

Ref: AIMCAT1724

**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 3: The passage given below is followed by a set of three questions. Choose the best answer to each question.

One hundred years ago, in 1896, a doctor in England, published the first description of developmental dyslexia. "Percy F., . . . aged 14, . . . has always been an intelligent boy," wrote W. Pringle Morgan in the British Medical Journal, "quick at games, and in no way inferior to others of his age. His great difficulty has been his inability to learn to read." In 1996 as in 1896, reading ability is taken as a proxy for intelligence; most people assume that if someone is smart and schooled, he will learn to read. But the experience of dyslexics like Percy F. has shown that assumption to be false.

Dyslexia is an unexpected difficulty in learning to read despite intelligence, motivation and education. Early explanations held that defects in visual system were responsible for reversal of letters/ words thought to typify dyslexic reading. Eye training was often prescribed to overcome these alleged visual defects. But dyslexics are not unusually prone to reversing letters/ words. The cognitive deficit is related to the language system. It reflects a deficiency in the processing of phonemes, the distinctive linguistic units of spoken and written words. Dyslexic children have problems in naming letters but not in copying letters. Yearly monitoring of phonological skills from first through 12th grade shows that the disability persists into adulthood.

We have a fine example of dyslexia in Gregory, a young medical student who had been diagnosed as dyslexic in grade school. His native intelligence, extensive support and tutoring, enabled him to gain admission to an Ivy League College. Gregory excelled in areas requiring reasoning skills. But he found pronouncing long words or novel terms (labels in anatomic descriptions) problematic. His least well-developed skill was rote memorization and rapid word retrieval. Gregory's dilemma with long or novel words is entirely consistent with the body of evidence that supports a new phonological model of dyslexia.

Before words can be identified, understood, stored in memory or retrieved from it, they must first be broken down, or parsed, into their phonetic units by the phonological module of the brain. In spoken language, this process occurs automatically, at a preconscious level. A genetically determined phonological module automatically assembles the phonemes into words for the speaker and parses the spoken word back into its underlying phonological components for the listener. In producing a word, the human speech apparatus automatically compresses and merges the phonemes. Information from several phonemes is folded into a single unit of sound. Because there is no overt clue to the underlying segmental nature of speech, spoken language appears to be seamless. Reading is an invention and must be learned at a conscious level. The reader transforms the visual percepts of alphabetic script (graphemes) into linguistic ones (phonemes). The reader must first come to a conscious awareness of the internal phonological structure of spoken words. Then he must realize that the sequence of letters on the page represents this phonology. That is what happens when a child learns to read. In dyslexia, a deficit within the language system at the level of the phonological module impairs a person's ability to segment the written word into its underlying phonological components. This explanation is called phonological model or phonological deficit hypothesis.

1. Which of the following statements can be said to be true in the context of the passage?  
(A) Mirror writing is a symptom of dyslexia which can be corrected by eye training.  
(B) Dyslexia can be outgrown but smart people cannot be dyslexic.
- (C) A new model of dyslexia emphasizes defects in the visual system rather than language processing.  
(D) The phonological model proposes that, for dyslexics, reading is not as seamless a cognitive process as speaking.

2. Which of the following activities would a dyslexic find difficult to excel at?
- Spontaneous word recovery
  - A memorizing process using routine or repetition
  - Tests involving higher order reasoning
  - Competitions involving timed crossword puzzles
  - Recalling and spelling out long, complex and novel scientific names
- (A) (i), (ii), (v)                                   (B) (ii), (iii), (iv)  
 (C) (i), (ii), (iv), (v)                           (D) (i), (ii), (iii), (iv)
3. Which of the following best characterizes the difference between reading and speaking according to the phonological deficit hypothesis?
- (A) A speaker consciously assembles and merges several phonemes into a single unit of sound and makes this available to the listener, while a reader subconsciously transforms graphemes into their phonological forms in order to understand them.
- (B) Reading involves consciously segmenting words into their underlying phonological elements, while speaking is carried out at a subconscious level by a biologically determined phonological module in the brain.
- (C) Though both reading and speaking are carried out at a subconscious level, the impact of phonological deficit is more obvious in speaking than in reading.
- (D) Reading involves identifying and interpreting phonemes, while speaking involves only identifying graphemes.

**DIRECTIONS** for questions 4 to 9: The passage given below is followed by a set of six questions. Choose the best answer to each question.

**O**ver the last few years we've been treated to a number of "Facebook revolutions," from the Arab Spring to Occupy Wall Street to the squares of Istanbul, Kiev and Hong Kong, all fuelled by social media. But once the smoke cleared, most of these revolutions failed to build any sustainable new political order, in part because as so many voices got amplified, consensus-building became impossible.

Question: Does it turn out that social media is better at breaking things than at making things?

Last month an important voice answered this question with a big "yes." That voice was Wael Ghonim, the Egyptian Google employee whose anonymous Facebook page helped to launch the Tahrir Square revolution in early 2011 that toppled President Hosni Mubarak – but then failed to give birth to a true democratic alternative.

In December, Ghonim, who has since moved to Silicon Valley, posted a TED talk which begins like this: "I once said, 'If you want to liberate a society, all you need is the Internet.' I was wrong. I said those words back in 2011, when a Facebook page I anonymously created helped spark the Egyptian revolution. The Arab Spring revealed social media's greatest potential, but it also exposed its greatest shortcomings. The same tool that united us to topple dictators eventually tore us apart."

In June 2010, he noted, the "Internet changed my life forever. While browsing the internet, I saw a photo ... of a tortured, dead body of a young Egyptian guy. His name was Khaled Said. Khaled was a 29-year-old Alexandrian who was killed by police. I saw myself in his picture. ... I anonymously created a Facebook page and called it 'We Are All Khaled Said.' In just three days, the page had over 100,000 people, fellow Egyptians who shared the same concern."

Soon Ghonim and his friends used Facebook to crowd-source ideas, and "the page became the most followed page in the Arab world. ... Social media was crucial for this campaign. It helped a decentralized movement arise. It made people realize that they were not alone. And it made it impossible for the regime to stop it."

Ghonim was eventually tracked down in Cairo by Egyptian security services, beaten and then held incommunicado for 11 days. But three days after he was freed, the millions of protesters his Facebook posts helped to galvanize brought down Mubarak's regime.

Alas, the euphoria soon faded, said Ghonim, because "we failed to build consensus, and the political struggle led to intense polarization." Social media, he noted, "only amplified" the polarization "by facilitating the spread of misinformation, rumours, echo chambers and hate speech. The environment was purely toxic."

Here is what he concluded about social media today: "First, we don't know how to deal with rumours. Rumours that confirm people's biases are now believed and spread among millions of people." Second, "We tend to only communicate with people that we agree with, and thanks to social media, we can mute, un-follow and block everybody else. Third, online discussions quickly descend into angry mobs. ... It's as if we forget that the people behind screens are actually real people and not just avatars."

"And fourth, it became really hard to change our opinions. Because of the speed and brevity of social media, we are forced to jump to conclusions and write sharp opinions in 140 characters about complex world affairs. And once we do that, it lives forever on the Internet."

Fifth, and most crucial, he said, "today, our social media experiences are designed in a way that favours broadcasting over engagements, posts over discussions, shallow comments over deep conversations. ... It's as if we agreed that we are here to talk at each other instead of talking with each other."

4. According to the passage, which of the following is a reason for social media being ineffective in building sustainable political order?
- Social media creates polarized groups that lose the ability to become constructive.
  - Social media intensifies the voices of individuals making it impossible to come to an agreement.
  - Social media rapidly spreads misinformation and rumours which distorts the public opinion.
  - Social media allows for a decentralized movement to arise which usually lacks any strong leadership.
5. What does Wael Ghonim imply when he says, "we are here to talk at each other instead of talking with each other"?
- Social media experiences allows one-way communication only and does not incorporate any feedback mechanism.
  - The people who use social media are mostly dogmatic and do not value the opinion of others.
  - Social media is designed in such a way that it is impossible to hold deep and meaningful conversations using it.
  - When using social media, it is easier to simply transmit one's message than it is to participate in a two-way conversation.
6. Social media played an important part in toppling the dictatorship of Hosni Mubarak in Egypt by
- making Khaled Said known to Wael Ghonim.
  - providing a platform for millions of protestors to spread rumours about the dictatorial regime.
  - providing a voice to the individuals with similar goals and uniting these individuals.
  - galvanizing the people following the arrest of Wael Ghonim to bring down Mubarak's regime.
7. The role of Wael Ghonim in Tahrir Square revolution is closest to the role of
- a rebel who preached and united people for a cause and led the fight from the front.
  - an anonymous revolutionary who unified people having the same interests.
  - an idealist who publicized police brutality but remained in the side-lines without getting involved.
  - an anonymous visionary who toppled a regime and established another political order in its place.
8. According to the passage, which of the following is not a feature of social media?
- People are more prone to believe in rumours because of social media.
  - Social media tends to create avatars out of real people because of which angry mobs are formed.
  - Through social media, people can form a bubble which filters out any dissenting voices.
  - Social media compels people to form imprudent opinions which cannot be modified easily.
9. What is the reason for Ghonim to admit that he was wrong in saying "If you want to liberate a society, all you need is the Internet"?
- Social media spread misinformation and formed angry mobs, which were impossible to control.
  - Social media created silos out of dissenting groups ruling out any chance of compromise or consensus building.
  - Social media could not protect the anonymity of Ghonim leading to his capture which dampened the revolution.
  - Social media made it difficult to change opinions which was crucial for building a new political order.

**DIRECTIONS** for questions 10 to 12: The passage given below is followed by a set of three questions. Choose the best answer to each question.

The discovery of what looks like the aftermath of a brutal clash between two groups of prehistoric hunter-gatherers on the shore of an African lake is certain to stir up a debate about human nature that goes all the way back to Adam and Eve.

The biblical creation story posits that our forebears were inherently pure and peaceful and only fell into nasty struggles for dominance with the knowledge of the forbidden fruit. A corollary advanced by one school of archaeologists and anthropologists holds that our Stone Age ancestors were not inherently violent, and, apart from the odd murder, did not wage organized war until they started to coalesce into societies.

Not so, proclaim proponents of a rival theory that war has deep biological roots, and we've been waging it forever. That's what we are, argued the philosopher Thomas Hobbes; not so, declared Jean-Jacques Rousseau. Even President Obama jumped into the debate when, in his Nobel acceptance speech in 2009, he asserted that "War, in one form or another, appeared with the first man."

What scientists found at a place called Nataruk on what was once the shore of a lagoon on Lake Turkana in Kenya were skeletons showing unmistakable evidence of violent deaths — crushed skulls, imbedded arrow or spear points and the like. According to a report of the find in the journal Nature, one man had been hit in the front of the head and stabbed in the neck; the skeleton of a pregnant woman looked like she had been tied up before she was killed. It was obviously a terribly violent encounter. But was it war?

The skeletons, alas, do not provide a conclusive answer, the scientists acknowledged. War, broadly defined as large-scale violent clashes, was fairly common between settled societies, and it is not clear whether the dwellers on the fertile land around Lake Turkana at the time of the Nataruk clash were already forming such societies, which would make a

violent encounter less surprising, or whether the foraging groups banded together to fight. "In either case," write the scientists, "the deaths at Nataruk are testimony to the antiquity of inter-group violence and war."

But are they testimony to the inevitability of war? If warfare is indeed common from the dawn of human history, does that suggest that we will never cease fighting? Not necessarily. A propensity for violence, even if it is innate, has been more than matched throughout our existence by a preference for peace — a fact the bones of the victims of the battle of Nataruk cannot show.

10. What significance do the skeletons discovered at Nataruk have on the debate mentioned in the passage?
  - (A) The skeletons prove that our ancestors were not inherently violent and waged war only after societies were formed.
  - (B) The skeletons prove that war existed even before there were any societies.
  - (C) The skeletons indicate that even though wars appeared with the first man, humans tend to prefer peace over violence.
  - (D) The skeletons indicate the primeval nature of violent encounters and wars.
11. According to the passage, what can be inferred to be the difference between violent encounters from wars?
  - (A) Wars occurs between large, organized groups of people and violent encounters are perpetrated on a smaller scale.
  - (B) War always occurs between societies whereas violent encounters can occur between any two groups.
12. Which of the following statements, if true, would most support the views held by Thomas Hobbes regarding the antiquity of war?
  - (A) The dwellers at Lake Turkana were part of well-formed societies at the time of the Nataruk clash.
  - (B) The dwellers at Lake Turkana were more violent compared to other dwellers present in that region.
  - (C) The dwellers at Lake Turkana were foraging groups who did not yet form into societies.
  - (D) The dwellers at Lake Turkana were nomads and stayed for a very little time at Lake Turkana.

**DIRECTIONS** for questions 13 to 18: The passage given below is followed by a set of six questions. Choose the best answer to each question.

If the Queen's governess were still alive today, she may have noticed a few discordant notes in her charge's formerly crystal clear diction. OK, she ain' exactly droppin' her Ts and her Gs like Russell Brand, but linguists have nevertheless found that her enunciation today might have been considered a little, well, common in her youth.

Her Majesty is by no means alone in this. The cut-glass accent associated with the upper class, emphasized in period dramas like Downton Abbey and Upstairs, Downstairs, has become a little rough around the edges over the last few decades, as more and more people adopt a kind of aristo-cockney hybrid.

The idea of a "proper" accent only emerged fairly recently in the history of the English language. As Jonnie Robinson, a sociolinguist at the British Library, points out, Samuel Johnson chose not to suggest the pronunciation of words in his Dictionary of the English Language, as he felt there was little agreement about the correct way to articulate his terms. "If you go back to the 18<sup>th</sup> Century, even the gentry, the educated and wealthy would have spoken with something like a local voice," Robinson says. Doctor Johnson himself was famous for having a Lichfield accent.

It was the increasing popularity of boarding schools that began to change the way the elite spoke, Robinson says, as they began to promote an accent that more closely resembled the sounds of the South East of England (where many of the schools and universities were based). Soon, the accent itself became a marker of class and power that only became exacerbated when the BBC adopted this so-called "Received Pronunciation" for its first broadcasts. "It was a voice that everyone in the UK and across the world associated with authority," says Robinson.

By the middle of the 20th Century, the class system itself had become a little more fluid; now, accent was one of the few ways to mark out those who had inherited their wealth from those who had earned it. As the novelist, essayist (and aristocrat) Nancy Mitford ironically expressed in the book Noblesse Oblige: "It is solely by their language that the upper classes nowadays are distinguished – since they are neither cleaner, richer, nor better-educated than anybody else."

Perhaps it was only a matter of time before that linguistic divide would begin to close too. As more and more people of working class background have begun to occupy positions of power – some characteristics of more regional southern English accents have started to creep into the crystal tones of Received Pronunciation (RP). "There are now those who speak a more modern form that verges on 'estuary' English, which is a mixture of RP and cockney," says Jonathan Harrington at the Ludwig Maximilian University of Munich.

In the past, for instance, RP speakers may have said "poor" and "moor" with a diphthong – a combination of two vowel sounds – so that it sounds something like "poo-uh"; today, they are more likely to pronounce the words so that they sound

identical to "paw" and "maw". Similarly, the As in "the cat sat on the mat" were once produced with a smaller mouth opening on the vowel, so it was pronounced something like "the ket set on the met".

Some younger speakers may even use glottal stops in place of the Ts in phrases such as "it is" or "that is", Robinson says. To Mitford's ears, these changes would have sounded like Pygmalion in reverse, as if Professor Higgins had taken the season's debutantes and turned them into cockney flower girls.

13. The primary reason for the author mentioning Robinson's reference to Samuel Johnson is to illustrate that
- (A) during the time of Samuel Johnson, some of the elite had unusual accents which do not occur now.
  - (B) words had more than one way of pronunciation and all the pronunciations were considered equally accurate during the time of Samuel Johnson.
  - (C) there were no set rules of pronunciation which made it difficult for Samuel Johnson to suggest pronunciation of words in his Dictionary.
  - (D) accents evolved only after the 18<sup>th</sup> century when Samuel Johnson published his Dictionary.
14. Which of the following, if true, would most support the claim that the boarding schools played a significant role in associating accent with the class system?
- (A) Boarding schools were mostly present in South East of England where the people spoke with an accent similar to the Received Pronunciation accent.
  - (B) Education at boarding schools was accessible mostly to the elite as only they could afford to attend these schools.
  - (C) The students of the boarding schools near South East of England were very successful and they usually become high ranking officials.
  - (D) Boarding schools in South East of England accepted students from all classes of the society and ensured diversity among its students.
15. Who among the following did not play a part in strengthening the association between accent and class?
- (A) Boarding Schools
  - (B) BBC
16. What will most likely be the difference between the upper class and the working class in the future as can be inferred from the passage?
- (A) The upper class will be richer, cleaner and well-educated than the working class.
  - (B) The working class will be richer, cleaner and well-educated than the upper class.
  - (C) The upper class will have a different accent as compared to the working class.
  - (D) There will be no difference in accent, wealth or education between the upper class and the working class.
17. Which of the following can be inferred from the passage about the change in Her Majesty's diction as compared to her diction when she was younger?
- (A) It has become a little unrefined.
  - (B) It has become more ubiquitous.
  - (C) It has remained unchanged, despite her governess thinking that it has become unrefined.
  - (D) It has become an aristo-cockney hybrid accent.
18. Which of the following can be inferred about the nature of cockney accent from the passage?
- I. Cockney accent is a rough accent usually associated with the working class.
  - II. Speakers having a cockney accent do not pronounce Ts in some words.
  - III. Cockney accent involves extensive use of diphthongs.
  - IV. Her Majesty speaks in a cockney accent dropping her Ts and her Gs.
- (A) Only II
  - (B) Only I and II
  - (C) Only I, II and III
  - (D) I, II, III and IV

**DIRECTIONS for questions 19 to 24:** The passage given below is followed by a set of six questions. Choose the best answer to each question.

**A**nimals are distinguished from plants on the basis of their mobility. While the relationship between consciousness and matter instantiated in the instinct of animals is sufficient and well adapted to their survival, humans are not adequately equipped in this respect; hence the necessity of something like intelligence, defined by the ability to make tools. Once again, from the point of view of real, concrete life that Bergson is here embracing, intelligence is essentially defined by its pragmatic orientation. From this, Bergson deduces not only the cognitive structure and the scientific history of intelligence, but also its limitations. This essentially pragmatic, hence analytic and quantitative orientation of intelligence precludes its immediate access to the essentially qualitative nature of life. Notice that the distinction between the two tendencies relies on the original distinction between the qualitative and the quantitative multiplicities.

Throughout *Creative Evolution*, Bergson's crucial point is that life must be equated with creation, as creativity alone can adequately account for both the continuity of life and the discontinuity of the products of evolution. But now the question is: if humans only possess analytic intelligence, then how are we ever to know the essence of life? Bergson's answer is that, because at the periphery of intelligence a fringe of instinct survives, we are able fundamentally to rejoin the essence of life. For, as the tendency and the multiplicity theories made clear, instinct and intelligence are not simply self-contained and mutually exclusive states. They must be called tendencies precisely because they are both rooted in, hence inseparable from, the duration that informs all life, all change, all becoming. There is, therefore, a little bit of instinct surviving within each intelligent being, making it immediately – if only partially – coincide with the original vital impulse. This partial coincidence, as we described above, is what forms the basis of intuition.

Finally, we can return to the question of intuition. Bergson shows, once again, that our habitual way of knowing, based in needs, is the only obstacle to knowledge of the absolute. Here he argues that this obstacle consists in the idea of disorder. All theories of knowledge have in one way or another attempted to explain meaning and consistency by assuming the contingency of order. The traditional question, "why is there order rather than disorder?" necessarily assumes that the human mind is able to create order mysteriously out of chaos. But, for Bergson, the real question is: "order is certainly contingent, but in relation to what"? His answer consists in showing that it is not a matter of order versus disorder, but rather of one order in relation to another. According to Bergson, it is the same reasoning that underlies the ideas of chance (as opposed to necessity), and of nothingness (as opposed to existence). In a word, the real is essentially positive. The real obeys a certain kind of organization, namely, that of the qualitative multiplicity. Structured around its needs and interests, our intelligence fails to recognize this ultimate reality.

However, a fringe of intuition remains, dormant most of the time yet capable of awakening when certain vital interests are at stake. The role of the philosopher is to seize those rare and discontinuous intuitions in order to support them, then dilate them and connect them to one another. In this process, philosophy realizes that intuition coincides with spirit, and eventually with life itself. Intuition and intelligence thus each correspond to tendencies within the human psyche, which, as whole, thereby coincides immediately – if only partially – with the vital impulse. It is only by leaping into intuition that the ultimate unity of mental life appears, for, just as Bergson showed against Zeno, that mobility cannot be reconstructed out of immobility. Here he explains that while one can go from intuition to intelligence by way of diminution, the analytic nature of intelligence precludes the opposite process. Thus Bergson concludes, "philosophy introduces us into spiritual life. And at the same time, it shows us the relation of the life of spirit to the life of the body".

19. How does the author develop the passage?
    - (A) The author logically makes a point on a current issue and presents arguments and counterarguments for the same.
    - (B) The author presents his view on a current issue or situation by recounting his personal experiences.
    - (C) The author explains a concept or point of view on an issue.
    - (D) The author discusses a phenomenon, explains its origin and points out its inconsistency with an existing theory.
  
  20. Which of the following choices will complete the first paragraph of the passage?
    - (A) Thanks to intuition, human beings can turn intelligence against itself so as to seize life itself.
    - (B) We turn to Bergson's account of the "complexification" of life, that is, the phenomenon of its evolution from the simple original vital impulse into different species, individuals, and organs.
    - (C) Nevertheless, at the periphery of intelligence, a fringe of instinct survives and we are able fundamentally to rejoin the essence of life.
    - (D) In any case, human intelligence will have to proceed by means of a mode of knowing that lies at the opposite end of intelligence, namely, instinct.
  
  21. According to Bergson, our habitual way of knowing prevents us from accessing the absolute since it
    - (A) leads us to prefer order to disorder.
    - (B) leads us to believe that the world is chaotic and our minds can theorize and make sense out of it.
    - (C) can be known only through becoming absolutely intuitive and one with consciousness.
    - (D) is far away from intuition.
  
  22. According to Bergson, the nature and function of intelligence in human beings is such that we cannot use it to
    - I. understand the qualitative aspect of life.
    - II. go from intelligence to intuition.
    - III. live instinctively like animals.
    - IV. create barriers between our consciousness and matter.
    - (A) I and II
    - (B) I and III
    - (C) II and IV
    - (D) I and IV
  
  23. Which of the following statements can be inferred from the passage?
    - (A) According to Bergson, the role of the philosopher is to deal with various types of intelligence.
    - (B) According to Bergson, the philosopher's role is to organize all the elements in the human psyche and to be more intuitive than intelligent.
    - (C) According to Bergson, intuition springs from the partial intersection of intelligence and instinct.
    - (D) According to Bergson, intuition emerges from the essence of consciousness.
  
  24. The style of the passage is
    - (A) abstract. (B) argumentative.
    - (C) narrative. (D) descriptive.
- DIRECTIONS for questions 25 to 28:** The five sentences (labelled 1, 2, 3, 4 and 5) given in the following question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.
25. (1) Yet the techniques soon to be available smash the traditional limits of the argument.  
 (2) Should we try to breed a better race? If so, exactly what is "better"? And who is to decide?  
 (3) We can now imagine remaking the human race not as a farmer slowly and laboriously "breeds up" his herd, but as an artist might, employing a brilliant range of unfamiliar colors, shapes and forms.  
 (4) A fierce controversy is already raging today among biologists over the problems and ethical issues arising out of eugenics.  
 (5) Such questions are not entirely new.
  
  26. (1) I doubt that anyone would seriously consider unfairness, deceit, baseness, uselessness, mediocrity or degeneration to be a solid foundation for lasting happiness and success.  
 (2) One way to simply grasp the self-evident nature of principles is to simply consider the absurdity of attempting to live an effective life based on their opposites.  
 (3) They're fundamental and are essentially unarguable because they are self-evident.

- (4) Although people may argue about how these principles are defined or manifested or achieved, there seems to be an innate consciousness and awareness that they exist.
- (5) Principles are guidelines for human conduct that are proven to have enduring, permanent value.

27. (1) On these occasions, the crucial distinction between empathy and sympathy becomes more important than ever.
- (2) Contrary to popular misconception, wise people do not reserve empathy only for friends and allies.
  - (3) In fact, we can, if we must, empathize with potential enemies, imagine ourselves in their position, and figure out how they interpret what we say and do, no matter how repugnant and irrational we may find their behaviour.
  - (4) We can empathize without sympathizing.
  - (5) While empathizing with adversaries and even enemies, can prove extremely difficult and distasteful, we must do it if we want to deal effectively with others.

28. (1) Later it was discovered that the painting was an original van Gogh as the Japanese character writing in the painting (which was treated as unimportant by the museum experts) contained mistakes identical to similar errors made by van Gogh in other works of undisputed authenticity.
- (2) A van Gogh relative later claimed his uncle never painted the work.
  - (3) When clarity and accuracy provide a correct picture, when the focus of our thoughts become misplaced, our thinking can miss the mark entirely, as illustrated by the art experts of New York's prestigious Metropolitan Museum of Art who failed to realize they had a genuine van Gogh.
  - (4) Goetz, not wanting to lose the entire investment on one person's word, commissioned four experts associated with the Metropolitan Museum of Art to examine the work but in the end, they seriously doubted the painting's authenticity for a variety of reasons.
  - (5) In the years following World War II, William Goetz purchased in Europe a self-portrait by Vincent van Gogh, *Study in Candlelight*, for about \$50000 and brought it to the United States.

**DIRECTIONS** for questions 29 to 31: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key in it.

29. (1) The purpose of the test is to find out how long you can continue to distinguish among different tones and if you have a perfect pitch, you can play this game forever and be able to distinguish among dozens of tones.

- (2) If I played you a really low tone, you would call it one, and if I played you a medium tone you would call it two, and a high tone you would call it three.

- (3) There is a concept in cognitive psychology called the channel capacity, which refers to the amount of space in our brain for certain kinds of information.
- (4) Perhaps the most interesting natural limit, however, is what we might call our social channel capacity.
- (5) Suppose, for example, that I played you a number of different musical tones, at random, and asked you to identify each one with a number.

30. (1) For those filled with regret, perhaps the most needful exercise of proactivity is to realize that past mistakes are also out there in the circle of concern.
- (2) Though he held no office or political position, through compassion, courage, fasting and moral persuasion, he eventually brought England to its knees, breaking political domination of three hundred million people with the power of his greatly expanded circle of influence.
  - (3) While his accusers were in the legislative chambers criticizing him because he wouldn't join in their Circle of Concern Rhetoric condemning the British Empire for their subjugation of the Indian people, Gandhi was out in the rice paddies, quietly, slowly, imperceptibly expanding his circle of influence with the field labourers.
  - (4) A ground swell of support, of trust, of confidence followed him through the countryside.
  - (5) Proactive people like Gandhi aren't pushy, they're smart, they're value driven, they read reality and they know what's needed.

31. (1) Planned obsolescence has been the target of so much recent social criticism that the unwary reader might be led to regard it as the primary or even exclusive cause of the trend toward shorter relational duration.
- (2) For the fear of product obsolescence drives businessmen to innovation at the same time that it impels the consumer toward rented, disposable or temporary products.
  - (3) Clearly, obsolescence occurs with or without "planning."
  - (4) It is important here to turn for a moment to the notion of obsolescence.
  - (5) The very idea of obsolescence is disturbing to people bred on the ideal of permanence, and it is particularly upsetting when thought to be planned.

**DIRECTIONS for questions 32 to 34:** Four alternative summaries are given below the text. Choose the option that best captures the essence of the text.

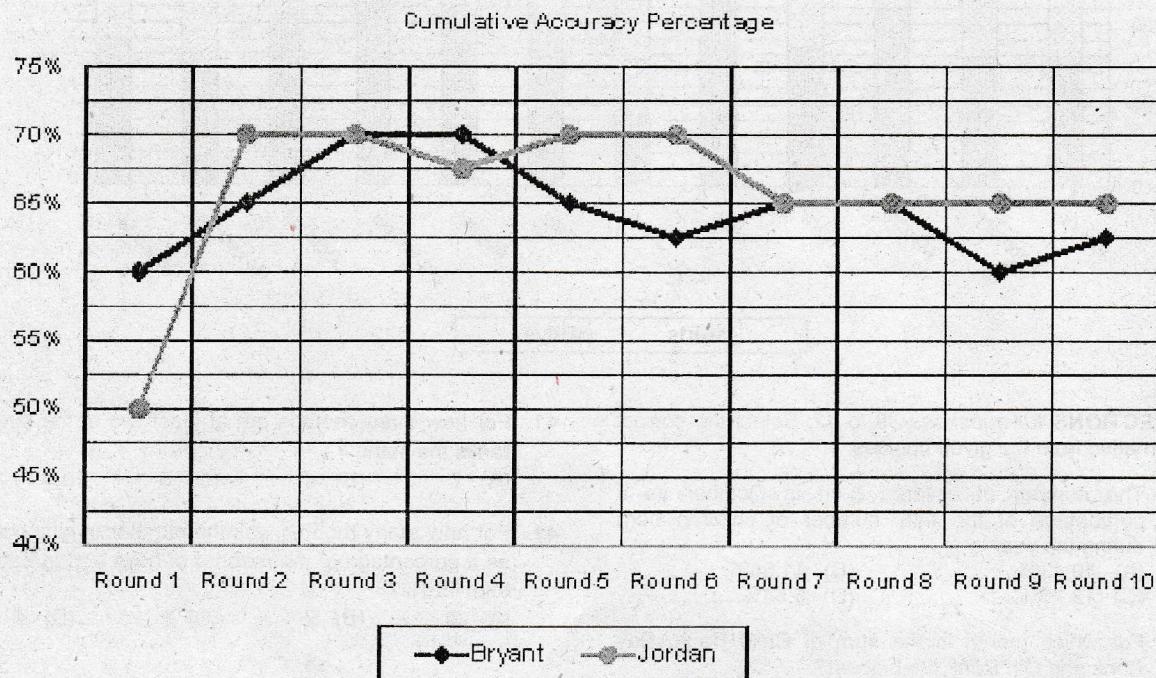
32. Free radicals are a normal by-product of metabolism. They can be defined as reactive chemical species having a single unpaired electron in an outer orbit. This unstable configuration creates energy which is released through reactions with adjacent molecules, such as proteins, lipids, carbohydrates, and nucleic acids. The majority of free radicals that break through cell membranes and damage proteins and DNA are oxygen-free radicals, and these are more generally known as "reactive oxygen species" (ROS). These are the main byproducts formed in the cells of aerobic organisms, and can initiate autocatalytic reactions so that molecules to which they react are themselves converted into free radicals to propagate the chain of damage. Free radicals induce oxidative stress, which is balanced by the body's endogenous antioxidant systems with an input from co-factors, and by the ingestion of exogenous antioxidants. If the generation of free radicals exceeds the protective effects of antioxidants, and some co-factors, this can cause oxidative damage which accumulates during the life cycle, and has been implicated in health, aging, and age dependent diseases such as cardiovascular disease, cancer and neurodegenerative disorders.
- (A) Old cells get damaged on account of free radical molecules that break through cell membranes and damage proteins and DNA. Free radicals are a normal by-product of metabolism and our bodies have built-in defenses against them. The interplay between free radicals, antioxidants, and co-factors is important in maintaining health, aging and age-related diseases.
- (B) Free radical molecules, a normal by-product of metabolism, have a single unpaired electron in the outer orbit and try to break through cell membranes and damage proteins and DNA through oxidative stress. They react with other molecules converting them to free radicals. Our bodies fight them with the help of co-factors and antioxidants. Oxidative damage from oxygen-free radicals accumulates during the life cycle and has been implicated in aging and age-dependent diseases.
- (C) Our body has built-in defences against free radical molecules that break through cell membranes and damage proteins and DNA. Despite the presence of the cell's antioxidant defense system to counteract oxidative damage from ROS, oxidative damage accumulates during the life cycle and has been implicated in aging and age-dependent diseases such as cardiovascular disease, cancer, neurodegenerative disorders and other chronic conditions.
- (D) Free radical molecules have a single unpaired electron in the outer orbit. They interact with proteins and DNA in old cells. They are attacked by antioxidants and co-factors. This results in old cells getting damaged.

33. When celluloid and cigarettes first embarked on their epic journey together, cigarettes signified all kinds of things. Sometimes they signified that you were cool (Katharine Hepburn in *The Philadelphia Story*); other times they implied that you were a red-hot she-cat (Rita Hayworth in *Gilda*). They were called upon to denote age, wisdom, rough-and-toughness, weary nonchalance (Humphrey Bogart), and simultaneously – though not usually in the same film – to bestow youthful, almost adolescent, innocence, naivety and elfin charm (Audrey Hepburn). In old movies, in other words, everyone with a personality smokes.
- (A) In old movies, smoking was almost a requirement for all types of characters, as it provided the key to understanding the character.
- (B) Smoking cigarettes in films has a number of connotations both positive and negative. Various actors use them to highlight different aspects of their character's personality.
- (C) Smoking in films once signified intelligence, coolness and sex appeal. Now it is shorthand for "loser". Cigarettes could have all sorts of connotations in old films, even contradictory ones.
- (D) When cigarettes were first featured in movies, the characters used them to represent all types of traits, both positive and negative.
34. Currently, the English Wikipedia has more than 50 official policies with a word count close to 150,000 (enough for a thick book). But that's just the tip of the administrative iceberg. In addition to the policies, there are guidelines and essays – more than 450 devoted solely to proper conduct. You will also find more than 1,200 essays containing comments on the policies and guidelines, advisory notes, and analyses of the community. The total word count for all guidelines and essays can easily be in the magnitude of millions. It is safe to assume that no one in the world knows them all, and that Wikipedians really wallow in creating norms and regulations. I should know – I am one. But this is madness! With such a massive amount of rules and regulations to adhere to, how is it not absolutely deterring for newcomers to join Wikipedia? Most likely, because they do not even know these rules exist. Counterintuitive as it may sound, in spite of all the regulations, it is perfectly fine and acceptable to just use common sense when editing Wikipedia, relying on one's best judgment on how to make it a better encyclopaedia.
- (A) Wikipedia has policies and guidelines, but they are not carved in stone; their content and interpretation can evolve over time. Their principles and spirit matter more than their literal wording, and sometimes improving Wikipedia requires making an exception.
- (B) There are enough rules and guidelines in the English Wikipedia to fill a thick book, so no one can follow them all. One should not follow an overly strict interpretation of the *letter* of policy without consideration for the *principles* of policies.
- (C) There is a plethora of rules, guidelines and essays in the English Wikipedia, that it is highly likely that nobody knows them all. While, newcomers at Wikipedia are usually unaware of the existence of these rules, mere commonsense is an adequate guide to editing the Wikipedia.
- (D) The English Wikipedia has a huge number of rules and guidelines, but not enough people who know them all. One can assume that people no longer bother learning them all as commonsense scores over rules when it comes to editing the Wikipedia.

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

**DIRECTIONS** for questions 35 to 38: Answer these questions on the basis of the information given below.

Two friends, Jordan and Bryant, had a basketball shootout, in which each player attempts to shoot the ball into the basket. There were ten rounds in total and in each round, each player had 20 attempts to shoot the ball into the basket. Every successful attempt resulted in one point to the player. The cumulative accuracy for each player was calculated at the end of every round as the total number of successful attempts until the end of the round as a percentage of the total number of attempts made by the player until the end of the round. The following chart provides information on the cumulative accuracy of each of them at the end of every round:



**DIRECTIONS** for questions 35 to 38: Type in your answer in the input box provided below the question.

35. How many points were scored by Bryant in the fifth round?

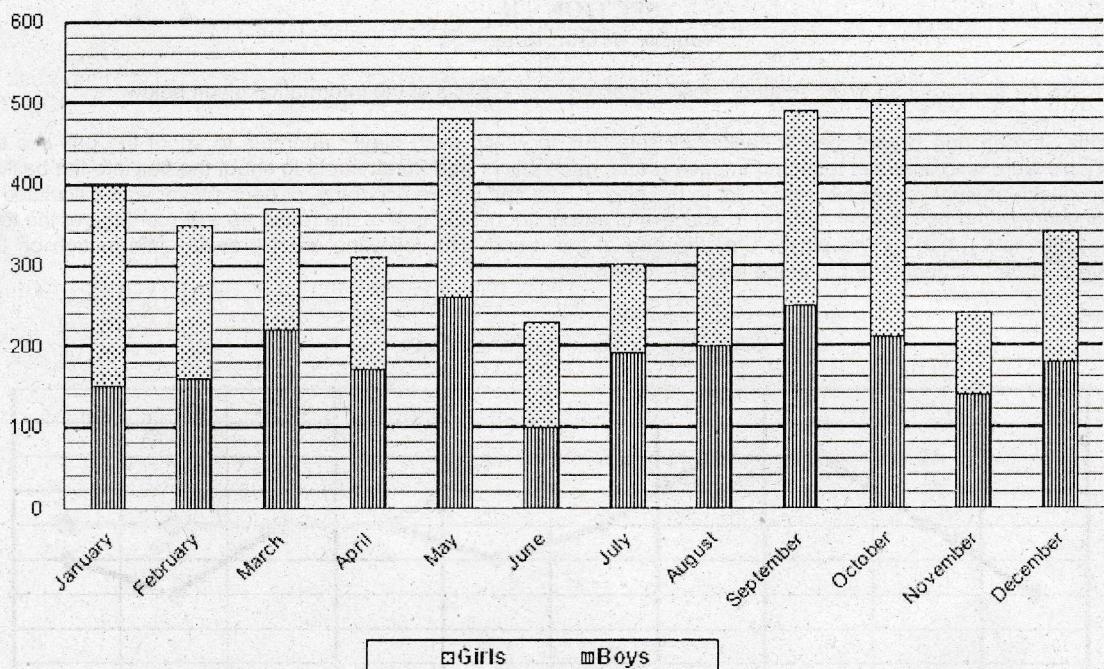
36. The total points scored by both the players combined was the highest in which round?

37. In how many rounds did Jordan score more points than Bryant?

38. If another player, LeBron, had an accuracy of 10% in Round 1, 20% in Round 2, 30% in Round 3 and so on, with 100% in Round 10, what would be the difference between the total points scored by LeBron and the total points scored by Jordan?

**DIRECTIONS** for questions 39 to 42: Answer these questions on the basis of the information given below.

In a country, the number of boys and girls born during each month in a particular year was calculated. Each month was ranked from 1 to 12, in the descending order of the total number of children born during that month, such that a numerically lower rank indicates that a higher number of children were born during that month. This rank is called Child Rank. Further, each month was also ranked by the number of boys born during the month, called Boy Rank, and the number of girls that were born during the month, called Girl Rank, in a similar manner. The following graph provides the number of boys and girls born during each month of that year:



**DIRECTIONS** for questions 39 to 42: Select the correct alternative from the given choices.

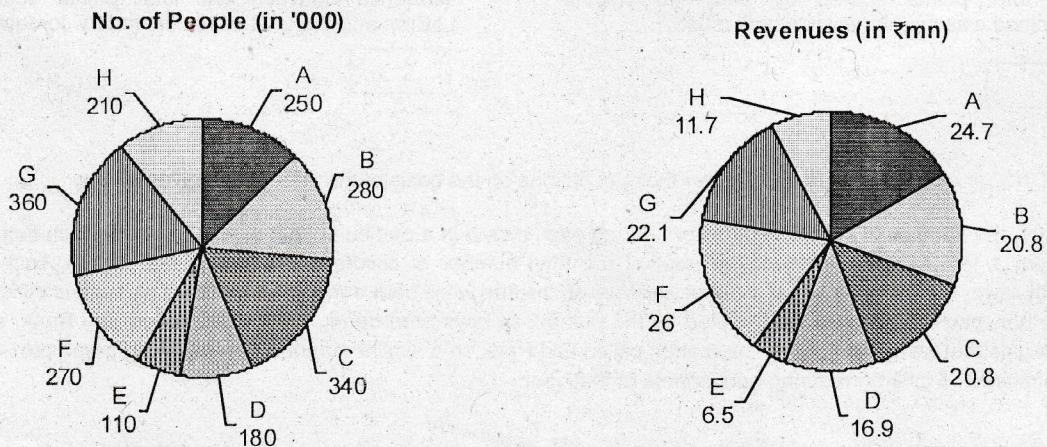
39. The number of children born in October as a percentage of the total number of children born during the year is  
 (A) 10.43%. (B) 11.55%.  
 (C) 12.23%. (D) 5.54%.
40. For which month is the sum of Child Rank, Boy Rank and Girl Rank the highest?  
 (A) June (B) July  
 (C) November (D) October

41. For how many months are at least two of the three ranks the same?  
 (A) 7 (B) 6 (C) 5 (D) 4

42. For how many months was the number of girls born as a percentage of the number of boys born greater than 120%?  
 (A) 3 (B) 2 (C) 5 (D) 4

**DIRECTIONS** for questions 43 to 46: Answer these questions on the basis of the information given below.

During a year, eight movies – A through H – were released. Each movie was watched by a certain number of people. However, the people who watched any movie either watched it in a theatre or watched a pirated print of the movie. Every person who watched a movie in a theatre paid exactly ₹130 for purchasing a ticket, whereas the persons who watched a pirated print did not spend any money for watching the movie. Also, each person watched only one movie and watched it only once. Each movie made a revenue which was equal to the product of the ticket price and the number of people who watched the movie in a theatre. The following pie-charts give the total number of people who watched each movie (in '000) and the total revenues made by the movie (in ₹ mn):



**DIRECTIONS** for questions 43 to 46: Select the correct alternative from the given choices.

43. What is the total number of people who watched any of the eight movies in a theater?  
 (A) 1,200,000      (B) 1,250,000  
 (C) 1,150,000      (D) 1,100,000
44. What is the number of people who watched movie B in a theater as a percentage of the total number of people who watched movie B?  
 (A) 57.14%      (B) 59.86%  
 (C) 54.35%      (D) 52.13%
45. The number of people who watched a pirated print as a percentage of the total number of people who watched the movie is the highest for  
 (A) Movie E.      (B) Movie C.  
 (C) Movie G.      (D) Movie H.
46. For how many of the eight movies did more than half the total number people who watched the movie, watch it in a theatre?  
 (A) 2      (B) 3      (C) 4      (D) 5

**DIRECTIONS** for questions 47 to 50: Answer these questions on the basis of the information given below.

Ten players, A through J, played a football match by dividing themselves into two teams of five players each – Team Red and Team Blue. They played a single match which was for 90 minutes. During these 90 minutes, the ball was always in possession of a player from either of the teams. The following table provides the number of goals scored by each player and the duration (in minutes) for which the ball was in possession of each player:

Player	Goals Scored	Possession Time (minutes)
A	2	11
B	3	20
C	0	3
D	2	2
E	4	25
F	2	10
G	5	13
H	0	2
I	0	2
J	1	2

Further, it is also known that

- (i) Team Red won the match by scoring one goal more than Team Blue.
- (ii) the possession time for Team Blue was ten minutes more than that for Team Red.
- (iii) B was part of Team Red.
- (iv) at any point of time, exactly one player, of either team, was in possession of the ball

**DIRECTIONS** for questions 47 to 50: Select the correct alternative from the given choices.

47. Who among the following is a part of Team Red?  
 (A) A      (B) D      (C) E      (D) F
48. Who scored the maximum number of goals in Team Blue?  
 (A) E      (B) G  
 (C) B      (D) Either E or G
49. Which of the following pairs of players belong to the same team?  
 (A) H, I      (B) D, F  
 (C) F, J      (D) C, J
50. If the 'Player of the Match' title was awarded to the player from the winning team who scored at least two goals and possessed the ball for the maximum duration, who was awarded the 'Player of the Match'?  
 (A) G      (B) E      (C) A      (D) B

**DIRECTIONS** for questions 51 to 54: Answer these questions on the basis of the information given below.

Eight students, A through H, were initially ranked in from 1 to 8 on the basis of their performance in a test, such that a numerically lower rank is a better rank. However, it was later found that three of the eight students had cheated in their test. These three students were subsequently removed from the rankings and the remaining five students were given revised ranks, from 1 to 5, based on their performance in the same test. The following information is known about their initial ranks and revised ranks:

- (i) A was initially ranked three places below B.
- (ii) The revised rank of C was worse than the initial rank of F.
- (iii) G was initially ranked better than H and neither of them cheated nor was either of them initially ranked first.
- (iv) E was initially ranked worse than B but better than C.
- (v) Only in the revised rankings was the number of students ranked better than D greater than those ranked worse.

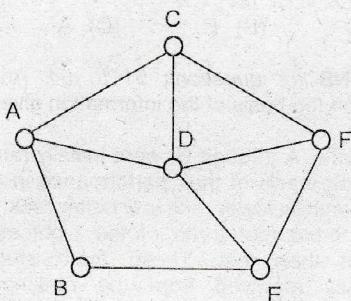
**DIRECTIONS** for questions 51 to 54: Select the correct alternative from the given choices.

51. Which student was ranked first initially?  
 (A) B      (B) D      (C) F      (D) C
52. The rank of which of the following students changed after revising the ranks?  
 (A) C      (B) A      (C) D      (D) F
53. The number of students for whom the ranks did not change after revising the ranks was  
 (A) 1.      (B) 2.      (C) 3.      (D) 4.
54. The best rank obtained by any of the students who cheated was  
 (A) first rank.  
 (B) fifth rank.  
 (C) fourth rank.  
 (D) sixth rank.

**DIRECTIONS** for questions 55 to 58: Answer these questions on the basis of the information given below.

Six towns, A through F, are connected by two-way roads as shown in the adjoining figure. Seven persons, Praveen, Rahul, Satish, Tarun, Vatsal, Yasim and Zakir, travelled from town A to town F, such that each person visited any town at most once. Also, no two persons passed through the same set of towns when travelling from town A to town F. Further, it is also known that

- (i) Praveen and Tarun were the only people to travel on the road connecting town D and town F.
- (ii) while both Rahul and Satish travelled through town C, Vatsal did not.
- (iii) Rahul was the only person who travelled through both town B and town D, while Satish did not travel through town E.
- (iv) while Yasim travelled on the road connecting town E and town F, he did not travel through town D.



**DIRECTIONS** for question 55: Select the correct alternative from the given choices.

55. Which of the following routes did Vatsal travel along?  
(A) ADF  
(B) ADEF  
(C) ACDEF  
(D) Cannot be determined

**DIRECTIONS** for question 56: Type in your answer in the input box provided below the question.

56. What is the number of towns, including A and F, through which Zakir travelled?

**DIRECTIONS** for questions 57 and 58: Select the correct alternative from the given choices.

57. Which of the following is a correct combination of town and the number of people who travelled through that town?  
(A) Town E, 3  
(B) Town D, 3  
(C) Town B, 4  
(D) Town C, 4

58. What is the route followed by Satish?  
(A) ADCF  
(B) ACDEF  
(C) ACF  
(D) Cannot be determined

**DIRECTIONS** for questions 59 to 62: Answer these questions on the basis of the information given below.

The Research and Development (R&D) Chief of a mobile manufacturing company has to design a phone. He shortlisted ten features – Symbian OS, Android OS, Infrared, Bluetooth, LCD, AMOLED, IPSLED, Quad core, GPS and HD Recording – which can be included in the phone. However, he has to include the features while making sure that the following conditions are satisfied:

- (i) The phone must include either Infrared or Bluetooth, but not both.
- (ii) Symbian OS and Android OS cannot be included in the phone together.
- (iii) If he includes GPS, it must also include Symbian OS and vice versa.
- (iv) The phone must include exactly one among LCD, AMOLED and IPSLED.
- (v) Symbian OS and Quad core cannot be in the phone together.
- (vi) If the mobile includes one among IPSLED, HD Recording and Android OS, it must also include the other two.

**DIRECTIONS** for questions 59 to 61: Select the correct alternative from the given choices.

59. If exactly five of the ten features are to be included in the phone, which among the following must be included?  
(A) AMOLED  
(B) Symbian OS  
(C) LCD  
(D) Quad core
60. If it is known that GPS is included in the phone, then what is the maximum number of features that can be included in the phone (including GPS)?  
(A) 2  
(B) 3  
(C) 4  
(D) 5
61. If only three of the ten features were included in the phone, then which among the following is definitely not included?  
(A) LCD  
(B) Symbian OS  
(C) Bluetooth  
(D) Quad core

**DIRECTIONS** for question 62: Type in your answer in the input box provided below the question.

62. Among the ten features, at most how many can be included in the phone?

**DIRECTIONS** for questions 63 to 66: Answer these questions on the basis of the information given below.

Fifteen students, A through O, in a class wrote exams in three subjects, Mathematics, Physics and Chemistry. However, each student failed in at least one subject. The following information is known about the number of students that failed the exams:

- (i) The number of students who passed only in Mathematics and Physics is the same as the number of students who passed only in Chemistry.
- (ii) The number of students who passed in Mathematics is 10.

- (iii) K and O failed only in Mathematics, whereas A, D and F failed in all the three subjects.
- (iv) The students who failed only in Physics are only B, E, G and H.

**DIRECTIONS for question 63:** Type in your answer in the input box provided below the question.

63. How many students failed in Mathematics or Chemistry?

**DIRECTIONS for question 64:** Select the correct alternative from the given choices.

64. In which subject did the maximum number of students fail?  
 (A) Mathematics  
 (B) Physics  
 (C) Chemistry  
 (D) Cannot be determined

**DIRECTIONS for question 67:** Select the correct alternative from the given choices.

67. If the product of a surd  $a + \sqrt{b}$  and its conjugate is 33 and the product  $ab$  is 18, which of the following can be the value of  $a$ ?  
 (A) 2      (B) 3      (C) 6      (D) 9

**DIRECTIONS for questions 68 and 69:** Type in your answer in the input box provided below the question.

68. The ages of Ram and Raj are in the ratio 4:5. If fifteen years ago their ages were in the ratio 3:5, what will be the sum of their ages five years from now?

 years

69. If the roots of the equation  $x^2 - ax + b = 0$  are 2 and 3, and the roots of the equation  $x^2 + ax + \beta = 0$  are  $a$  and  $b$ , then what is the value of  $a + \beta$ ?

**DIRECTIONS for questions 70 and 71:** Select the correct alternative from the given choices.

70. A shopkeeper had 15 cartons of pencil boxes with him and each carton had 120 pencil boxes, with each pencil box having 15 pencils. If the shopkeeper was able to sell only 10% of the pencils present in 15% of the pencil boxes in 20% of the cartons that he had, how many pencils was the shopkeeper able to sell?  
 (A) 81      (B) 99      (C) 72      (D) 78

71. Ramu had two jars, one of which had 1 litre of 40% milk and the other, 1 litre of 18% milk. If he mixed 300 ml of the former and 700 ml of the latter to form

**DIRECTIONS for question 65:** Type in your answer in the input box provided below the question.

65. How many students failed in Chemistry?

**DIRECTIONS for question 66:** Select the correct alternative from the given choices.

66. Which of the following is the highest?  
 (A) The number of students who failed only in Physics or only in Mathematics.  
 (B) The number of students who failed in Mathematics or Chemistry.  
 (C) The number of students who failed only in Chemistry and Physics.  
 (D) The number of students who failed in exactly one subject.

### SECTION – III

Number of Questions = 34

a new solution, what is the ratio of water and milk in the solution?

- (A) 32 : 93      (B) 377 : 123  
 (C) 417 : 83      (D) 747 : 253

**DIRECTIONS for question 72:** Type in your answer in the input box provided below the question.

72. In a restaurant, the cost of an idly is half that of a dosa and the cost of a dosa is one-third that of a poori. If the cost of an idly, a dosa and a poori combined is ₹108, what is the cost of a poori?

₹

**DIRECTIONS for questions 73 to 75:** Select the correct alternative from the given choices.

73. If  $(10110101101110)_2 = (X)_{16}$ , then find the number of digits in  $X$  each of which is less than 9.  
 (A) 1      (B) 2      (C) 3      (D) 4

74. If  $x + 2y = 2$  and  $3x - ay = -5$  intersect in the first quadrant, which of the following values can  $a$  assume?  
 (A) -5.5      (B) -4.9      (C) 5.5      (D) 4.9

75. If 4 men and 2 women can do a job in 15 days and 5 men and 4 women can do the same job in 9 days, in how many days can 6 men do the job?  
 (A) 45 days      (B) 15 days  
 (C) 22.5 days      (D) 7.5 days

**DIRECTIONS for question 76:** Type in your answer in the input box provided below the question.

76. Find the sum of all positive even numbers less than 300 which are not divisible by 7.

**DIRECTIONS** for question 77: Select the correct alternative from the given choices.

77. If the volume of a cylinder decreased by half and its radius decreased by 25%, what is the percentage reduction in its height?

- (A)  $16\frac{1}{6}\%$       (B)  $11\frac{1}{9}\%$   
 (C)  $12\frac{2}{3}\%$       (D)  $9\frac{1}{11}\%$

**DIRECTIONS** for question 78: Type in your answer in the input box provided below the question.

78. Raju travels from his home to office on the metro every day for 15 km, at an average speed of 47 kmph, and for 20 km on his bike, at an average speed of 30 kmph. If Raju wants to reduce his total travel time from home to office by 20 minutes, find the speed at which he must travel on his bike (assume that the average speed of the metro remains the same).

 kmph

**DIRECTIONS** for questions 79 and 80: Select the correct alternative from the given choices.

79. The LCM of two distinct prime numbers  $a$  and  $b$  is divisible by  $c$ , which is greater than both  $a$  and  $b$ . What is the value of  $c$ ?

- (A)  $a+b$   
 (B)  $ab$   
 (C)  $a+2b$   
 (D) Cannot be determined

80. If  $\log_{10} a^2 b = 5$  and  $\log_{10} \left( \frac{a}{b^2} \right) = 8$ , then find the value of  $a$ .

- (A)  $10^{18}$       (B)  $10^{\frac{9}{2}}$   
 (C)  $10^2$       (D)  $10^{\frac{18}{5}}$

**DIRECTIONS** for question 81: Type in your answer in the input box provided below the question.

81. How many four-letter words can be formed by using the letters of the word PROPORTION, such that all the four letters are distinct?

**DIRECTIONS** for questions 82 to 84: Select the correct alternative from the given choices.

82. Tarun and Varun invested in a business in the ratio of 4:5, at the beginning of a year. If Tarun withdrew from the partnership after eight months, what percentage of the annual profit will Tarun receive?

- (A) 34.78%      (B) 33.33%  
 (C) 29.63%      (D) 35%

83. For an infinite geometric progression, with common ratio  $r$ , if the ratio of the sum to infinite terms to the

sum to  $n$  terms is approximately 1.1444, which of the following combinations of values can  $r$  and  $n$  assume?

- (A)  $r = 0.547, n = 5$       (B)  $r = 0.772, n = 8$   
 (C)  $r = 0.697, n = 7$       (D)  $r = 0.711, n = 9$

84. At a traffic signal, the durations for which the green light, amber light and red light are kept on are in the ratio 6:1:2 from 8:00 AM to 10:00 PM and in the ratio 3:1:4 from 10:00 PM to 8:00 AM. What is the total duration for which the green light will be on in 24 hours? (Assume that a light of only one colour is on at any time.)

- (A) 13 hours and 5 minutes  
 (B) 12 hours and 20 minutes  
 (C) 11 hours and 15 minutes  
 (D) 15 hours and 10 minutes

**DIRECTIONS** for question 85: Type in your answer in the input box provided below the question.

85. The average weight of five persons in a group was 76 kg. After one year, the average weight of the same group became 81 kg. If each person in the group gained at least 2 kg, what is the maximum weight that any person in the group could have gained?

 kg

**DIRECTIONS** for questions 86 to 88: Select the correct alternative from the given choices.

86. When  $x$  and  $y$  are divided by 52 and 31 respectively, the remainders left are 23 and 19 respectively. Which of the following statements is definitely true?

- (A)  $x$  is odd and  $y$  is even.  
 (B)  $x$  can be even or odd and  $y$  is odd.  
 (C)  $x$  is even and  $y$  can be even or odd.  
 (D)  $x$  is odd and  $y$  can be even or odd.

87. Two balls are picked at random from a bag containing 4 red balls and 6 green balls. What is the probability that both the balls are of the same colour?

- (A)  $\frac{7}{15}$       (B)  $\frac{19}{45}$       (C)  $\frac{11}{45}$       (D)  $\frac{2}{9}$

88. Tap A and Tap B, when opened simultaneously, completely fill an empty tank in 20 minutes. If Tap A alone can fill three - quarters of the tank in 33 minutes, how long will it take Tap B alone to completely fill the tank?

- (A) 35 minutes      (B) 34.33 minutes  
 (C) 36.67 minutes      (D) 34 minutes

**DIRECTIONS** for questions 89 and 90: Type in your answer in the input box provided below the question.

89. For making an alloy, three metals, lead, zinc and iron, are to be mixed in the ratio of 2 : 3 : 5 respectively. What is the maximum quantity of alloy that can be made with 6 kg lead, 10 kg zinc and 14 kg iron?

 kg

90. If  $f(x)$  is a linear function of  $x$  and  $f(x) - f(-x) = 4x$  and  $f(x) + f(-x) = 4$ , then find the value of  $f(31)$ .

**DIRECTIONS** for questions 91 to 93: Select the correct alternative from the given choices.

91. A shopkeeper purchases ten watches at a price of ₹2000 each. He later finds out that two of the watches are defective and cannot be sold. What should be the selling price of each watch that he sells, if he is to earn a 15% profit overall?

(A) ₹2,300                  (B) ₹2,375  
 (C) ₹2,875                  (D) ₹3,125

92. Ravi started sharpening a new pencil which was initially in the shape of a cylinder of height 10 cm and diameter 0.5 cm. After sharpening the pencil, the height of the conical part, near the tip of the pencil (due to sharpening), was found to be 1 cm and the overall height of the pencil (including the conical part at the tip) was reduced by 10% compared to its initial height. What was the change in volume of the pencil due to sharpening?

(A) 0.327  $\text{cm}^3$                   (B) 0.435  $\text{cm}^3$   
 (C) 0.214  $\text{cm}^3$                   (D) 0.498  $\text{cm}^3$

93. The roots of a quadratic equation are in the ratio  $a : b$  and the product of the roots is  $4ab$ . If the sum of the roots is  $k(a+b)$ , find  $k$ .

(A)  $\pm 2$                   (B)  $\pm 4$   
 (C)  $\pm 8$                   (D)  $\pm 16$

**DIRECTIONS** for questions 94 to 97: Type in your answer in the input box provided below the question.

94. Sundar and Kishan run a 500 m race in which Kishan maintains a constant speed of 5 miles per hour, while Sundar runs at a speed of 8 miles per hour for the first 150 m and at a speed of 4 miles per hour for the remaining part of the race. What is the distance (in meters), rounded off to the nearest integer, by which the winner beats the loser of the race? (1 mile = 1.6 km)

 m

95. If the difference between the simple interest and annually compounded interest on a sum of 'P', when invested for a period of 2 years at a rate of interest of 8% per annum, is ₹64, find P.

₹

96. How many three-digit even numbers which are divisible by 11 also have the sum of their digits equal to 10?

97. If  $f(n) = f(n-1) \times 2^n$ ,  $f(0) = 4$  and  $f(22) = 2^k$ , then find the value of  $k$ .

**DIRECTIONS** for questions 98 and 99: Select the correct alternative from the given choices.

98. If the lengths of the sides of a right-angled triangle are  $(3x+3)$  units,  $(4x+5)$  units and  $(5x+2)$  units, find the area (in sq.units) of the triangle, rounded off to the nearest integer.

(A) 17                  (B) 18  
 (C) 19                  (D) Cannot be determined

99. ABCD is a square, of side 7 units, in the co-ordinate plane, such that the origin lies within the square. If AB is parallel to the  $y$ -axis and A is at  $(-4, 2)$ , what are the coordinates of C?

(A)  $(3, -5)$                   (B)  $(-4, -5)$   
 (C)  $(3, 9)$                   (D)  $(-4, 3)$

**DIRECTIONS** for question 100: Type in your answer in the input box provided below the question.

100. If  $4x + 3y - 2z = 10$  and  $x, y$  and  $z$  are distinct positive integers less than 10, what is the maximum value that  $x$  can assume?