VARC

DIRECTIONS *for questions 1 to 6:* The passage given below is followed by a set of six questions. Choose the best answer to each question.

A poet, somewhere in Siberia, or the Balkans, or West Africa, 60,000 years ago, recites thousands of memorised lines in the course of an evening. The lines are packed with fixed epithets and clichés. The bard is not concerned with originality, but with intonation and delivery: he or she is perfectly attuned to the circumstances of the day, and to the mood and expectations of his or her listeners. The poet's words would in no way have been anchored in visible signs, in text. Words had no worldly reality other than the sound made when they were spoken.

It is difficult to imagine how differently language would have been experienced in a culture of 'primary orality'. There would be nowhere to 'look up a word', no authoritative source telling us the shape the word 'actually' takes. Say it over and over again, or it will slip away. This necessary condition of survival is important for understanding the relatively repetitive nature of epic poetry. In the absence of fixed, textual anchors for words, there would be a sharp sense that language is charged with power, almost magic: the idea that words, when spoken, can bring about new states of affairs in the world. They do not so much describe, as invoke.

Writing was developed, first in the ancient Near East and soon after in Greece. Words were now anchored and, though spellings could change from one generation to another, or one region to another, there were now physical traces that endured, which could be transmitted, consulted and pointed to in settling questions about the use or authority of spoken language.

Writing rapidly turned customs into laws, agreements into contracts, genealogical lore into history. What had once been fundamentally temporal and singular was transformed into something eternal (as in, 'outside of time') and general. Even the simple act of making everyday lists of common objects - an act impossible in a primary oral culture - was already a triumph of abstraction and systematisation. From here it was just one small step to 'philosophy'.

Homer's epic poetry, which originates in the same oral epic traditions as those of the Balkans or of West Africa, was written down, frozen, fixed, and from this it became 'literature'. There are no arguments in the *Iliad*: much of what is said arises from metrical exigencies, the need to fill in a line with the right number of syllables, or from epithets whose function is largely mnemonic (and thus unnecessary when transferred into writing). Yet Homer would become an authority for early philosophers nonetheless: revealing truths about humanity not by argument or debate, but by declamation, now frozen into text.

Plato would express extreme concern about the role, if any, that poets should play in society. But he was not talking about poets as we think of

them: he had in mind reciters, bards who incite emotions with living performances, invocations and channellings of absent persons and beings. It is not orality that philosophy rejects, necessarily: Socrates himself rejected writing. Plato would also ensure the philosophical canonisation of his own mentor by writing down what Socrates would have preferred to merely say, and so would have preferred to have lost to the wind. Arguably, it is in virtue of Plato's recording that we might say, today, that Socrates was a philosopher.

Plato and Aristotle, both, were willing to learn from Homer, once he had been written down. And Socrates, though Plato still felt he had to write him down, was already engaged in a sort of activity very different from poetic recitation. This was dialectic: the structured, working-through of a question towards an end that has not been predetermined - even if this practice emerged indirectly from forms of reasoning only actualised with the advent of writing.

Q1. According to the passage, three of the following choices are true of the bard in Siberia or the Balkans or West Africa, 60,000 years ago. Pick the exception.

a) He would have made use of visible signs in writing and bothered about the original source of his recitation.
b) He would have used sobriquets in his verse extensively.
c) He would have been concerned with inflection and tone.
d) He would have kept in mind the expectations of the people who listened to his monologue.

Q2. Which of the following can best be inferred from the sentence "This necessary condition of survival is important for understanding the relatively repetitive nature of epic poetry" (para 2)?

a) About 60,000 years ago, there was no authoritative source for word organization or a fixed textual anchor for words.
b) There would be no way to affirm the word's existence at all except by speaking it.
c) The scholarly world has newly awakened to the oral character of language.
d) The shift from epic poetry to literacy involved a shift from magic to science, from 'pre-logical' to rational, from repetition to original.

Q3. Consider the statement given below:
As a consequence of the development of writing, old habits of thought began to die out, and certain other, previously latent, mental faculties began to express themselves.

Based on the passage, we can conclude that this statement is

a) definitely true.
b) probably true.
c) probably false.
d) cannot be determined.

Q4. Which of the following choices correctly cites the difference between Socrates and Plato, as can be ascertained from the passage?

a) Plato loathed the reciters and bards of his day while Socrates eulogized them.
b) Plato identified himself with a form of oral culture and Socrates went beyond poetic recitation to evolve dialectic reasoning.
c) Socrates identified himself with a form of oral culture while Plato preferred to write down what he heard in discourses.
d) There is no difference cited in the passage - both Plato and Socrates were willing to learn from Homer once he had been written down.

Q5. What is the primary concern of the author in the passage?

a) To make us understand the scope and nature of philosophical enquiry.
b) To discuss the intellectual importance of the writing process.
c) To explain how philosophy evolved.
d) To discuss how philosophy came to disdain the wisdom of oral cultures.

Q6. What can be inferred from the passage regarding philosophy?

a) Philosophy first developed in the ancient Near East and then in Greece.
b) The metrical exigencies in Homer's *Illiad* became the base for the development of philosophy.
c) Without oral culture, hypotheses in philosophy could never be made.
d) The emergence of writing has facilitated the development of philosophy.

DIRECTIONS *for questions 7 to 12:* The passage given below is followed by a set of six questions. Choose the best answer to each question.

In the 1980s companies often paid stratospheric prices to acquire established brands. With many of the best brands snapped up, extending existing brands is becoming popular again.

From booze to lipstick, consumer brands were the prizes which sparked some of the biggest takeover battles and grandest break-up schemes of the 1980s. Bidders and break-up artists thought they could sell well-known brands or exploit them better than existing managers.

The steam has gone out of the takeover market, and few big brands still carry "for sale" signs. After a massive reshuffle of brand portfolios, managers in consumer goods industries are returning to an old standby of marketing: brand-stretching.

Brand stretching - using the recognition value and reputation of a brand-name in a new product area - is often a quick and cheap way for a company to invade a new market. But brands are not endlessly elastic. Stretching can also undermine the credibility of the original product. Consumers either may not believe that the new product shares any of the characteristics of the old, or they may simply forget what was attractive about the original item. Nevertheless, many companies are beginning to stretch their brands for the same reason that they once scrambled to buy established brands at ever-higher prices: launching a new brand can be even riskier and more expensive. Nielsen, a market-research firm, found that, of America's top twenty-two brands back in 1925, nineteen still led their product categories 60 years later. Britain's top ten grocery brands have an average age of forty-two.

Brand-stretching can save money. OC & C, a London based consultancy, recently studied five years worth of new-product launches by one multinational client. Its findings? The advertising and promotion costs per consumer persuaded to try out each new product were 36% less for stretched brands than for completely new ones. Not only did stretched products need less advertising, but consumers were also more willing to give names they already knew an initial trial.

Even well after a new product's launch, stretched brands have a higher survival rate. OC & C found that, of products launched by the same multinational six years ago, only about 30% of new brands exist today, while over 50% of stretched ones do.

Another concept which has caught on in recent times is personal branding. This is the practice of people marketing themselves and their careers as brands. While previous self-help management techniques were about self-*improvement*, the personal-branding concept suggests instead that success comes from self-*packaging*.

Personal branding often involves the application of one's name to various products. Donald Trump uses his last name extensively on his buildings and on the products he endorses (e.g. Trump Tower). "Your brand is a perception

or emotion, maintained by somebody other than you, that describes the total experience of having a relationship with you."

Branding is all about product perception. And when that product is you, it's even more critical the branding process be so perfect that the decision can't be anything but in your favour. That, in a nutshell, is the premise of Peter Montoya's *The Brand Called You.* According to it, a personal brand is 'a personal identity that stimulates precise, meaningful perceptions in its audience about the values and qualities that person stands for, personally and professionally.' And, before you ask, no, it's not the same as advertising and PR. The purpose of creating a personal brand is not to make you famous, emphasises Montoya. It's about enhancing your sphere of influence, because that's what generates wealth. Of course, you may become famous, but that's just a welcome extra, not the ultimate goal. A personal brand is about keeping you and your business top-of-mind, telling people you can create value and helping business come to you, rather than have you scout for work. Personal branding is a reflection of reality. .... Montoya lists several strategies for creating a personal brand, from the obvious (send targeted press releases, maintain a Web site and pay personal attention to customers) to the unusual (create a personal brochure and use it instead of business cards, send out personal postcards instead of the usual direct mailers).

Q7. All of the following can be possible reasons for the managers in consumer goods industries to return to brand-stretching EXCEPT?

    1.   Companies in the consumer goods sector that have paid inflated price for brands in the past few years are under greater pressure than ever to get more out of their expensive acquisitions.

    2.   Many of the best brands have been bought and the price of creating new brands is soaring.

    3.   The recognition value and reputation of a brand name can be used to gain traction in a new product market.

    4.   Brands were over-valued in the eighties and consumers no longer retain the features of the original product in their memory.

 a) Only a
 b) b and c
 c) a and d
 d) Only d

Q8. What can be inferred from the finding of Nielsen's research on brands as presented in the passage?

 a) Consumers take a long time to place their trust in a particular brand but once their trust is betrayed, they can renounce their faith in the brand in a very short span of time.
 b) Brand loyalty of consumers in the 1980s was questionable.

c) Once established brands are difficult to displace.

d) The risks of brand-stretching are outweighed by the fact that it is considerably easy and cheaper to market stretched brands than to launch new brands.

Q9.   It can be inferred from the passage that stretched brands

a) emerged, as a concept, after the biggest takeover battles and grandest break-up schemes of the 1980s began to lose their glamour.

b) have a higher survival rate and cost less per customer than new brands.

c) almost always end up undermining the credibility of the original version.

d) provided a powerful counterweight to takeover battles and break-up schemes of the 1980s.

Q10.   With reference to the self-promotion strategies that Montoya mentions in his book, it can be inferred that

a) he advocates a personal touch in all of one's dealings.

b) he supports the ample use of mass media.

c) his approach comes across as familiar as well as atypical.

d) All of the above.

Q11.   According to Montoya, how is personal branding different from advertising and PR?

a) Personal branding lays more emphasis on personalized approach whereas advertising and PR are more customary.

b) The former establishes your identity while advertising and PR modify your perceptions.

c) In the case of the former, the emphasis is more on communicating your self-worth, whereas the latter aims at making you well-known.

d) Personal branding is a reflection of reality whereas advertising and PR project larger than life images of the product.

Q12.   Which of the following cannot be inferred about personal branding from the passage?

a) Becoming famous is not the primary objective in personal branding.

b) Personal branding can enhance the emotional connection or experience with a client and can increase your net worth.

c) Your personal brand is the mental impression prospective associates have of you.

d) Self-improvement is thought to be as significant a skill set as self-packaging in the personal branding exercise.

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.

Scientists find it difficult to know which facts are important and which irrelevant, unless they already have a framework or theory into which they could fit the facts. This is not being 'unscientific' in any way. Scientists do not work with unambiguous facts, they have to place facts in context, to interpret them within a particular framework or theory. In cosmology or atomic physics, this process is relatively uncontroversial. But when we are dealing with the question of human nature /origins, the creation of the framework within which one places the facts can be contentious, and open to political, philosophical and cultural influences. Virtually all our evolutionary theories about human origins are relatively unconstrained by fossil data. They have often said far more about the theorists than about what actually happened.

Today, the questions of 'how and when did we become human?' remain culturally loaded. The key issue for many Darwinists is the similarity of humans and apes. Humans share 98 percent of their genes with chimpanzees. If we take away our clothes, possessions and language, observes Jared Diamond, then we begin to look like an ape. If we remove our marks of humanity, we no longer appear to be human: not a very profound claim. But Diamond doesn't leave it there. Humanity without their humanity are revealed to be 'what they really are'. Diamond's argument is that 'what we really are', the essence of humanity, has little to do with conventional indices of humanness: language, culture, technology, and so on. Rather it is expressed principally through our animal heritage.

The genetic proximity of Man and ape is without question. One could say, given the tiny genetic difference, that our humanity does not lie in our genes. Or one could argue we are little more than another ape, and the roots of our behaviour must lie in our animal, and in particular ape, ancestry. In adopting the second argument, Darwinists like Diamond are doing more than taking an objective look at the human condition. They are interpreting the scientific data through a particular philosophical lens. They are projecting their vision of what it means to be human on to the data.

For all Robert Foley's protestations, then, that evolutionary questions are merely technical ones, Darwinian explanations also draw on philosophical and cultural assumptions about what constitutes humanity, how humans relate to the non-human animal world. …. If the Victorian insistence on a biological chasm between man and ape originated from an almost mythical belief in human progress, today's insistence that humans are nothing more than another kind of ape is the consequence of a century's worth of disillusionment with such optimism. Foley notes: The history of the twentieth century has transformed our vision of humanity, leading to a 'loss of confidence in the extent to which humans could be said to be on a pedestal above the swamp of animal brutishness.'

The almost boundless capacity of humans to do damage to each other has, in the twentieth century, rather dented human self-esteem. ..... Apes have become more angelic; the angels, or at least their human representatives, more apish. Originally, humans were thought to be the advanced form of life (the angels), and other animals the more primitive, now it may be argued that the animal within us is our noble side, and humanity the darker side - a complete reversal of the original Victorian image. ....

The fact that scientific explanations of humanness are shaped by wider influences does not necessarily mean that they are wrong. We have to understand arguments about human nature as simultaneously scientific and cultural claims. We need to ask ourselves two intertwined questions. First, what data have scientists produced about human origins, human behaviour, the human mind? And second, what is it about humanness that is being said through particular interpretations of this data? i.e., What does science tell us about being human, and what do scientific theories about human origins tell us about the non-scientific influences upon their stories? Putting the two together will tell us much, both about humanness and about the present state of humanity.

Q13. Which of the following correctly points out the difference in the field of cosmology and evolutionary biology as discussed in the first para of the passage?

 a) In the former, one does not work with unambiguous facts while in the latter, theorists work with ambiguous facts that are influenced by philosophy and culture.
 b) In the former, theories are twisted to suit facts while in the latter, facts are twisted to suit theories.
 c) In the former, the creation of the framework within which one places the facts is uncontroversial, but in the latter it is controversial.
 d) In the former, one considers it a capital mistake to theorize before one has data while in the latter, one projects contemporary concerns onto the past.

Q14. What is the style of the passage?

 a) Narrative.
 b) Analytical.
 c) Descriptive.
 d) Argumentative.

Q15. In the author's opinion,

 a) Jared Diamond implies that the essence of humanity lies in our inherited traits.
 b) Jared Diamond believes that clothes, possessions, cuture, technological and linguistic prowess are the distinguishing features of man.
 c) Man's genetic similarity to apes leads him to behave in a beastly manner.
 d) If an ape wore clothes and could talk, it would be indistinguishable from man.

Q16. Which of the following stories pertaining to today's times would be told by a Darwinist to highlight the essence of humanity?

 a) The story of the ascent of man from his brutish origin.
 b) The tale of the fall of man back into beastliness.
 c) The story of the descent of Man and the ascent of humanity.
 d) The story of the convergence of the human and ape evolutionary tree lines.

Q17. All of the following are true from the passage EXCEPT?

 a) Man's inhumanity to man casts a doubt on his superior position in creation.
 b) Robert Foley believes that man's evolution can be explained by answering technical questions.
 c) Jared Diamond believes that man's humanness is due to his animal ancestry.
 d) Scientific explanations of humanness are not unerring as other aspects sometimes have bearing on them.

Q18. The primary purpose of the passage is to show that

 a) segregating facts from subjective interpretation will give us answers about human nature.
 b) theories regarding human nature or origins are shaped by socio-cultural influences.
 c) fossil data reveal more about the anthropologists who made the discovery than about human beings.

d) the study of human nature is totally different from that of cosmology and atomic physics.

DIRECTIONS *for questions 19 to 21:* The passage given below is followed by a set of three questions. Choose the best answer to each question.

How good are graphic novels, really? Are these truly what our great-grandchildren will be reading, instead of books without pictures? They are beginning to be taken seriously by the critical establishment. Some of the graphic novels are much better than others, obviously, but this is true of books of any kind. And the form is better-suited to certain themes and kinds of expression than others. One thing the graphic novel can do particularly well, for example, is depict the passage of time, slow or fast or both at once -- something the traditional novel can approximate only with empty space. The graphic novel can make the familiar look new. The autobiographical hero of Craig Thompson's "Blankets," a guilt-ridden teenager falling in love for the first time, would be insufferably predictable in a prose narrative; here, he has an innocent sweetness.

The graphic novel is also good at depicting blankness and **anomie**. This is a strength of Daniel Clowes's, and also of 30-year-old Adrian Tomine, who may, incidentally, be the best prose writer of the bunch. (He became an English major at the University of California, Berkeley, because the art department had no use for representation, let alone comics.) His young people, falling in and out of relationships, paralyzed by shyness and self-consciousness, might be unendurable if depicted in prose alone. Why would we care? But in Tomine's precisely rendered drawings (which owe something to Clowes, something to the Hernandez brothers and maybe even a tiny debt to the painter Alex Katz) they take on a certain dignity and individuality.

The graphic novel is great for stories of spookiness and paranoia, as in David Mazzucchelli's graphic adaptation of Paul Auster's novella, "City of Glass," where the panels themselves become confining and claustrophobic, or in Charles Burns's creepy "Black Hole," a story about a plague spread by sexually active teenagers. ("Black Hole" is still unfinished, and some graphic artists talk about it the way people talked about "Ulysses" back when it was appearing in installments.) And of course, drawing as it does on the long tradition of comic and satiric art, the graphic novel can be very funny.

In fact, the genre's greatest strength and greatest weakness is that no matter how far the graphic novel verges toward realism, its basic idiom is always a little, well, cartoonish. This is a medium probably not well suited to lyricism or strong emotion, and the very best graphic novels don't take themselves entirely seriously. They appeal to that childish part of ourselves that delights in caricature, and they rely on the magic, familiar but always a little startling, that reliably turns some lines, dots and squiggles into a face or a figure. It's a trick of sorts, but one that never wears out.

Q19. What is the author's attitude towards graphic novels?

 a) His attitude can be said to be one of qualified appreciation.
 b) He lists only their merits but with patronising undertones.
 c) Though he likes them on the whole, he feels that they have no literary merit.
 d) He finds them unappealing at best, but is resigned to the fact that they are probably the literary form of the near future.

Q20. The word 'anomie' in the passage refers to
Identify all that apply and enter the corresponding number in the input box given below. You must enter your answer in increasing order only. For example, if you think (1) and (2) apply, then enter 12 (but not 21) in the input box.

    1.   blank spaces in a work of art.
    2.   satire that can be depicted in art.
    3.   hostile and belligerent attitudes of society.
    4.   indifference of a nation.
    5.   the absence of social standards or parameters.

Q21. According to the passage, graphic novels do all of the following EXCEPT?

    1.   They indicate the passage of time.
    2.   They can incorporate humour in art.
    3.   They always take themselves very seriously.
    4.   They delight in caricature and can showcase a plethora of emotional states.
    5.   They convert a familiar image into a new one.

 a) a and c
 b) b and e
 c) a, c and d
 d) Only c

DIRECTIONS *for questions 22 to 24:* The passage given below is followed by a set of three questions. Choose the best answer to each question.
Kurt Vonnegut once advised: "We are what we pretend to be, so we must be careful about what we pretend to be." The idea that people become what they do is my favourite idea. This explanation of how people acquire

attitudes and traits was formalized by the social psychologist Daryl Bem in his self-perception theory. People draw inferences about who they are, Bem suggested, by observing their own behaviour. Self-perception theory turns common wisdom on its head. People act the way they do because of their personality traits and attitudes, right? They return a lost wallet because they are honest and recycle their trash because they care about the environment. While it is true that behaviour emanates from people's inner dispositions, Bem's insight was to suggest that the reverse also holds. If we return a lost wallet, there is an upward tick on our honesty meter. After we drag the recycling bin to the curb, we infer that we really care about the environment. Hundreds of experiments have confirmed the theory and shown when this self-inference process is most likely to operate (e.g., when people believe they freely chose to behave the way they did, and when they weren't sure at the outset how they felt).

Self-perception theory is elegant in its simplicity. But it is also quite deep, with important implications for the nature of the human mind. Two other powerful ideas follow from it. The first is that we are strangers to ourselves. After all, if we knew our own minds, why would we need to guess what our preferences are from our behaviour? If our minds were an open book, we would know exactly how honest we are. Instead, we often need to look to our behaviour to figure out who we are. Self-perception theory thus anticipated the revolution in psychology in the study of human consciousness, a revolution that revealed the limits of introspection. But it turns out that we don't just use our behaviour to reveal our dispositions - we infer dispositions that weren't there before. Often, our behaviour is shaped by subtle pressures around us, but we fail to recognize those pressures. As a result, we mistakenly believe that our behaviour emanated from some pre-existing **inner disposition.** For instance, our competitive spirit may prompt behaviour that is considered altruistic, but we believe it to be an innate altruism at work.

Q22. The boldfaced part of the text can be best replaced by .....?

 a) strongest tendencies
 b) characteristic tendencies
 c) inherent strengths
 d) immanent tendencies

Q23. Which of the following is true from the passage?

 a) Most people know how they will behave most of the times.
 b) We can identify the pressures that make or mar our behaviour.
 c) We sometimes use effect to misidentify cause.
 d) Self-perception theory states that people act the way they do because of their personality traits and attitudes.

Q24. Consider the statement given below:

It is implicit in several versions of psychotherapy, in which clients are encouraged to change their behaviour first, with the assumption that changes in their inner dispositions will follow.

How does the above statement relate to the main point of the passage?

a) It reveals an alternate side to the theory.

b) It shows how the theory can be misused due to an inherent flaw.

c) It describes a hypothetical situation and argues in favour of a particular hypothesis of the theory.

d) It reiterates a point of the theory and mentions its practical implication.

Q25. DIRECTIONS *for questions 25 to 27:* Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. In the wake of this discovery, serum therapy became, until the invention of antibiotics, the main way of treating diphtheria, tetanus, scarlet fever and meningitis.

2. The first Nobel prize in medicine, awarded in 1901, went to Emil von Behring for discovering how to employ antitoxins to treat diphtheria.

3. Evolution being what it is, bacteria will no doubt find ways around antibodies, as they have with antibiotics.

4. He found that he could transfer them from infected horses to sick people by injecting those people with horse-blood serum.

5. It is still employed for neutralizing snake venom and - albeit experimentally - for treating Ebola fever.

Q26. DIRECTIONS *for questions 25 to 27:* Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. This year's contest includes a robotic garden, too: students at the University of Colorado are developing a workable prototype "bioregenerative food system," which they'll deliver to NASA next summer.

2. Stored food represents the largest expected non-propulsion consumable mass for human spaceflight.

3. The designs often focus on space-worthy structural scaffolds, detailing vertical or horizontal building layouts that could survive the harsh environment on Mars or the moon.

4. The completed project will be able to grow, harvest and compost a variety of plants which astronauts can cultivate for food.

5. NASA's yearly X-Hab competition invites university teams to design deep space habitats and concepts that could someday be used by real astronauts.

Q27. DIRECTIONS *for questions 25 to 27:* Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. Besides portraits, they also perfected the art of carving intricate relief decoration and, through keen observation of the natural world, produced detailed images of animals, plants, and even landscapes.

2. During this period, artists learned to express their culture's worldview, creating for the first time images and forms that endured for generations.

3. Egypt's Old Kingdom (Dynasties 3-6, ca. 2649-2150 B.C.) was one of the most dynamic periods in the development of Egyptian art.

4. During the Old Kingdom, the king of Egypt (not called the Pharaoh until the New Kingdom) became a living god, who ruled absolutely and could demand the services and wealth of his subjects.

5. They mastered the techniques necessary to build monumental structures in stone and created the earliest portraits of individuals and lifesize statues in wood, copper, and stone.

Q28. DIRECTIONS *for questions 28 to 32:* Arrange the sentences numbered 1 to 4 between the header and the footer to form a coherent paragraph. Key in the correct sequence of these 4 numbers in the input box given below the question.

Header: Russia was for many centuries separated, geographically and politically, from the development of Western civilization and culture, and thus came late into the modern age.

1. Industrialization was proceeding at a level only two or three decades behind that of the United States.

2. By the time the country was overtaken by the First World War, its situation was not entirely discouraging.

3. Secondly, there was under implementation a program of education reform which, if allowed to continue unimpeded, would have assured total literacy within another two decades.

4. But the eighteenth and nineteenth centuries, witnessing as they did an extensive overcoming of these earlier barriers, permitted a very considerable progress in the modernization of Russian society.

Footer: And the first really promising program for the modernization of Russian agriculture (the so-called Stolypin reforms), while by no means yet completed, was proceeding steadily and with good chances for ultimate success.

Q29. DIRECTIONS *for questions 28 to 32:* Arrange the sentences numbered 1 to 4 between the header and the footer to form a coherent paragraph. Key in the correct sequence of these 4 numbers in the input box given below the question.

Header: Recently, education has become the focus of significant interest in Silicon Valley, the world's most successful site of technical and economic innovation.

1. As a result, a distinctive approach to education has emerged within Silicon Valley itself.

2. That year saw the publication of a report by Global Silicon Valley (a merchant bank that has advised, invested in and accelerated many technology companies) entitled *American Revolution 2.0*

3. Established Silicon Valley technology companies, wealthy philanthropic entrepreneurs, venture capital investors, and new startup organizations have become committed to educational innovation and reform particularly since 2012.

4. It described key technical catalysts for educational transformation and reform - such as cloud computing, wired classrooms, low-cost hardware, and software - and estimated the K-12 education market to be worth over $2.2 trillion.

Footer: The new Silicon Valley venture philanthropists, and the projects they promote and invest, take software development and computational products as the model for the future practices of education.

Q30. DIRECTIONS *for questions 28 to 32:* Arrange the sentences numbered 1 to 4 between the header and the footer to form a coherent paragraph. Key in the correct sequence of these 4 numbers in the input box given below the question.

Header: Archaeology is concerned with understanding societies that existed in the past.

1. We can use the techniques of archaeology to uncover the skeletal remains of our ancestors from the distant past.

2. Archaeologists excavate or survey the remains of societies that existed many thousands of years ago or the remains of societies from recent times.

3.   As Louis Leakey showed us, our early human ancestors probably hunted and foraged for food on the continent of Africa long before North and South America or Australia were inhabited by people.

4.   The exciting findings of human paleontology (the study of fossils) have pushed back our ancestry as tool-using humans who walked on two legs to several million years ago.

Footer: Although we have learned a great deal about our ancestors within the last few decades, we are far from having a clear picture of our evolutionary history, and there is still much more to learn.

Q31. DIRECTIONS *for questions 28 to 32:* Arrange the sentences numbered 1 to 4 between the header and the footer to form a coherent paragraph. Key in the correct sequence of these 4 numbers in the input box given below the question.

Header: Once upon a time, $3 billion was the magic number that brought the full sequencing of a human genome to life.

1.   From there, chemicals are applied to the sample in order to break open the cell membranes and gather the DNA housed inside of them.

2.   Less than a teaspoon of blood or saliva samples are collected from the patient.

3.   Genomic sequencing reveals the secrets our genes keep from us. So how is this actually done?

4.   Today, it has decreased to just a few thousand dollars and continues to become more cost-effective.

Footer: Sophisticated machines analyze these sequences for about 2-3 months to find what essentially the errors are across the 20,000 genes we all possess.

Q32. DIRECTIONS *for questions 28 to 32:* Arrange the sentences numbered 1 to 4 between the header and the footer to form a coherent paragraph. Key in the correct sequence of these 4 numbers in the input box given below the question.

Header: Our lack of awareness about the capacity, and potential of human consciousness and its role in our evolutionary development, has brought humanity to a critical threshold.

1.   Our inability or unwillingness to bring conscious spirituality to the forefront of our lives has fostered a collective state of passivity and even apathy.

2.   A revolution in human consciousness is now required in order to break the spell of our ignorance.

3.   Now that we have the capacity to engage with spiritual impulses, environmental impacts are being supplied that have the potential to catalyze in us new patterns of consciousness, with emerging faculties of heightened perception and understanding.

4.   Such new energies may also assist in opening up transcendental patterns of thought that would bring humanity into a more direct relationship with intelligent cosmic forces, thus breaking the collective coma of our cosmic isolationism.

Footer: It is possible that a new state of quantum consciousness will allow humanity access to an unimaginable energetic field of information which would open up new vistas of creative intelligence that are hitherto closed to us.

Q33. DIRECTIONS *for questions 33 and 34:* The following question has a paragraph from which a sentence has been left out. From the given options, choose the one that completes the blank in the paragraph in the most appropriate way. Enter the number alongside the correct answer choice in the input box given below the question.

Societies differ greatly in their scale and complexity. India has a population of around 1,343,677,902 divided by language, religion, region, sect, caste, tribe, wealth, occupation, education and income. It is also a nation state with a formal legal and administrative structure designed to maintain some measure of unity without doing violence to the distinctive lifestyles cherished by its major religious and cultural groups. Indians believe, rightly or wrongly, that the tolerance of diversity is a core value, within the Indian tradition. _____

1.   This in turn has paved the way for the growth of religious tolerance.

2.   But an effective administrative system is required to keep this in check.

3.   This tolerance has laid the foundation for the growth of democracy.

4.   This tolerance has contributed a great deal to the growth of a pluralist democracy.

5.   Religious intolerance still proves to be a major hurdle in the process of attainment of a pluralist democracy.

Q34. DIRECTIONS *for questions 33 and 34:* The following question has a paragraph from which a sentence has been left out. From the given options, choose the one that completes the blank in the paragraph in the most

appropriate way. Enter the number alongside the correct answer choice in the input box given below the question.

Now that the genetic blueprint of man and the virus is known, it is likely that a satisfactory treatment and prevention will be the fruit of genetic researches. Though gene therapy is in its infancy, it holds promise for many incurable diseases including AIDS. Introduction of protein that inhibits the viral life cycle, expression of protein that prevents the virus attacking the cells of the immune system and ribozyme engineering to destroy the viral genome are some of the methods under consideration. In July 2002, a human gene that protects the body from HIV infection was identified by a team of Anglo-American scientists. The gene is named CEM 15 and confers natural resistance to HIV infection. This gene is knocked off by a small protein in the virus called 'virion infectivity factor' (VIF).

_____

1.   This failure reflects the inefficiency of gene therapy when diseases like AIDS are in question.

2.   This would mean that those whose genetic makeup includes this gene have only a marginally better chance than others, in the fight against AIDS.

3.   Hence the knowledge of the structure of the virus is necessary for further investigation.

4.   This does not mean, however, that hope is lost.

5.   If a drug can be designed to neutralize the VIF, it would allow CEM 15 to work normally and prevent the HIV infection.

DILR

DIRECTIONS *for questions 1 to 4:* Answer these questions on the basis of the information given below.
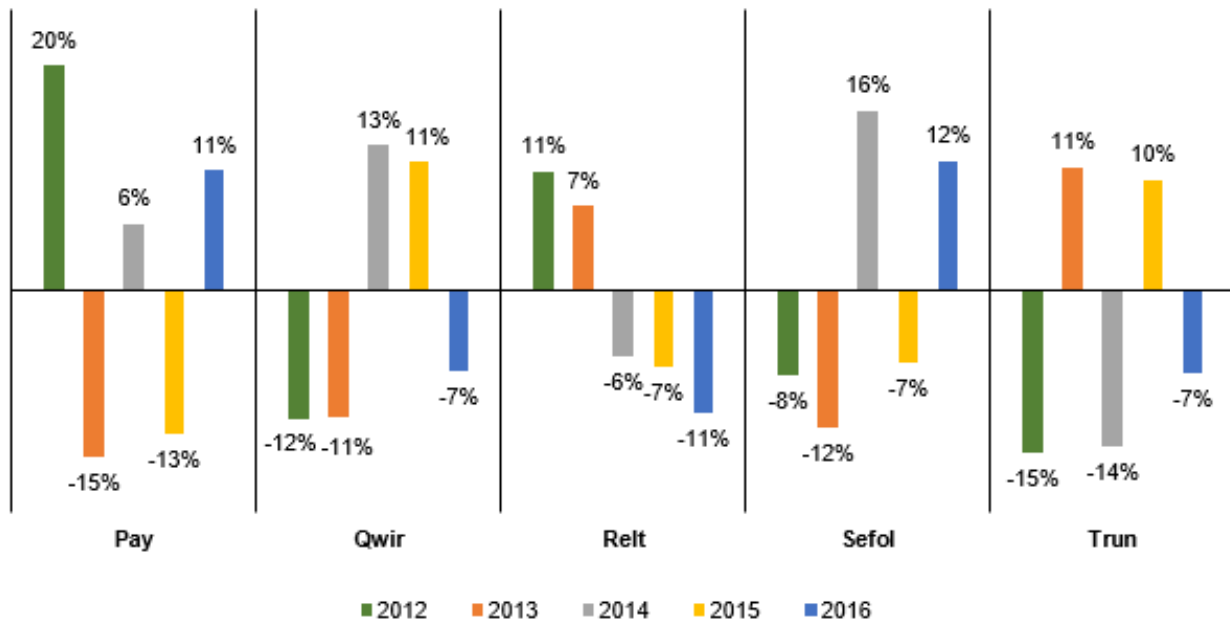
Nuer Group, a conglomerate, comprises five companies - Pay, Qwir, Relt, Sefol and Trun. Four persons - Adam, Bill, Chandu and Devon - were made the heads of some of these five companies from 2012 to 2016. Each of the four persons headed exactly one of the five companies during each year and no person headed the same company for more than one year. No company was headed by more than one person in any year. Further, it is known that

1.   when Adam was made the head of a company in any year, the revenue of the company increased by at least 10% as compared to the previous year.

2.   when Bill was made the head of a company in any year, the revenue of the company decreased by at least 10% as compared to the previous year.

     3.   when Chandu was made the head of a company in any year, the revenue of the company increased by at least 5% as compared to the previous year.

     4.   when Devon was made the head of the company in any year, the revenue of the company decreased by at least 5% as compared to the previous year.

The following graph provides the percentage increase in the revenue of each of the five companies for each year, from 2012 to 2016, as compared to the previous year:

Q1. DIRECTIONS *for questions 1 to 4*: Select the correct alternative from the given choices.
During which of the following years was none of the four persons the head of Qwir?

 a) 2012
 b) 2013
 c) 2014
 d) 2015

Q2.
DIRECTIONS *for questions 1 to 4*: Select the correct alternative from the given choices. The head of Sefol in 2014 was the same as the head of

 a) Pay in 2012.
 b) Relt in 2013.
 c) Trun in 2015.
 d) Qwir in 2015.

Q3.   DIRECTIONS *for questions 1 to 4*: Select the correct alternative from the given choices.

During the given period, what is the ratio of the revenue of Pay in the year that Adam was made its head to that in the year that Devon was made its head (approximately)?

 a) 1.1765
 b) 1.2757
 c) 1.0236
 d) 1.11

Q4.   DIRECTIONS *for questions 1 to 4*: Select the correct alternative from the given choices.

During the given period, for how many companies was Devon made the head of that company before Chandu was made the head?

 a) 2
 b) **1**
 c) **0**
 d) **3**

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

Exactly ten persons, A through J, are part of the same family and live in the same house. The ten persons belong to three different generations such that exactly two persons, who are a married couple (i.e., a husband and a wife), belong to the oldest generation and they have exactly two children, one of whom, in turn, has three children, while the other is not married.

The following information is known about the persons who live in the house:

        1.   F, who is a male, has two sisters and only one of the sisters is married.

        2.   The sister-in-law of H is married to the son of A, while the brother-in-law of B is married to the daughter of D.

        3.   Both B and J are female.

        4.   E, who is the daughter-in-law of J, has three children.

        5.   H, who is a male, is the uncle of C, while C has at least one sibling.

        6.   G is a female.

Q5.   DIRECTIONS *for questions 5 to 8*: Select the correct alternative from the given choices.

Who is the spouse of C?

a) **J**
b) **G**
c) **I**
d) C is not married.

Q6.   DIRECTIONS *for questions 5 to 8*: Select the correct alternative from the given choices.
How is D related to G?

a) Mother-in-law
b) Father-in-law
c) Husband
d) Mother

Q7.   DIRECTIONS *for questions 5 to 8*: Select the correct alternative from the given choices.
Which of the following pairs of persons live in the house?

a) I and the brother of I's mother-in-law
b) B and the sister of B's mother
c) A and the brother of A's father
d) G and the brother of G's father-in-law

Q8.   DIRECTIONS *for questions 5 to 8*: Select the correct alternative from the given choices.
Which of the following pairs of persons represent a mother and her son (in any order)?

a) E, B
b) D, C
c) J, H
d) G, D

DIRECTIONS *for questions 9 to 12:* Answer these questions on the basis of the information given below.
Four persons went to a supermarket and each of the four persons purchased a certain number of erasers, pens, pencils, staplers and crayons. The price of each item of a particular type is the same. Further, for each person, the number of items of each type that he purchased, when arranged in ascending order, form five consecutive integers.
The following table provides the total amount spent (in Rs.) in purchasing each type of item by each person:

Person	Erasers	Pens	Pencils	Staplers	Crayons
A	320	396	840	680	288
B	240	300	648	520	224
C	60	96	168	80	40
D	80	84	240	180	48

Q9.   DIRECTIONS *for questions 9 to 11:* Type in your answer in the input box provided below the question.
How many erasers did B purchase?

Q10.   DIRECTIONS *for questions 9 to 11:* Type in your answer in the input box provided below the question.
What is the total number of items of the five types purchased by D?

Q11.   DIRECTIONS *for questions 9 to 11:* Type in your answer in the input box provided below the question.
What is the total number of staplers the four persons purchased?

Q12.   DIRECTIONS *for question 12*: Select the correct alternative from the given choices.
For how many persons can it be said that the type of item on which they spent the highest amount and the type of item for which the number of items purchased by them is the highest are the same?

a) **0**
b) **1**
c) **2**
d) **4**

DIRECTIONS *for questions 13 to 16:* Answer these questions on the basis of the information given below.
Hari, a school teacher, is organizing a school trip and he has to select a team, comprising a few boys and girls, to take with him to the school trip from among the students in his class. There were exactly twelve students in his class and each student plays exactly one game among three different games - Hockey, Volleyball and Basketball. Further, among the twelve students, each student likes exactly one subject among two subjects - Mathematics and Biology.
It is also known that, in the team that Hari selects, IF there is

1.   exactly one boy who likes Mathematics, the maximum number of students in the team can be 10.
2.   exactly one student who plays Volleyball, the maximum number of students in the team can be 9.
3.   exactly one student who likes Biology, the maximum number of students in the team can be 9.
4.   exactly one student who likes Mathematics and plays Hockey, the maximum number of students in the team can be 10.
5.   exactly one boy who likes Biology and plays Basketball, the maximum number of students in the team can be 9.
6.   exactly one boy who plays Hockey and exactly one girl who plays Volleyball, the maximum number of students in the team can be 9.

Q13.   DIRECTIONS *for question 13*: Select the correct alternative from the given choices.
How many girls are there among the twelve students?

a) **3**
b) **4**
c) **5**
d) Cannot be determined

Q14.   DIRECTIONS *for questions 14 and 15:* Type in your answer in the input box provided below the question.
If Hari selects exactly one boy who likes Biology and exactly one girl who plays Hockey, what is the maximum number of students that he can select?

Q15.   DIRECTIONS *for questions 14 and 15:* Type in your answer in the input box provided below the question.
Among the twelve students, what is the number of girls who like Mathematics?

Q16.   DIRECTIONS *for question 16*: Select the correct alternative from the given choices.
Among the twelve students, how many girls play Volleyball?

a) **3**
b) **4**
c) **5**
d) Cannot be determined

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

In a library, a certain number of books were borrowed by its members during the month of November. The following table provides details regarding the number of books borrowed on different days in the month of November:

Number of Books Borrowed	Number of Days
At least 1	30
At most 2	10
At least 2	24
At most 4	16
At least 4	18
At most 6	24
At least 6	8
At most 8	29
At least 8	5
At most 10	30
At least 10	1

Q17. **DIRECTIONS** *for questions 17 and 18*: Select the correct alternative from the given choices.

On how1 many days during the month of November were exactly seven books borrowed?

a) **2**
b) **1**
c) **3**
d) **0**

Q18. **DIRECTIONS** *for questions 17 and 18*: Select the correct alternative from the given choices.

If each book that was borrowed was returned on the same day and an amount of Rs.5 was charged as the rental charge for each book borrowed, what is the total rental charge earned by the library in the month of November?

a) Rs.635

b) Rs.655
c) Rs.685
d) Rs.705

Q19.   DIRECTIONS *for question 19:* Type in your answer in the input box provided below the question.
If, during the month of November, the number of days on which exactly *n* books were borrowed was *D*n, what is the value of *n* for which *D*n is the lowest?

Q20.   DIRECTIONS *for question 20*: Select the correct alternative from the given choices.
How many of the following statements are true regarding the number of books borrowed during the month of November?
     1.   The number of days on which exactly three books were borrowed is greater than the number of days on which exactly five books were borrowed.
     2.   The number of days on which exactly five books were borrowed is less than the number of days on which exactly four books were borrowed.
     3.   The number of days on which exactly two books were borrowed is greater than the number of days on which exactly seven books were borrowed.
     4.   The number of days on which exactly three books were borrowed is less than the number of days on which exactly six books were borrowed.

a) **0**
b) **1**
c) **2**
d) **3**

DIRECTIONS *for questions 21 to 24:* Answer these questions on the basis of the information given below.
In a museum, six paintings were displayed on a wall from left to right. Each painting was of a different subject among Flower, Kitten, Ship, Apple, Fountain and Rock. Further, each painting was painted by a different artist among John, Vincent, Leonardo, Claude, Eduardo and Pablo.
It is also known that
     1.   the painting by Claude was to the immediate right of the painting of the Kitten, while the painting of the Flower was not painted by Pablo.
     2.   the painting by Eduardo was not adjacent to the painting by Leonardo, while the painting of a Rock was four places to the right of the painting by Vincent.

3.   the painting of the Flower was to the right of the painting by John but was not to its immediate right.

4.   the painting of the Apple and the painting by Pablo were at the two extreme ends.

5.   the painting of the Ship was to the immediate left of the painting by Eduardo, while the painting of the Rock was not at any extreme end.

Q21.   DIRECTIONS *for questions 21 to 24*: Select the correct alternative from the given choices.
Who painted the painting of the Ship?

a) Vincent
b) John
c) Leonardo
d) Eduardo

Q22.   DIRECTIONS *for questions 21 to 24*: Select the correct alternative from the given choices.
Which of the following is true regarding the painting that is to the immediate right of the painting by Claude?

a) The subject of the painting is a Flower.
b) The subject of the painting is a Rock.
c) It was painted by John.
d) More than one of the above

Q23.   DIRECTIONS *for questions 21 to 24*: Select the correct alternative from the given choices.
Which of the following paintings did Eduardo paint?

a) Painting of the Rock
b) Painting of the Fountain
c) Painting of the Flower
d) Painting of the Kitten

Q24.   DIRECTIONS *for questions 21 to 24*: Select the correct alternative from the given choices.
How many paintings are present between the painting by Leonardo and the painting of the Ship?

a) **0**
b) **1**
c) 2
d) More than 2

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

In a city, there are three types of city buses - Ordinary, Metro and Luxury. The price of the ticket for each bus depends on the distance for which a passenger travels. For travelling a distance which is at most 4 km, the price of the ticket for the three types of buses are Rs.20, Rs.30 and Rs.60 respectively. For each additional km or part thereof, the price of the ticket for the three type of buses increases by Rs.8, Rs.10 and Rs.20 respectively. Further, there is a monthly pass - enabling unlimited travel in a month - available for each of the three types of buses, priced at Rs.1000, Rs.2200 and Rs.6300 respectively. Any pass is valid only in the type of bus for which it is meant. Any passenger will try to minimize the total amount that he/she spends in each month on bus travel, i.e., on tickets or bus pass, considering the distance of his/her travel during the month and the cost of the monthly pass.

Q25. DIRECTIONS *for questions 25 to 28*: Select the correct alternative from the given choices.

Mahesh always travels by Luxury bus. Every day, he travels 3 km from home to office, 2 km from office to gym and x km from gym to his home. If Mahesh bought a monthly pass in every month of the year 2015, which of the following best describes x?

a) $x > 5$
b) $x > 5.5$
c) $x > 6$
d) $x > 6.25$

Q26. DIRECTIONS *for questions 25 to 28*: Select the correct alternative from the given choices.

On each day of the month of June 2016, Tarun travelled m km from home to office by a Metro bus and $\dfrac{3m}{2}$ km from office to home in a Luxury bus. If Tarun purchased a monthly pass for Luxury bus but did not purchase a pass for Metro bus, how many integral values can m assume?

a) 1
b) 2
c) 3
d) 0

Q27. DIRECTIONS *for questions 25 to 28*: Select the correct alternative from the given choices.

If Gaurav always travels by the same type of bus and he travels *n* km from home to office and *n* km from office to home every day, how many of the following statements are definitely true?

  1. If $n < 4.93$ and he always travels by Metro bus, he will not buy a monthly pass for the month of February 2015.

  2. If $n < 4.26$ and he always travels by Ordinary bus, he will not buy a monthly pass for the month of May 2016.

  3. If $n < 6.43$ and he always travels by Luxury bus, he will not buy a monthly pass for the month of February 2016.

a) **0**
b) **1**
c) **2**
d) **3**

Q28. **DIRECTIONS** *for questions 25 to 28*: Select the correct alternative from the given choices.

Hiren, Lal and Krish travel exactly once every day by Ordinary bus, Metro bus and Luxury bus respectively. Hiren, Lal and Krish did not buy a monthly pass for May 2015. If *h*, *l* and *k* represent the maximum distance that they could have travelled in a day, which of the following statements is true?

a) $h < k < l$
b) $h < l < k$
c) $k < h < l$
d) $l < h < k$

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

The entrance exam to a college comprised five sections - VA, RC, QA, DM and LA. Any student who attempts the exam has to spend exactly 30 min on each section and has to finish a section before he can start the next section. There are no breaks during the exam and the entire exam lasts for exactly 2.5 hours. However, before the start of the exam, each student chooses the order in which he wants to attempt the five sections.

Three students, Ankit, Pavan and Kiran, attempted this exam in the same venue. All the students started the exam at the same time.

Lalit, who was the invigilator at the venue, observed the following during the exam:

  1. At any point of time during the exam, all the three students were not attempting the same section.

  2. Pavan started the QA section exactly 30 minutes after Kiran started the QA section.

3.   Ankit finished the RC section before he finished the VA section, while Kiran started the VA section after the other two students finished the DM section.

4.   No student started the LA section after completing the DM section.

5.   Ankit started the QA section 30 min after Kiran finished the VA section, while Pavan started the RC section 30 minutes after Ankit started the VA section.

Q29.   DIRECTIONS *for questions 29 to 31*: Select the correct alternative from the given choices.
Which section was Kiran attempting when Ankit was attempting the VA section?

a) **LA**
b) **VA**
c) **RC**
d) None of the above

Q30.   DIRECTIONS *for questions 29 to 31*: Select the correct alternative from the given choices.
Which of the following sections was not the last section that any of the three students attempted?

a) **QA**
b) **RC**
c) **VA**
d) None of the above

Q31.   DIRECTIONS *for questions 29 to 31*: Select the correct alternative from the given choices.
For how many sections can it be said that Kiran started that section before any of the other two persons started that section?

a) **1**
b) **2**
c) **3**
d) **4**

Q32.   DIRECTIONS *for question 32:* Type in your answer in the input box provided below the question.
For how many minutes during the exam were each of the three students attempting a different section?
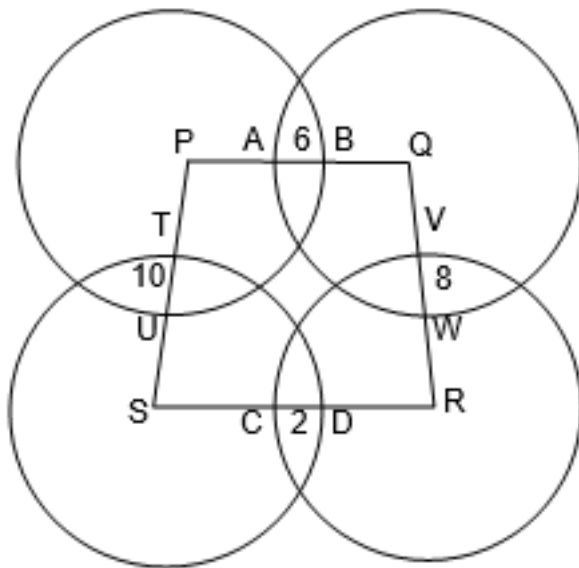
QA

Q1. **DIRECTIONS** *for questions 1 and 2*: Select the correct alternative from the given choices.
Let S1, S2 and S4 be the sums to the first *n*, 2*n* and 4*n* terms respectively of an arithmetic progression, with *a* as the first term and *d* as the common difference. If M = 2S1 + S2 - S4, then which of the following is true?

  a) M is dependent on only *n* and *d*
  b) M is dependent on only *d* and *a*
  c) M is dependent on only *a* and *n*
  d) M is dependent on *a, d* and *n*

Q2. **DIRECTIONS** *for questions 1 and 2*: Select the correct alternative from the given choices.
The figure below shows four circles with centres P, Q, R and S.

If the radius of each circle is equal to 26 cm, and TU = 10 cm, CD = 2 cm, AB = 6 cm and VW = 8 cm, find the perimeter of PQRS (in cm).

  a) **104**
  b) 182
  c) **156**
  d) **78**

Q3. **DIRECTIONS** *for question 3:* Type in your answer in the input box provided below the question.
A, B, C, D and E are five students who took CAT2007. The following are the averages of their overall scores, taken three at a time: 119, 121, 124, 125,

123, 126, 127, 128, 129 and 132. What is the highest score among the scores of A, B, C, D and E?

Q4. **DIRECTIONS** *for questions 4 to 9*: Select the correct alternative from the given choices.
Fourteen boys went to collect berries and returned with a total of 80 berries among themselves. If every boy collected at least one berry each, then what is the minimum number of pairs of boys that must have collected the same number of berries?

a) **0**
b) **1**
c) **2**
d) 3

Q5. **DIRECTIONS** *for questions 4 to 9*: Select the correct alternative from the given choices.
A string is cut into two parts. The ratio of the length of the whole string to that of the smaller part is the square of the ratio of the lengths of the larger and smaller parts. Approximately, what fraction of the length of the bigger part is the length of the smaller part?

a) 0.32
b) 0.42
c) 0.62
d) 0.72

Q6. **DIRECTIONS** *for questions 4 to 9*: Select the correct alternative from the given choices.

If
$$S = \sqrt{1+\frac{1}{4}+\frac{2}{2}} + \sqrt{1+\frac{1}{36}+\frac{2}{6}} + \sqrt{1+\frac{1}{144}+\frac{2}{12}} +$$
.... $$\sqrt{1+\frac{1}{422500}+\frac{2}{650}},$$ find the value of S.

a) $\dfrac{651}{26}$

b) $\dfrac{675}{26}$

c) $\dfrac{695}{26}$

d) $\dfrac{635}{26}$

Q7. DIRECTIONS *for questions 4 to 9*: Select the correct alternative from the given choices.

A set of 16 points lie on a plane. Of the given 16 points, a set of 5 points lie on the straight line ℓ and another set of 4 points lie on the straight line m. If no other straight line can be drawn passing through more than two of the 16 points, find the difference between the number of straight lines and line segments that can be drawn using the given points.
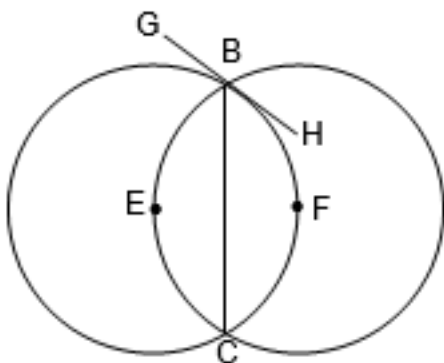
a) **14**
b) **0**
c) **12**
d) **8**

Q8. DIRECTIONS *for questions 4 to 9*: Select the correct alternative from the given choices.

Pavan is twice as old as his son and three times as old as his daughter. Find the ratio of Pavan's age to his son's age when Pavan's age becomes twice that of his daughter age.

a) $\dfrac{7}{4}$

b) $\dfrac{7}{5}$

c) $\dfrac{8}{5}$

d) Cannot be determined

Q9. DIRECTIONS *for questions 4 to 9*: Select the correct alternative from the given choices.

In the above figure, there are two equal circles (with centres E and F respectively), each passing through the centre of the other. B and C are their points of intersection. Find the measure of $\angle$ CBH if GH is the tangent to the circle with centre E, at B.

a) 60°
b) **45°**
c) **50°**
d) **55°**

Q10. DIRECTIONS *for question 10:* Type in your answer in the input box provided below the question.
What is the remainder when 3^1000 is divided by 91?

Q11. DIRECTIONS *for questions 11 and 12*: Select the correct alternative from the given choices.
The side of an equilateral triangle is equal to the perimeter of *a* square which is equal to the perimeter of *a* nonagon. The perimeter of the equilateral triangle is equal to the perimeter of *a* hexagon, which is equal to the perimeter of on octagon. If the sides of the equilateral triangle, square, nonagon, hexagon and the octagon are all integers (when expressed in cm) denoted by *a*, *b*, *c*, *d* and *e* respectively, which of the following is false?

a) $\dfrac{d}{b}$ is an integer

b) $\dfrac{c}{e}$ is an integer

c) $\dfrac{ad}{ae}$ is an integer

d) $\dfrac{e}{d}$ is an integer

Q12. DIRECTIONS *for questions 11 and 12*: Select the correct alternative from the given choices.
In the data set, {*a*, 0, 1, 6, 9, 10, 11}, consisting of seven distinct integers, one of the numbers is the mean as well as the median. How many values of '*a*' are possible?

a) **1**
b) **2**
c) **3**
d) **4**

Q13. DIRECTIONS *for question 13:* Type in your answer in the input box provided below the question.
Ajay and Brij start running simultaneously from the diametrically opposite ends of a circular track towards each other at 12 km/hr and 24 km/hr respectively. After every 8 minutes their speed reduce to half of their current

speeds. If the length of the circular track is 1500 m, how many times will they meet? (Assume that they only move along the circular path)
Mark your answer as '-1' if you think that they will meet an infinite number of times.

Q14. **DIRECTIONS** *for questions 14 and 15*: Select the correct alternative from the given choices.
A function $y = f(x)$ is said to be reflexive if $x = f(y)$. Which of the following is not a reflexive function?

a) $\dfrac{3x+5}{4x-3}$

b) $\dfrac{2x+3}{3x+2}$

c) $\dfrac{x+6}{6x-1}$

d) $\dfrac{4-x}{4x+1}$

Q15. **DIRECTIONS** *for questions 14 and 15*: Select the correct alternative from the given choices.
The sum of the lengths of the diagonals of a rhombus of side 5 cm is 12 cm. What is its area?

a) 24 cm2
b) 20 cm2
c) 11 cm2
d) **9 cm2**

Q16. **DIRECTIONS** *for questions 16 and 17:* Type in your answer in the input box provided below the question.
If $\dfrac{q+2r}{p} = \dfrac{r+2p}{q} = \dfrac{p+2q}{r} = k,$ where k is natural number. Find the value of the expression $\dfrac{3r+p}{p+q-r}.$

Q17. **DIRECTIONS** *for questions 16 and 17:* Type in your answer in the input box provided below the question.

The base 6 system of counting uses six distinct digits to represent any number. The non-negative integral numbers in this system can be listed in ascending order as 0, 1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 15, 20, 21, and so on. Find the sum (as expressed in base 6) of the first hundred numbers listed in the series given.

Q18. **DIRECTIONS** *for questions 18 to 21*: Select the correct alternative from the given choices.
The ten-digit number $9793a6160b$ is divisible by 11. If $0 < a < b$, find the sum of remainders when the number is divided by $a + b$ and a successively.

a) **6**
b) **3**
c) **2**
d) **9**

Q19. **DIRECTIONS** *for questions 18 to 21*: Select the correct alternative from the given choices.
During Diwali season, Jaideep a shop owner marked the price of an article 50% above the cost price and then offered a discount of 40%. Find the profit or loss per cent made by Jaideep if the cost price of the article was Rs.1050.

a) 10% profit
b) 10% loss
c) 30% profit
d) 30% loss

Q20. **DIRECTIONS** *for questions 18 to 21*: Select the correct alternative from the given choices.
There are n taps, numbered 1, 2, 3, …… n, fitted to a tank. If each tap, starting from the second tap, has a filling capacity equal to the sum of the filling capacities of all the taps numbered less than it, and the difference in the filling capacities of the twelfth tap and the eleventh tap is 1792 litres per hour, find the filling capacity (in litres per hour) of the eighth tap.

a) **448**
b) **896**
c) 224
d) Cannot be determined

Q21. **DIRECTIONS** *for questions 18 to 21*: Select the correct alternative from the given choices.

A king has 50 identical diamond rings, which he stores in five different coloured chests. In how many ways can the king store the rings among the chests such that every chest contains at least one ring?

a) **49C4**
b) **50C4**
c) **49C5**
d) **50C5**

Q22. DIRECTIONS *for question 22:* Type in your answer in the input box provided below the question.
For four positive real numbers, *a*, *b*, *c*, *d*, *ad = bc* and *a + b + c + d* = 20. The maximum value of *ad* is

Q23. DIRECTIONS *for questions 23 and 24*: Select the correct alternative from the given choices.
A milkman has six cans, each containing 10 litres of milk, of concentrations 20%, 30%, 40%, 50%, 70% and 80% respectively. If he mixed milk from exactly three of the cans to form one litre of milk of exactly 50% concentration, in how many ways could he have selected the three cans?

a) **14**
b) **15**
c) **16**
d) **17**

Q24. DIRECTIONS *for questions 23 and 24*: Select the correct alternative from the given choices.
A solid sphere in cut into 16 identical pieces with 5 cuts. What is the percentage increase in the combined total surface area of all the identical pieces over that of the original sphere?

a) 125%
b) 200%
c) 250%
d) 350%

Q25. DIRECTIONS *for question 25:* Type in your answer in the input box provided below the question.
The last digit of the LCM of (3^2003 − 1) and (3^2003 + 1) is
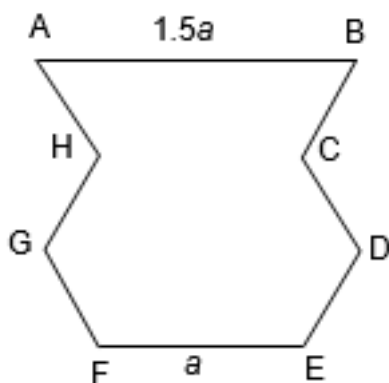
Q26. DIRECTIONS *for questions 26 to 28*: Select the correct alternative from the given choices.

Find the quadratic equation whose roots are half of the reciprocal of the roots of the equation $ax^2 + bx + c = 0$.

a) $4ax^2 + 2bx + c = 0$
b) $4cx^2 + 2bx + a = 0$
c) $2cx^2 + bx + a = 0$
d) $2ax^2 + bx + c = 0$

Q27. DIRECTIONS *for questions 26 to 28*: Select the correct alternative from the given choices.
Find the sum of all the interior angles of the concave octagon, ABCDEFGH, shown in the figure below. It is known that AB = 1.5 EF and AH = HG = GF = ED = DC = CB.

a) 720°
b) 900°
c) 1080°
d) Cannot be determined

Q28. DIRECTIONS *for questions 26 to 28*: Select the correct alternative from the given choices.
A certain number of cats eat a certain number of mice over a period of several days. Each cat eats the same number of mice, which is greater than the number of cats. If there are at least three cats and the total number of mice eaten is 999919, how many cats were there?

a) **667**
b) **899**
c) 1147
d) None of the above

Q29. DIRECTIONS *for question 29:* Type in your answer in the input box provided below the question.

A bag contains coins in denominations of one-rupee, fifty-paise and twenty-five paise. If the total values of the coins of the three denominations are in the ratio of 5 : 6 : 7 respectively and total number of coins is 135, then find the number of fifty-paise coins.

Q30. DIRECTIONS *for questions 30 to 33*: Select the correct alternative from the given choices.
If the equation of a tangent drawn from the origin to a circle with centre (2, −1) is $3x + y = 0$, then the equation of the other tangent from the origin to the circle is

a) $3x − y = 0$
b) $x + 3y = 0$
c) $x − 3y = 0$
d) $x + 2y = 0$

Q31. DIRECTIONS *for questions 30 to 33*: Select the correct alternative from the given choices.
Madhusudhan had a certain amount of diluted milk in which the ratio of milk to water was 4 : 5. He boiled the diluted milk with the intention of getting a concentration of 50%, but he boiled in excess and the initial ratio of milk to water was reversed. He boiled the milk for a total of $12^{6}/_{7}$ minutes. If the rate of evaporation of water is 50% more than that of milk, find the time for which the milk was boiled after having reached 50% concentration.

a)

$4^{6}/_{7}$ minutes

b)

$2^{6}/_{7}$ minutes

c)

$3^{6}/_{7}$ minutes

d)

$2^{34}/_{63}$ minutes

Q32. **DIRECTIONS** *for questions 30 to 33*: Select the correct alternative from the given choices.
If *a*, *b*, *c* and *d* are real numbers with *b* > 0, *d* > 0, and *ab* < *cd*, then which one of the following is always true?

a) $\dfrac{a}{b} < \dfrac{(a+c)}{(b+d)} < \dfrac{c}{d}$

b) $\dfrac{a}{b} < \dfrac{(a+c)}{(b-d)} < \dfrac{c}{d}$

c) $\dfrac{a}{b} < \dfrac{(a-c)}{(b+d)} < \dfrac{c}{d}$

d) $\dfrac{a}{b} < \dfrac{(a-c)}{(b-d)} < \dfrac{c}{d}$

Q33. **DIRECTIONS** *for questions 30 to 33*: Select the correct alternative from the given choices.
Two functions *f* and *g* are defined in such a manner that *f* (*a* + *b*) = *f* (*a*) *g*(*b*) + *g*(*a*) *f* (*b*) and *g*(*a* + *b*) = *g*(*a*) *g*(*b*) + *f* (*a*) *f* (*b*), for all real numbers *a* and *b*. Which of the following expressions is equal to *g*(3*a*)?

a) *f* (*a*3) + 3 *f* (*a*) *g*(*a*2)
b) [*f* (*a*)]3 + 3 *f* (*a*)[*g*(*a*)]2
c) [*g*(*a*)]3 + 3*g*(*a*) [*f* (*a*)]2
d) None of these

Q34. **DIRECTIONS** *for question 34:* Type in your answer in the input box provided below the question.
If *x* and *y* are positive integers and (*x* - 8) (*x* - 20) = 2^y, then find the number of ordered pairs (*x*, *y*) that are possible.