, the latter learnt to correct himself.
  - while the former expected things not to go one's way, the latter avoided worrying about things to come.
  - while the former focused on restraint, the latter focused on retrospection.
22. According to the author, the 'paradox of Stoicism' seems to understate the challenges that people face in their daily lives because:
- it asserts that thinking lies at the root of all the misery we feel.
  - not letting external things disturb you is an art difficult to master.
  - there are practical exercises that help even the poor people not feel miserable.
  - it is difficult to control our thinking when we are barely able to make ends meet.
23. Stoicism can be attained through all of the following EXCEPT.
- a cultivation of rationality.
  - the belief that happiness depends on one's mental state.
  - a calm indifference towards external events.
  - a way of overcoming the challenges that people face in their daily lives.
24. The author mentions Seneca's exile and bereavements to highlight that:
- Seneca was a troubled man whose philosophies hold no value.
  - Seneca became stoical because of the problems he has faced in his life.
  - Seneca didn't give empty advice without understanding the challenges of daily life.
  - Seneca thought it was very easy to stop external things from disturbing him.
- DIRECTIONS for question 25:** Five sentences related to a topic are given in the question below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.
25. (1) That which exists possesses identity; he could keep it out of existence by refusing to identify it.  
 (2) Hatred, fuelled by the throbbing in his head, began to take form in his chest, as if summoned by the bells, and filled his consciousness and flung him blindly into action.  
 (3) It was this shape that the screams were now tearing away from him; he felt as if the ringing ceased to be sounds and became a succession of slashes hitting his skull.  
 (4) He knew that those pleas for help were not addressed to him, but to an entity whose shape he had stolen.  
 (5) The screaming of the telephones went on through the silence.



**DIRECTIONS** for question 26: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.

26. The compass we use to navigate life needs to be educated from an early age. The arts, including Plato's dialogues, help to educate our navigational sense. They don't tell us what is good or bad. Things aren't that simple. Instead, we need to develop a sense for judging what may be right or not in any particular situation. Or we may have a general sense but need to learn how to apply this general sense to specific, unique, situations. In every new situation we have to figure out what the right thing to do is. And it will be different for different people as well. Too often we look for a one-size-fits-all solution, including for our sense of right and wrong. And this is where we so often end up resorting to a violent 'solution'.

- (A) Violent solutions are the consequence of a fallacious belief that our moral compass can be educated to help us judge what is right and what is wrong.
- (B) Every situation demands a unique solution, and not even the arts can guide us in judging what is good and what is bad.
- (C) The arts, while being helpful with decision-making, don't educate us about right and wrong, and it is the individual choices, while applying the general sense to a specific situation, which can prevent mishaps.
- (D) Looking for a generic answer may lead to adverse consequences especially when what's right or wrong is unique to every situation, and individuals should learn to judge that for themselves.

**DIRECTIONS** for question 27: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the ii put box given below the question.

27. (1) A *Kkondae* is quick to criticise but will never admit his mistakes.
- (2) *Kkondae* is a modern word of unknown origin – perhaps an adaptation of the English word "condescend".
- (3) In South Korea, where the word is applied to everyone from narcissistic bosses to overbearing uncles and corrupt politicians, there are websites offering tests of *kkondae*-ness and tips on how to avoid the condition.
- (4) It means an older person who expects unquestioning obedience from juniors and who retaliates when people challenge his authority.

**DIRECTIONS** for question 28: Five sentences related to a topic are given in the question below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

28. (1) The Knights Templars' shocking demise dominates our memory of an order that was, in its day, better known by Ibn al-Athir's assessment: "The fiercest fighters of all the Franks."

- (2) Had they established themselves as the rulers of Cyprus when they had the chance in 1191, their history might have been different.
- (3) The answer to why the Templars fell partly lies in the weakness of their last master, James of Molay and partly in the cruel caprice of Philip IV.
- (4) The Templars were famed for their bravery, dedication and piety but these were not enough to save them when Philip IV attacked.
- (5) But what is seldom noted is that the Templars, for all their wealth and privilege, never established for themselves a geographical base that they could defend against all assaults, even from their own side.

**DIRECTIONS** for question 29: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.

29. What people usually mean when they call something an allegory today is that the fictional work in question can function as a metaphor for some real-world situation or event. This is a common arts journalist's device: finding a political parallel to whatever you are reviewing is a handy way to make it appear worth writing about in the first place. But an allegory is not just another word for a metaphor. In essence, it's a form of fiction that represents immaterial things as images. It calls attention to what it's doing, typically by giving those images overtly thematic labels, like presenting the Seven Deadly Sins as a procession of people named Lust, Sloth, Pride etc. An allegory is not merely an equation to be solved, leaving you free to "throw aside the allegorical imagery as something which has now done its work." "It is not enough," Lewis writes, "to see that the dreamer gazing into the fountain signifies the lover first looking into the lady's eyes. We must feel that the scene by the fountain is an imaginative likeness of the lover's experience; view the sparkling water and shining eyes concurrently and recognize them to be facets of a singular, layered understanding that includes the recognition of other, abstract qualities as well, such as the purity of her spirit."

- (A) Today, the meaning of the word 'allegory' has drifted so far that even works that aren't especially metaphorical get labeled as allegorical; but great allegorical works of the past impose a single, conspicuous interpretation on a reader and prescribe the direction of the work's commentary.
- (B) An allegory, which uses imagery to represent material things, is not a mere metaphor because it fosters a deeper understanding of the imagery.
- (C) Not everything that is written is worth reviewing; calling a political parallel an allegory serves to make a near metaphorical comparison more forceful.
- (D) While the distinction between allegory and metaphor might seem obscure to many, experts know that allegorical reading requires sustaining both image and meaning in the reader's mind, as equally valued components of the work.



**DIRECTIONS** for question 30: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

30. (1) Those epidemics involved relatively straightforward and simple things – a product and a message.  
 (2) This idea of crime, as an epidemic, it must be said, is a little strange.  
 (3) Crime, on the other hand, isn't a single discrete thing, but a word used to describe a varied and complicated set of behaviours having serious consequences.  
 (4) We talk about "epidemics of violence" or crime waves, but it's not clear we believe that crime follows the same rules of epidemics as, say Hush Puppies did, or Paul Revere's ride.

**DIRECTIONS** for question 31: Five sentences related to a topic are given in the question below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

31. (1) Intuition and imagination are why children are natural philosophers par excellence.  
 (2) Because young children have not yet developed standard cognitive skills to express themselves, they use their imagination, and they rely on it to convey their understanding of the world.  
 (3) Imagination is also the language of fairy tales, legends and myths.  
 (4) It reaches far into the world beyond the evidence of our senses and is therefore philosophical in scope.  
 (5) Imagination is the language of intuitive knowledge, springing from our inborn relationship with the world.

**DIRECTIONS** for question 32: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper order for the four sentences and key in the sequence of four numbers as your answer, in the input box given below the question.

32. (1) Interestingly, the most widespread, concerted and effective way to fight back against the historical white supremacist Viking genealogy has come not from academics or journalists.  
 (2) Communities of colour have in the past fought white supremacist medieval narratives at the grassroots by spreading their own counternarratives, from W.E.B. Du Bois creating an African-American vision of the medieval past in *Dark Princess* to the Asian Americans who pushed back against racist medievalism during the period of Chinese Exclusion.

- (3) It has come, instead, from Taika Waititi, the indigenous Maori director and writer, whose movie, *Thor: Ragnarok* — in which Thor's hammer, a medieval item regularly brandished by extremists, is destroyed — was a multiracial and postcolonial counter-narrative to the white Viking narrative circulating through the alt-right digital ecosystem.  
 (4) Scholars and historians — not just medievalists — must also interrogate their disciplines from the inside, setting the record straight about medieval race and the Global Middle Ages.

**DIRECTIONS** for question 33: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.

33. Since the time of Darwin, the human language capacity has been a perennially cited paragon of extreme complexity that defies the explanatory powers of natural selection. And it is not just critics of Darwinism who have argued that this most distinctive human capacity is problematic. Alfred Russel Wallace — the co-discoverer of natural selection theory and in many ways more of an ultra-Darwinian than Darwin himself — famously argued that the human intellectual capacity which makes language possible, is developed to a level of complexity that far exceeds what is achievable through natural selection alone. And Charles Lyell — who personally promoted Darwin's work — also opined: Not only are the vast vocabulary and baroquely structured grammar and syntax of even the most simple of natural languages orders of magnitude more complex than any other species' communication system, but the capacity this all provides for expressing esoteric concepts and conveying aesthetic experiences seems far removed from anything with direct adaptive consequence.  
 (A) Several Darwin supporters and critics have fretted over the possibility that a direct relationship between natural selection and exaggerated functional complexity of language exists in nature but it needs more empirical evidence.  
 (B) To explain the origin of the highly structured human-unique adaptation inevitably requires addressing Wallace's challenge concerning the complexity and apparent non-adaptive aspects of several features.  
 (C) Natural selection fails to explain the exaggerated functional complexity of language as observed by several supporters and critics of Darwinism.  
 (D) Contradicting the previous optimism, later researchers have proved beyond doubt that there is no consistent relationship between natural selection and exaggerated functional complexity of language in nature.



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

34. (1) On the basis of this description alone, it would be hard to guess that 'Fleabag' is in fact a comedy, perhaps even a romantic one.  
 (2) 'Fleabag' is at once a very funny story about unhappiness as well as an unhappy story about what resists being staged for laughs, less a work of comedy than of confession.  
 (3) Indeed, the bawdiness and wit are cranked so high that they can easily distract a viewer from the disturbing undercurrents of shame and guilt that give the narrative its energy and stakes.  
 (4) Certainly, while 'nothing is funnier than unhappiness,' unhappiness just by itself is not usually all that funny.

**SECTION – II**  
**Number of Questions = 32**

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

Lokesh, a science teacher, conducted an exam which was attempted by exactly eight students, A through H. The score of any student is an integer from 0 to 100. After the evaluation, Lokesh gave the following scores to the students and ranked them from 1 to 8 in the descending order of their scores:

| Student | A  | B  | C  | D  | E  | F  | G  | H  |
|---------|----|----|----|----|----|----|----|----|
| Score   | 64 | 78 | 43 | 39 | 83 | 60 | 52 | 92 |

However, after the students received their scores, some of them approached Lokesh and asked that their papers be re-evaluated. Lokesh re-evaluated their responses and the scores of all the students who approached him increased after re-evaluation. Further, the scores of none of the other students changed after re-valuation.

The following information is known about the scores of all the eight students after the re-evaluation:

- (i) The scores of no two students were the same.
- (ii) The rank of any student after the re-evaluation was not the same as that before the re-evaluation.
- (iii) The total increase in the scores of all the students was not more than 50.

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

1. If exactly two students approached Lokesh for re-evaluation, the increase in the scores of all the students who approached Lokesh is at least

2. What is the minimum possible increase in the scores of all the students who approached Lokesh for re-evaluation?

**DIRECTIONS** for questions 3 and 4: Select the correct alternative from the given choices.

3. If the total increase in the scores of all the students who approached Lokesh for re-evaluation is the minimum possible, what is the highest percentage increase in the score of any student?  
 (A) 12.8% (B) 19.2% (C) 22.0% (D) 25.0%
4. If exactly three students approached Lokesh for re-evaluation, what is the maximum possible increase in the score of any student who approached Lokesh?  
 (A) 41 (B) 44 (C) 45 (D) 39

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

Kiran has seven friends, A through G, and he was planning to go on a vacation with one or more of them. He planned to form a group comprising at least two persons from among the seven and take them with him on the vacation. Further, he wanted to visit one or more cities among Los Angeles, Paris, Istanbul, Kathmandu, Udaipur, Berlin and Addis Ababa. Any person who is part of the group that Kiran forms must visit (along with the group) all the cities that Kiran selects for the vacation.

Further, it is known that Kiran will select the group and the cities to visit based on the following conditions:

- (i) D will visit Los Angeles, only if B is part of the group.
- (ii) If the group has to visit either Istanbul or Kathmandu, then G has to be a part of the group.
- (iii) The group can visit Addis Ababa only if both A and D are part of the group.
- (iv) The group cannot visit Udaipur unless C is part of the group.
- (v) If F is part of the group, then neither E nor G can be part of the group.
- (vi) If the group has to visit Berlin, then both B and F must be part of the group.

- (vii) If A is part of the group, then G cannot visit Kathmandu.  
 (viii) If B is part of the group, then C cannot visit Paris.

**Note:** In the questions that follow, assume that Kiran is not counted as part of the group that he forms.

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

5. If the group visits the maximum possible number of cities, what is the maximum number of persons that can be in the group?  
 (A) 3 (B) 2 (C) 4 (D) 5
6. If there are exactly five persons in the group, what is the maximum possible number of cities that the group can visit?  
 (A) 3  
 (B) 4  
 (C) 5  
 (D) None of the above
7. If there are exactly five persons in the group, and it is known that the group can visit a maximum of three cities, which of the following cities can the group definitely visit?  
 (A) Istanbul (B) Addis Ababa  
 (C) Berlin (D) Los Angeles
8. If there are exactly five persons in the group and the group can visit Paris, which of the following cities will the group definitely not visit?  
 (A) Kathmandu  
 (B) Berlin  
 (C) Udaipur  
 (D) More than one of the above

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

Three students, Ritesh, Kalyan and Charan, attempted a college entrance exam called Certainly Arduous Test (CAT) in each of the years 2017 and 2018. In the exam, there were exactly three sections – Questionable Ability (QA), Decidedly Impossible to Learn Reasoning (DILR) and Very Appalling and Ridiculous Comprehension (VARC). In each section, the score of any student is a positive multiple of five from 5 to 90 (both inclusive).

For any student, his score in each section in 2018 increased as compared to his score in that section in 2017. Further, if a student scored a certain mark in any section in any year, he did not score the same mark again in any section in any year and none of the other two students scored the same mark in any section in any year.

It is also known that

- (i) Ritesh scored 85 marks in DILR in 2017, while Kalyan scored 15 marks and 5 marks in DILR in the two years, in any order.
- (ii) in 2017, Charan's score in QA was 15 more than that of Kalyan in VARC and, in 2018, Charan's score in QA was 20 more than that of Kalyan in VARC.
- (iii) one of the students scored less than 40 in VARC in 2018, while Charan scored a total of 95 marks in VARC across the two years.

- (iv) the score of Ritesh in QA in 2018 is 15 more than the score of Charan in DILR in 2017 and neither of these scores was less than 65.
- (v) Kalyan's score in VARC in 2018 was 20 more than that in 2017, while Kalyan scored 10 marks in QA in one of the years.
- (vi) the score of Charan in DILR in 2018 was 30 more than the score of Kalyan in VARC in 2018 and the score of Kalyan in QA in 2018 was more than the score of Ritesh in QA in 2017.

**DIRECTIONS for questions 9 and 10:** Type in your answer in the input box provided below the question.

9. What is the score of Kalyan in QA in 2018?

10. What is the highest mark scored by any student in QA in any year?

**DIRECTIONS for questions 11 and 12:** Select the correct alternative from the given choices.

11. For how many students was the increase in the total marks scored in the test between the two years more than 50?  
 (A) 0 (B) 1 (C) 2 (D) 3
12. What is the difference between the highest mark and the lowest mark scored by any student in VARC in 2018?  
 (A) 10 (B) 15  
 (C) 25 (D) None of the above

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

There are  $n$  persons in a colony, each of whom purchases groceries from one or more among three stores – Cooked Goose, Couch Potato, and Basket Case.

The number of persons who purchase groceries from Cooked Goose, Couch Potato and Basket Case are 222, 248 and 231, not necessarily in the same order.

It is also known that

- (i) the number of persons who purchase from all the three stores is half the number of persons who purchase from exactly two stores.
- (ii) the number of persons who purchase groceries only from Cooked Goose is half the number of persons who purchase groceries from Basket Case.
- (iii) the number of persons who purchase groceries from Couch Potato is thrice the number of persons who purchase from exactly two stores.
- (iv) the number of persons who purchase only from Couch Potato is eight more than the number of persons who purchase only from Basket Case.

**DIRECTIONS for questions 13 and 14:** Type in your answer in the input box provided below the question.

13. What is the value of  $n$ ?

14. What is the number of persons who purchase groceries from Cooked Goose and Basket Case but not from Couch Potato?

**DIRECTIONS** for questions 15 and 16: Select the correct alternative from the given choices.

15. What is the difference between the number of persons who purchase groceries only from Basket Case and the number of persons who purchase groceries only from Cooked Goose?  
 (A) 31  
 (B) 32  
 (C) 33  
 (D) None of the above
16. Among the persons who purchase groceries from Cooked Goose, what is the number of persons who purchase from at least two stores?  
 (A) 100 (B) 98 (C) 107 (D) 112

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

Four friends, John, Avon, Travis and Kevin, use a social networking site called MyFace. Each person has a certain number of friends and no two of the four persons are friends of each other. Further, any other person who uses MyFace is a friend of at most two of these four persons.

The table below provides partial information about the number of friends of the four persons. In the table, the values along the diagonal provides the total number of friends that each person has and the values in the other cells indicate the number of persons who are friends with both the person represented by the row and the person represented by the column.

|        | John | Avon | Travis | Kevin |
|--------|------|------|--------|-------|
| John   | 150  | 20   |        | 30    |
| Avon   |      | 180  |        |       |
| Travis | 40   |      | 110    |       |
| Kevin  |      |      |        | 160   |

**DIRECTIONS** for questions 17 and 18: Type in your answer in the input box provided below the question.

17. How many persons are friends of only John?

18. What is the maximum possible number of persons who are friends of both Avon and Kevin?

**DIRECTIONS** for questions 19 and 20: Select the correct alternative from the given choices.

19. What is the minimum possible number of persons who are friends of both Kevin and Travis?  
 (A) 0 (B) 10 (C) 20 (D) 30

20. If the number of persons who are friends with both Avon and Travis is the same as the number of persons who are friends of only John, what is the maximum possible number of persons who are friends of only Travis?  
 (A) 70 (B) 50 (C) 30 (D) 10

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

Six postmen – A through F – traveled in a minivan that went from Angloor to Kangloor. Between Angloor and Kangloor, there were six stops – Changloor, Dangloor, Fangloor, Gangloor, Hangloor, Jangloor – not necessarily in the same order, where each postman delivered a parcel that he carried with him. It is known that no two postmen delivered their parcels at the same stop. The minivan had six seats, in the form of a  $3 \times 2$  grid, with three seats in each column and two seats in each row, for the postmen to sit. The driver of the minivan sits in a separate seat at the front.

When the van started at Angloor, the postman who had to deliver the parcel at the first stop sat in the seat in the first row and first column. Immediately after any postman delivered his parcel, he exchanged his seat with the postman who must deliver his parcel at the immediate next stop. After the last postman delivered his parcel, he did not exchange his seat with anyone.

The following information is known:

- Before any of the postmen delivered their parcels, F was sitting immediately behind C, while D and B were sitting in the same row.
- C and E changed their seats only once and E delivered his parcel before C did. E delivered his parcel at Changloor.
- B and A exchanged their seats immediately after a parcel was delivered at Hangloor and F exchanged his seat with both A and D. D delivered his parcel at Fangloor.
- The van stopped at Fangloor before it stopped at Jangloor and after it stopped at Gangloor, which, in turn, is two stops away from Hangloor.

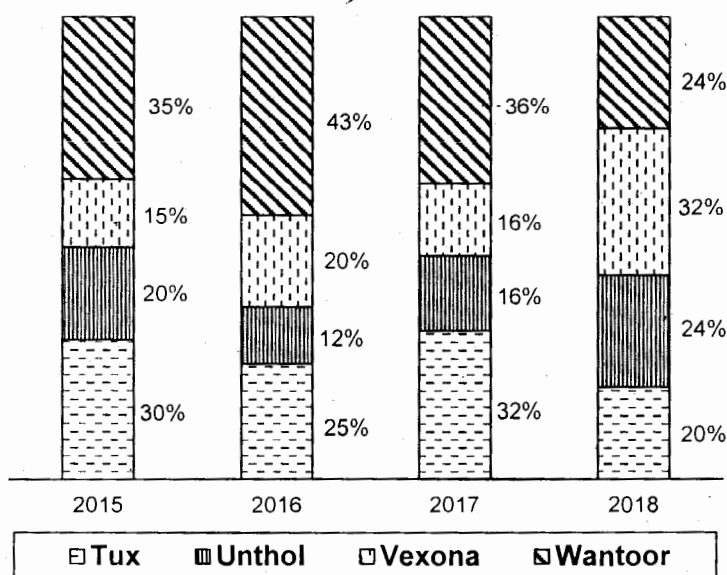
**DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

21. After the last parcel was delivered, who was sitting immediately behind D?  
 (A) B  
 (B) C  
 (C) A  
 (D) No one, since D was sitting in the last row.
22. If B was sitting immediately ahead of F during a part of the trip, who among the following was sitting immediately behind A, when the van left Gangloor?  
 (A) E  
 (B) F  
 (C) D  
 (D) No one, since A was sitting in the last row.
23. At which stop did A deliver his parcel?  
 (A) Hangloor (B) Dangloor  
 (C) Gangloor (D) Jangloor
24. Who was the fourth person to deliver his parcel?  
 (A) B (B) C (C) D (D) F

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

The stacked bar graph given below provides the percentage breakup of the number of units of soap sold in a city over four years, 2015 through 2018. During the given period, only four brands of soaps – Tux, Unthol, Vexona and Wantoor – were sold in the city.

It is known that, for each brand of soap, the number of units sold in any year was inversely proportional to the price per unit of the brand of soap in that year. The price per unit of any brand of soap remains constant throughout any year and only changes at the beginning of each year.



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

25. If the price of Tux in 2017 was 80% more than its price in 2016, what is the ratio of the number of units of Unthol sold in 2016 to the number of units of Wantoor sold in 2017?

(A) 0.768  
(B) 0.678  
(C) 0.876  
(D) Cannot be determined

26. If the price of exactly one of the brands of soaps remained constant throughout the given period, the total number of soaps sold in 2017 as a percentage of that sold in 2018 is at least

(A) 62.5%. (B) 50%.  
(C) 56.25%. (D) 66.67%.

27. It is known that the price of one of the four brands of soaps, say X, across the four years was ₹16, ₹20, ₹40 and ₹15, respectively. The price of another brand of soap, say Y, across the four years was ₹8, ₹16, ₹20 and ₹24, respectively.

Which of the following brands of soap is Y?

(A) Tux (B) Vexona  
(C) Unthol (D) Wantoor

28. It is known that the price of one of the four brands of soaps, say X, across the four years was ₹16, ₹20, ₹40 and ₹15, respectively. The price of another brand of soap, say Y, across the four years was ₹8, ₹16, ₹20 and ₹24 respectively.

What is the highest percentage increase in the number of units sold for any brand in any year as compared to the previous year?

(A) 125% (B)  $166\frac{2}{3}\%$   
(C)  $133\frac{1}{3}\%$  (D) None of the above

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

Six countries, P through U, are ranked from 1 to 6 on each of two parameters – Ease of Starting Business (ESB) and Probability of Bankruptcy (PB). No two countries have the same rank in any parameter and no country has the same rank across the two parameters. In any parameter, a numerically lower rank is considered to be better than a numerically higher rank.

Further, the sum of the two ranks of any country was not greater than 8.

It is also known that

- P is ranked better than U in PB, while U's rank in ESB is worse than its rank in PB.
- S, which is ranked fourth in PB, is not ranked second in ESB.
- the country which is ranked sixth in ESB is not ranked first in PB.
- the rank of R in ESB is the same as the rank of T in PB, while the rank of T in ESB is the same as the rank of R in PB.
- U is ranked third in PB, and R is ranked fifth in ESB.

**DIRECTIONS** for questions 29 to 32: Select the correct alternative from the given choices.

29. What is the rank of Q in ESB?  
 (A) 1 (B) 2 (C) 3 (D) 4
30. Which country is ranked third in ESB?  
 (A) P (B) Q (C) S (D) T

31. For how many countries is the sum of their ranks in ESB and PB exactly eight?  
 (A) 0 (B) 1  
 (C) 2 (D) More than 2
32. How many countries are ranked worse than S in ESB but better than S in PB?  
 (A) 0 (B) 1  
 (C) 2 (D) More than 2

### SECTION – III

Number of Questions = 34

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

1. A and B are two points with coordinates (0, 0) and (16, 64) respectively.  $M_1$  is the midpoint of the line joining A and B,  $M_2$  the midpoint of that joining  $M_1$  and A,  $M_3$  the midpoint of that joining  $M_2$  and A and so on. If the coordinates of  $M_{10}$  are (h, k), then find the value of  $\left(\frac{1}{h} + \frac{1}{k}\right)$ .
2. In an examination, a candidate wrote five papers all having equal maximum possible marks. If the marks he secured in these five papers are in the ratio 4 : 5 : 6 : 7 : 8, and the average of his highest and lowest scores is 48%, find the number of papers in which he scored not less than 60%.

**DIRECTIONS** for questions 3 to 6: Select the correct alternative from the given choices.

3. Two vessels, A and B, contain equal quantities of a solution of milk and water. The concentration of milk is the same in both A and B. If eight litres of the solution from A is replaced with pure milk, then the concentration of milk in A becomes twice of what it was initially. If 16 litres of the solution from B is replaced with pure milk, then find the ratio of the final concentration of milk in B to the initial concentration of milk in B.  
 (A) 2.5 (B) 3 (C) 3.5 (D) 4
4. Anoop multiplied two two-digit natural numbers, with at least one of them having distinct digits. He then reversed the digits of each number and found the product of the resultant numbers. Interestingly, he found both products to be the same. If the product of the tens digits of the two numbers is prime, find the sum of all the possible products that Anoop could have obtained.  
 (A) 2604 (B) 2712 (C) 2697 (D) 2627
5. If  $x = 1 + a^2$ ,  $y = 1 + b^2$ ,  $z = 1 + c^2$ , and  $a + b + c = 0$ , then  $ab + bc + ca =$   
 (A)  $3 - (x + y + z)$  (B)  $1 - \frac{(x + y + z)}{2}$   
 (C)  $1 + \frac{(x + y + z)}{2}$  (D)  $\frac{3 - (x + y + z)}{2}$
6. If  $\log_2(x^y + y^4 - 41) = 8$ , where x and y are positive integers, then the value  $xy^3$  can be

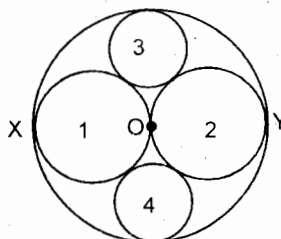
- (A) 216. (B) 162.  
 (C) 192. (D) None of the above

**DIRECTIONS** for question 7: Type in your answer in the input box provided below the question.

7. The quartile deviation for the set of numbers 7, 13, 5, 1, 33, 35 and 31 is

**DIRECTIONS** for questions 8 to 12: Select the correct alternative from the given choices.

8. Four circular lawns have to be made inside a circular ground with diameter XY, as shown in the figure below.



- 'O' is the centre of the ground and OX and OY are the diameters of lawns 1 and 2 respectively. Each of the lawns 3 and 4 touches both the lawns 1 and 2 and the circumference of the circular ground. What percentage (approximately) of the total area of the ground is occupied by the four lawns?  
 (A) 68 (B) 70 (C) 72 (D) 75
9. Mathews sold a television set at a profit of 10%. Had he sold it for ₹1200 more, he would have made a profit of 25%. Which of the following is the cost price of the television set?  
 (A) ₹6000 (B) ₹7500 (C) ₹8000 (D) ₹9000
10. If x and y are positive numbers and  $\sqrt{x^2 + 16y} + \sqrt{y^2 + 16x} = 45$  and  $x - y = 9$ , then find the value of  $x + y$ .  
 (A) 15 (B) 21 (C) 31 (D) 36
11. Two business partners, A and B, invested their capitals in the ratio of 2 : 3 respectively, with their periods of investment not being equal. If they shared the year-end profit in the ratio of 1 : 2 respectively, what is the ratio of their respective periods of investment?  
 (A) 3 : 4 (B) 4 : 3 (C) 2 : 1 (D) 1 : 4

12. If  $f(x) = \frac{16^{2x}}{16^{2x} + 16}$ , then the value of

$$f\left(\frac{1}{2}\right) + f\left(\frac{1}{4}\right) + f\left(\frac{1}{8}\right) + f\left(\frac{1}{16}\right) + f\left(\frac{3}{4}\right) + f\left(\frac{7}{8}\right) + f\left(\frac{15}{16}\right) =$$

- (A) 4 (B)  $\frac{7}{2}$  (C)  $\frac{5}{2}$  (D) 3

**DIRECTIONS** for questions 13 and 14: Type in your answer in the input box provided below the question.

13. Three men and four women working together can do a piece of work in four days, whereas four men and two women working together require six days to complete the same work. In how many days can nine men and two women working together finish the work?

14. A natural number  $n$  is such that  $100 \leq n \leq 240$ . If HCF of  $n$  and 240 is 1, how many values of  $n$  are possible?

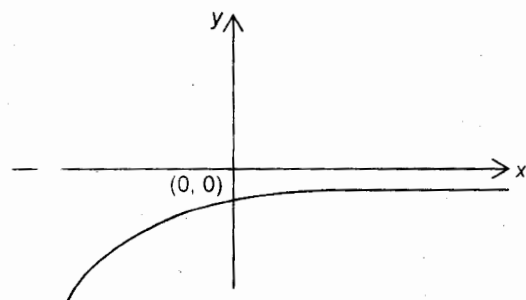
**DIRECTIONS** for question 15: The question below is followed by two statements, I and II. Study whether the information given in the statements is sufficient to answer the question and select the correct alternative from the given choices.

15. Is 26<sup>th</sup> January of year X a Sunday?

- I. 26<sup>th</sup> January of the year preceding year X was a Friday.  
 II. 26<sup>th</sup> January of the year following year X is not a Monday.  
 (A) The question can be answered by using one of the statements alone but not the other statement alone.  
 (B) The question can be answered by using either of the statements alone.  
 (C) The question can be answered by using both statements together but not by either statement alone.  
 (D) The question cannot be answered even by using both the statements together.

**DIRECTIONS** for questions 16 to 20: Select the correct alternative from the given choices.

- 16.



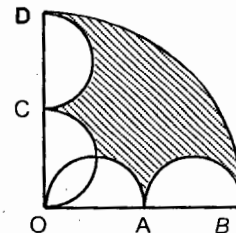
Which of the following can best describe the above graph?

- (A)  $y = |e^{-x}|$   
 (B)  $y = -|\log(-x)|$   
 (C)  $y = -e^{-x}$   
 (D)  $y = -\log(-x)$

17. If  $x$ ,  $y$  and  $z$  are single-digit whole numbers, for how many ordered triplets  $(x, y, z)$  is the number  $x246y8189z$  divisible by 8, 9 and 11?

- (A) 8  
 (B) 9  
 (C) 6  
 (D) None of the above

18. In the figure below, find the area (in sq. units) of the shaded portion, i.e., the portion of the quadrant DOB which is not included in the four semicircles with diameters as OA, AB, OC and CD, given that  $OA = AB = OC = CD = 2$  units and  $\angle DOB = 90^\circ$ .



- (A)  $\frac{5\pi}{2} - \frac{1}{2}$  (B)  $5\pi - 1$   
 (C)  $\frac{5\pi}{2} + \frac{1}{2}$  (D)  $\frac{5\pi}{2} - 1$

19. Find the value of  $\sqrt{11 - \sqrt{72}} + \sqrt{11 + \sqrt{72}}$ .

- (A)  $2\sqrt{3}$  (B)  $4\sqrt{3}$   
 (C) 6 (D)  $4\sqrt{2}$

20. Amy, Bob and Chip are three bees that start from the same flower and fly away in three different directions in search of nectar. After some time Chip is as far from the midpoint, D, of the straight line joining Amy and Bob as Amy is from D. Amy and Bob are 300 m apart, while Bob is 180 m from Chip. At this instant, Amy sends a distress signal which is received simultaneously by the other two bees. If a bee can fly at a speed of 3 m/sec, then which among Bob and Chip can reach Amy quicker and by how many seconds?

- (A) Chip – by 20 seconds  
 (B) Bob – by 20 seconds  
 (C) Bob – by 18 seconds  
 (D) Chip – by 18 seconds

**DIRECTIONS** for question 21: Type in your answer in the input box provided below the question.

21. Amina prepared a fruit salad by taking some blueberries, some strawberries, some cherries and some grapes. If she used double the number of blueberries as strawberries and triple the number of grapes as cherries, find the number of strawberries used by her, given that she used a total of 20 fruits.

**DIRECTIONS** for question 22: The question below is followed by two statements, I and II. Study whether the information given in the statements is sufficient to answer the question and select the correct alternative from the given choices.

22. If  $a$  and  $b$  are integers, is  $5a - 6b$  a multiple of 7?

- I.  $3a + 5b$  is a multiple of 7.  
 II.  $5a + 3b$  is a multiple of 7.  
 (A) The question can be answered by using one of the statements alone but not the other statement alone.  
 (B) The question can be answered by using either of the statements alone.  
 (C) The question can be answered by using both statements together but not by either statement alone.  
 (D) The question cannot be answered even by using both the statements together.

**DIRECTIONS** for question 23: Select the correct alternative from the given choices.

23. If  $(6 - \sqrt{197})x^2 - 48x + 90 - 25\sqrt{197} = 2\sqrt{197}x^2 - 24\sqrt{197}x + 20\sqrt{197}$ , and  $\alpha$  and  $\beta$  are the roots of the equation, then which of the following is true of  $\alpha$  and  $\beta$ ?  
 (A) They are real, irrational and distinct but conjugates of each other.  
 (B) They are real, irrational and equal.  
 (C) They are real, rational and equal.  
 (D) They are real, rational and distinct.

**DIRECTIONS** for questions 24 and 25: Answer the questions on the basis of the information given below.

The probability of a bomb hitting a bridge when it is dropped from a plane is 0.5. At least two hits are required to destroy the bridge completely.

**DIRECTIONS** for questions 24 and 25: Select the correct alternative from the given choices.

24. Find the least number of bombs that must be dropped so that the probability of destroying of the bridge completely is greater than 0.99.  
 (A) 10 (B) 11  
 (C) 9 (D) 8
25. What is the probability that at least seven and at most nine bombs were needed to destroy the bridge completely?  
 (A) 0.11 (B) 0.09  
 (C) 0.08 (D) 0.1

**DIRECTIONS** for questions 26 to 29: Type in your answer in the input box provided below the question.

26. If the perimeter of a rectangle with length three times its breadth is 24 cm, find the area (in sq. cm) of the rectangle.

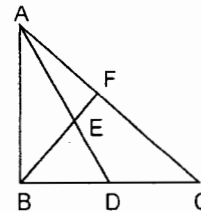
27. The sides of a regular decagon are extended to form a star. Find the measure of the internal angle (in  $^\circ$ ) at each point of the star.

28. A cubic polynomial  $P(x)$  has a leading coefficient of 1. When divided by  $x$ ,  $P(x)$  leaves a remainder of 1 and when divided by  $x - 3$  or  $x + 3$ , it leaves a remainder of 10. Find the remainder when  $P(x)$  is divided by  $x - 4$ .

29. Kamlesh was standing on the bank of a river and observed that the angle of elevation of the top of a tower on the opposite bank was  $60^\circ$ . He further observed that if he moved away from the bank of the river by 180 m, the angle of elevation of the top of the tower changed to  $30^\circ$ . Find the width of the river (in m).

**DIRECTIONS** for questions 30 to 32: Select the correct alternative from the given choices.

30. If  $10^{48} = x$ ,  $10^{60} = y$  and  $x^z = y^4$ , then the value of  $z$  is  
 (A) 4. (B) 5. (C) 6. (D) 10.
31. In the figure below,  $BD = 8$  cm and  $DC = 6$  cm. If  $AE : ED = 3 : 4$ , and  $AF = 12$  cm, find  $AC$  (in cm).



- (A) 28 (B) 38 (C) 44 (D) 40
32. If a sum lent at simple interest amounts to ₹3240 in 4 years and to ₹3780 in 6 years, in how many years will the sum become twice of itself?  
 (A) 4 (B) 6 (C) 12 (D) 8

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

33. In how many ways can four friends, Bheem, Chutki, Raju and Jaggu, share 50 laddoos among themselves, such that each of them gets an odd number of laddoos?

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

34. Find the range of  $x$  such that  $x^3 - 1$  is less than  $x^2 - x$ .  
 (A)  $(-\infty, 1)$  (B)  $(-3, 2)$   
 (C)  $(0, \infty)$  (D)  $(1, \infty)$



