

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.

The vices are what strike you. The Mercedes AMG factory in Brixworth, a town in England's midlands, is a different world from that of the production line of yore. Engine making was once accompanied by loud noises and the smoke and smells of men and machinery wrestling lumps of metal. Here things are quiet and calm. Skilled mechanics wield high-tech tools amid operating-theatre cleanliness as they work on some of the best racing-car engines in the world. ... The only vestige of the old world are the vices. There is one on every work bench. At some point, making things of metal requires holding parts still, and nothing better than the vice has come along.

Manufacturing exerts a powerful grip on politicians and policymakers in the rich world. It is central to what they want for their countries, they say; it needs to be brought home from abroad; it must be given renewed primacy at home. This is because it used to provide good jobs of a particular sort – jobs that offered decent and dependable wages for people, particularly men, with modest skills, and would do so throughout their working lives. Such jobs are much more scarce than they once were, and people suffer from the lack of them. In their suffering, they turn to politicians – and can also turn against them.

Hence Donald Trump's promise to create "millions of manufacturing jobs"... Hence calls from the EU for a European industrial revolution and the need for things to be "Made in France" identified by Marine le Pen, leader of the country's National Front.

The problem with such oratory is that manufacturing has not really gone away. But nor has it held still. The vice has gone unreplaced, but in almost everything else there has been change aplenty. ...

Once you understand what manufacturing now looks like, you come to see that the way it is represented in official statistics understates its health, and that the sector's apparent decline in the rich world is overstated. But that does not solve the politicians' problem. ...

The structure of 20th-century manufacturing helped ensure that those better wages were indeed offered. Factories brought lots of modestly skilled people together with massive capital equipment that cost owners dearly when idled by strikes. Unionisation helped those workers win a large share of the value generated by industry.

In the latter part of the century, though, this system came undone. Better shipping and information technology allowed firms to unbundle the different tasks – from design to assembly to sales – that made up the business of manufacturing. It became possible to co-ordinate longer and more complicated supply chains, and thus for various activities to be moved to other countries, or to other companies, or both. At the same time computers and computer-aided design made automation more capable. High wages

gave owners the incentive they needed to take advantage of those opportunities. And while politicians now like the good jobs unionised factories provided, at the time when those unions were flexing their muscles many were happy to see them reined in.

As a result, many manufacturing jobs vanished from the rich world... The way official figures are put together means that these declines are exaggerated. But tens of millions of jobs did vanish, and as manufacturing became more productive, and prices dropped, its share of GDP fell, too. At the same time the number of people in manufacturing in developing countries exploded, with many of them working, directly or indirectly, for the same firms that were employing fewer people in rich countries. But the jobs that appeared were not, for the most part, simply the old jobs relocated. Companies were using technology and new practices in ways that made it easier to separate straightforward, well-delineated work from the more complicated bits of the enterprise. The routine work, which was not particularly valuable, was easily moved to poor countries where labour was cheap.

This is why promises to bring jobs back ring hollow. Valuable semi-skilled manufacturing jobs are not, for the most part, going to return to America, or anywhere else, because they were not simply shipped abroad. They were destroyed by new ways of boosting productivity and reducing costs which heightened the distinction between routine labour and the rest of manufacturing. There is no vice that can squeeze those genies back into their bottles.

Q1. What is the primary reason for the politicians in the rich world to say that manufacturing is central to their agenda, as can be inferred from the passage?

- a) Manufacturing is an important contributor to the GDP in many countries.
- b) Manufacturing offers steady jobs with decent wages to the people.
- c) People want steady jobs with good wages such as the ones that manufacturing used to provide.
- d) Unionization in the manufacturing sector affords the politicians better control over the economy.

Q2. What does the author imply when he says that “The vices are what strike you” in the Mercedes AMG factory?

- a) In the factory where everything is calm and quiet, the vices are the only implements that make noise.
- b) In the factory, everything looks tidy except for the vices.

- c) In the factory where everything is state of the art, the vices are the only implements that are out-of-date.
- d) In the factory, the vices are the only piece of technology that have not been replaced since older times.

Q3. Which of the following are the reasons that the official statistics understate the health of manufacturing sector?

1. Productivity increased in the manufacturing sector.
2. Manufacturing firms transferred some of the jobs to the developing countries.
3. The contribution of the manufacturing sector to the GDP decreased.

- a) Only I and II
- b) Only II and III
- c) Only I and III
- d) Only II

Q4. Which of the following is true according to the passage?

- a) The number of jobs provided by manufacturing firms remained the same but the jobs got distributed across the rich and poor countries.
- b) Advances in the manufacturing process put an end to routine labour and semi-skilled jobs in the rich world.
- c) While the complex jobs remained in the rich countries, all the semi-skilled jobs were relocated to the poor countries.
- d) While the routine jobs were relocated to the poor countries, the semi-skilled jobs in the rich world were eliminated by advances in the manufacturing process.

Q5. Which of the following enabled the shifting of routine labour to poor countries?

- a) Improvements in productivity.
- b) Politicians' focus on improving the productivity of the manufacturing sector.
- c) Advances in technology and manufacturing practices.
- d) Unionisation of the workers in the factories.

Q6. Which of the following aptly captures the relation between unions and politicians?

- a) In the late 20th century, many politicians were displeased with the strong influence of the unions but they now hope to get unionized jobs back.
- b) When the unions wielded power, many politicians supported them but when the unions became weak, they did not heed them.
- c) Many politicians are wary of bringing back the unionized jobs.
- d) Many politicians earlier disapproved of the influence of the unions but they now want the unionized jobs back.

DIRECTIONS for questions 7 to 9: The passage given below is followed by a set of three questions. Choose the best answer to each question.

Sartre thoroughly expounded his notion of the self-negation of freedom in *Being and Nothingness* (1943). Since the central feature of human existence is the capacity to choose in full awareness of one's own non-being, it follows that the basic question is always whether or not I will be true to myself. Self-deception invariably involves an attempt to evade responsibility for myself. If, for example, I attribute undesirable thoughts and actions to the influence upon me of the subconscious or unconscious, I have made part of myself into an "other" that I then suppose to control the real me. Thus, using psychological theory to distinguish between a "good I" and a "bad me" only serves to perpetuate my evasion of responsibility and its concomitants.

Sartre offered practical examples of "bad faith" in action. People who pretend to keep all options open while on a date by deliberately ignoring the sexual implications of their partners' behavior, for example, illustrate the perpetual tension between facticity and transcendence. Focussing exclusively on what-we-might-become is a handy (though self-deceptive) way of overlooking the truth about what-we-are. Similarly, servers who extravagantly "play at" performing their roles illustrate the tendency to embrace an externally-determined essence, an artificial expectation about what we ought-to-be.

The ability to accept ourselves for what we are – without exaggeration – is the key, since the chief value of human life is fidelity to ourselves, sincerity in the most profound sense. In our relationships with other human beings, what we truly are is all that counts, yet it is precisely here that we most often betray ourselves by trying to be whatever the other person expects us to be. This is invidious, in Sartre's view, since it exhibits a total lack of faith in ourselves: to the extent that I have faith in anyone else, I reveal my lack of the courage to be myself.

Q7. According to the passage, what does Sartre consider most objectionable?

- a) Displaying a total lack of faith in ourselves.
- b) Evading responsibility for oneself.

- c) Trying to fulfill other people's expectations of ourselves.
- d) Focussing exclusively on what one might become.

Q8. The given passage employs which of the following styles?

- a) Explanatory
- b) Analytical
- c) Argumentative
- d) Descriptive

Q9. Which of the following will conclude and complete the passage?

- a) But once again, of course, the cost is losing what we uniquely are in fact.
- b) There are, in the end, only two choices – sincerity or self-deception, to be or not to be.
- c) Human life demands total commitment to a path whose significance will always remain open to doubt.
- d) In Sartre's view, the inescapable condition of human life is the requirement of choosing something and accepting the responsibility for the consequences.

DIRECTIONS for questions 10 to 15: The passage given below is followed by a set of six questions. Choose the best answer to each question.

"Anyone can speak Troll. All you have to do is point and grunt." For years, psychologist Michael Corballis in his book *The Truth about Language* has been one of the chief proponents of the idea that language has its origins in gestures.

Language is considered the jewel in the crown of human superiority over other animals. It emerges out of nowhere in our evolutionary past, and no other animal's communication comes close to it. Through clicks, hoots, barks and bleats, some animals can inform each other of how they are feeling. And some, through gestures, can signal anger, impatience, dominance or submission, desire and attachment. But none can use these displays to convey a sentence like "I kicked the ball".

Being unique and powerful, human language is a siren to Darwinians, teasing us to examine how it arose, and from what. Corballis assigns a central role to the brain's mirror neurons, which seem to echo action in observation (in

monkeys, mirror neurons fire when they reach to grasp objects, and when they observe another animal doing the same). There is an overlap between parts of the mirror-neuron system and two areas in the brain's left cerebral cortex that are associated in humans with language production – Broca's and Wernicke's areas.

Mirror neurons have their detractors but for Corballis they raise the possibility that language “evolved within a system that, back in our monkey days, was specialised for grasping things”. In humans, mirror neurons also seem to be involved with other actions. One is pointing. Conveniently for Corballis, this is one of the earliest milestones of communication in children, emerging around the first year, and signifying the beginning of shared attention. ... And the fine control of facial muscles required for speaking seems to share cortical circuitry with regions that control gestures. Still, what is wrong with the view that our language grew from our hominid ancestors' capacity for vocalization? Charles Darwin thought that the capacity for complex vocal learning had deep evolutionary roots, extending at least as far back as our common ancestor with birds. Corballis counters that primate vocalizations, unlike gestures, seem barely under voluntary control. He contends that they emerge like nervous tics, more closely connected to expression of emotion than to a deliberate exchange of information. Vervet monkeys famously have three different alarm calls, corresponding to predatory eagles, leopards and snakes. But an alarm call does not involve the give and take of a language, gestural or otherwise. One suspects that many – such as the primatologist and ethologist Frans de Waal – will find Corballis' assessment of primate vocalizations harsh. But primatologists such as Jane Goodall and David Premack share his views. ... But what does it mean to say that language – the exchange of information between senders and receivers – arose from gestures? Gesturing may indicate a theory of mind, the ability to understand what others might know or be thinking; and surely that is a requisite for language. Humans take this understanding for granted, but it has proved difficult to show conclusively in other animals. Some dogs respond to pointing, but they have been selected to do so (and don't point things out to other dogs). Chimpanzees can point, but do it rarely: not what would be expected in routine social communication. Chimpanzees and other primates can follow others' gazes, but gazing is not an intentional act of communication. Indeed, following another's gaze is potentially an act of theft.

There the putative gestural trail goes cold in the long line of fossil hominins along the 6-million- to 7-million-year evolutionary path separating us from our common ancestor with chimpanzees. And yet this gap is where everything happened. Humans use language to promote learning, cooperation and the exchange of goods and services – a leap from occasional pointing. Our brand of sociality distinguishes our species as much as language does. It is hard to imagine our social systems working without language. ... And without the psychological capabilities that make

our advanced sociality possible, we might still be pointing and grunting like the Trolls.

Q10. The passage can be classified as

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

Q11. Which of the following choices correctly explains the relationship between the second and third paras?

- a) The second para indicates the uniqueness of human language and the third para identifies a possible cause.
- b) The third para provides an explanation about the conclusion of the second para.
- c) The third para contradicts the content of the second para.
- d) The second para provides evidence that supports the view that the author refutes. The third para is part of the explanation that is used to support the main conclusion of the author.

Q12. All of the following have been mentioned in the second para of the passage EXCEPT?

- a) Language sets a human apart from an animal.
- b) Animal gestures cannot convey certain messages like “I kicked the ball.”
- c) Gestures are not sufficient as a source of communication and hence languages are also required.
- d) Language is an instrument of action as much as a channel for the dispersal of information while gestures help to express feelings in a powerful way.

Q13. Which of the following choices correctly represents a feature or function of mirror neurons?

- a) Mirror neurons fire when animals observe their human friends doing the same action.
- b) There is an overlap between the mirror neuron system and two areas in the brain's right cerebral cortex in humans.
- c) In children, mirror neurons help in making gestures for indicating their moods and help in intertwining language with their experiences.

d) According to Corballis, mirror neurons are affiliated with language formulation in humans.

Q14. What does the author mean when he says “One suspects primate vocalisations harsh.” (para 6)?

- a) Frans de Waal agrees to disagree with Corballis.
- b) According to the author, Corballis’ analysis of Origins of Language is not acceptable.
- c) According to the author, Corballis’ assessment of communication in primates can be unacceptable to some primatologists.
- d) Corballis says that primate vocalization is not as efficient a source of communication as language and thereby can be considered harsh.

Q15. What is the conclusion of the seventh para of the passage?

- a) Although chimpanzees can follow others’ gazes, it can be considered an act of theft in a human environment.
- b) Gestures can surely be responsible for the origin of language but it has been difficult to show the same in case of animals.
- c) Dogs and chimpanzees can respond to pointing but they rarely do it.
- d) Gazing is not an intentional act of communication but language is.

DIRECTIONS for questions 16 to 18: The passage given below is followed by a set of three questions. Choose the best answer to each question.

Hackers, as a rule, love wordplay and are very conscious and inventive in their use of language. These traits seem to be common in young children, but the conformity-enforcing machine we are pleased to call an educational system bludgeons them out of most of us before adolescence. Thus, linguistic invention in most subcultures of the modern West is a halting and largely unconscious process. Hackers, by contrast, regard slang formation and use as a game to be played for conscious pleasure. Their inventions thus display an almost unique combination of the neotenous enjoyment of language-play with the discrimination of educated and powerful intelligence. Further, the electronic media which knit them together are fluid, ‘hot’ connections, well adapted to both the dissemination of new slang and the ruthless culling of weak and superannuated specimens. The results of this process give us perhaps a uniquely intense and accelerated view of linguistic evolution in action.

Hacker slang also challenges some common linguistic and anthropological assumptions. For example, in the early 1990s it became fashionable to speak of ‘low-context’ versus ‘high-context’ communication, and to classify cultures by the preferred context level of their languages and art forms. It is usually claimed that low-context communication (characterized by precision,

clarity, and completeness of self-contained utterances) is typical in cultures which value logic, objectivity, individualism, and competition; by contrast, high-context communication (elliptical, emotive, nuance-filled, multi-modal, heavily coded) is associated with cultures which value subjectivity, consensus, cooperation, and tradition. What then are we to make of hackerdom, which is themed around extremely low-context interaction with computers and exhibits primarily “low-context” values, but cultivates an almost absurdly high-context slang style?

The intensity and consciousness of hackish invention make a compilation of hacker slang a particularly effective window into the surrounding culture — and, in fact, this one is the latest version of an evolving compilation called the ‘Jargon File’, maintained by hackers themselves since the early 1970s. This one (like its ancestors) is primarily a lexicon, but also includes topic entries which collect background information on hacker culture that would be awkward to try to subsume under individual slang definitions.

Though the format is that of a reference volume, it is intended that the material be enjoyable to browse. Even a complete outsider should find at least a chuckle on nearly every page, and much that is amusingly thought-provoking. But it is also true that hackers use humorous wordplay to make strong, sometimes combative statements about what they feel. Some of these entries reflect the views of opposing sides in disputes that have been genuinely passionate; this is deliberate. We have not tried to moderate or pretty up these disputes; rather we have attempted to ensure that *everyone's* sacred cows get gored, impartially.

Q16. When compared to other Western subcultures, the hacker subculture

- a) was slow in disseminating new slang words but very quick in culling out weak and superannuated specimens.
- b) found it pleasurable to constantly invent new words and add them to their slang vocabulary.
- c) employed slang to suggest the breaking of the rules of social etiquette and the class system.
- d) invented language through a halting and largely unconscious process.

Q17. The last sentence of the passage “We have attempted to ensure that *everyone's* sacred cows get gored, impartially” suggests that

- a) the Jargon File keepers possessed an incredible ability to moderate disputes that cropped up from time to time.
- b) the use of amusingly thought-provoking and humorous wordplay is the name of the Jargon File keepers’ game.
- c) the Jargon File contains slang entries that will offend the sensibilities of almost all those whose jargon is being discussed.

d) the Jargon File usually contains slang that is nuance-filled, multi-modal and heavily coded but strong, combative statements made by hackers about how they feel also requires an intelligent play on words.

Q18. According to the passage, hackerdom is characterized by

- a) Low-context communication, low-context values and high-context slang style.
- b) High-context communication, high-context values and high-context slang style.
- c) Low-context communication, high-context values and high-context slang style.
- d) Low-context communication, high-context values and low-context slang style.

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.

The world's armed forces have adopted three-dimensional printing on demand on the front line. The military believes in the maxim "Amateurs talk strategy, but professionals talk logistics". Moving replacement parts through a long supply chain to a far-flung ship or base can take weeks and keeping a full range of spares near the front line is unrealistic. Far better to produce what is needed, when it is needed. Making what is needed to order has huge potential.

The *USS Harry S. Truman*, an American aircraft-carrier, took two 3D printers on her most recent tour. During the eight months she was at sea, her crew devised and printed items such as better funnels for oil cans, protective covers for light switches and also a cleverly shaped widget they dubbed the TruClip. This snaps onto walkie-talkies, reinforcing a connection that is otherwise prone to break in the rough-and-tumble of naval usage. TruClips alone have saved more than \$40,000 in replacement parts. The printers themselves, by contrast, cost about \$2,000 each. 3D printing will become an important part of the American navy's supply chains.

At the moment, only plastic items can be printed at sea. Landlubbing printers can make things out of metal by building up layers of metallic powder that are then melted with a laser or electron beam and allowed to cool into a solid. But printers, like people, get seasick. A ship's constant yawing, pitching and rolling disturbs the powder before the beam can do its work. This is why a printer of metal ship parts operated by Canada's navy sits safely on dry land, at the Cape Scott fleet-maintenance facility in Halifax, Nova Scotia.

In time, however, metal parts may also be printed at sea. The American navy is looking for ways to overcome the problem of instability. Mounting printers on damping platforms that hold them steady by compensating for a ship's

motion could be one answer. Another might be to form the metal “ink” into wires instead of powders, for wire is more easily held in place than a layer of dust is. In this arrangement the laser or electron beams would melt the tips of the wires. Nor are sailors the only servicemen who will benefit from 3D printing. China’s army prints both basic items, such as ratchets, and more sophisticated ones, including raised physical relief maps of local terrain that help soldiers plan operations more effectively than a paper map or screen display could. And America is advising the governments of Australia, Britain and France on 3D printing, in order to speed up these allies’ supply chains. . . .

The American navy will soon be supervising the distribution of 3D printers to American marines in Europe, the Middle East and the Pacific. In October marines at Camp Pendleton in California finished converting a shipping container into a rugged “expeditionary-manufacturing facility” movable by lorry, ship, train or aircraft. In addition to a 3D printer, this contains conventional machining equipment. Another such mobile workshop is under construction in North Carolina. And the army, too, is involved. It has already sent some 3D printers to bases in Afghanistan.

For now, like those on board ship, “forward deployed” printers of this sort make items out of plastic only. In their case the problem with printing in metal is not constant movement but grit – for this is a much more sensitive process than printing in plastic. Even that limitation will be overcome. The United States’ Army Research Laboratory is paying two firms to develop technologies which can turn blocks of metal into printable powder within the confines of a shipping container. The purpose of this is to recycle battlefield scrap into new equipment.

At the moment this “atomisation” process works like an old-fashioned shot tower. Molten metal poured in at the top of a chamber breaks into droplets that cool and solidify on their way down. But this requires a chamber at least six metres high, which is too tall to fit upright inside a standard shipping container. MolyWorks Materials of Los Gatos, California, has managed to shrink the process so that it does fit inside such a container. It does so by orienting the chamber diagonally, and employing jets of inert gas to stop the droplets touching the sides before they have cooled. If printers that make use of these solidified droplets can also be made rugged enough to withstand the battlefield, then broken parts themselves will become recyclable, supply chains may no longer need to deliver even raw materials. **More thought can then be given to the little matter of strategy.**

Q19. Which of the following idioms or proverbs can be best associated with the theme of the passage as a whole?

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. Watch paint dry.
2. Make hay while the sun shines.
3. Keep your powder dry.
4. For want of a nail the kingdom was lost.
5. To whip something up.

Q20. According to the third para of the passage, what is currently deterring the 3D printer from using metal as its raw material?

- a) 3D printers that work excellently on land are non-functional in the seas.
- b) Cooling of the molten metallic powder used to print metallic items becomes difficult in the sea.
- c) The constant movement of the printer due to the ship's movement misaligns the laser or electron beam and prevents it from cooling the molten metallic powder.
- d) The ship's motion on the sea interferes with the normal arrangement of the metallic powder thereby preventing the laser or electron beam from melting it.

Q21. Which of the following can be a reason that 3D printed raised relief maps of local terrain are more effective than screen displays as indicated in the passage?

- a) Unlike the latter, the three dimensional maps pull out the most important topographical features and throw away a huge amount of much less valuable information.
- b) The raised relief maps, being three dimensional, are visually realistic and depict proportional topographical detail such as the height of mountains, the width of lakes etc, and so operations can be planned more efficaciously.
- c) Even though the former are accurate only at a certain level of abstraction, they are invaluable in the hands of an experienced user who knows their limitations.
- d) Unlike the latter, the three dimensional maps offer an exact replica, on exactly the same scale, of the place where the army is, and are more artistically designed, leading to better strategies and army operations.

Q22. According to the passage, how will forward deployed printers successfully deal with the problem of printing in metal?

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. Mounting printers on damping platforms.
2. Converting the metal 'ink' into metallic wires instead of metallic powders.
3. Turning blocks of metals into printable powder within the confines of a shipping container.
4. Using the existing shot tower 'atomisation' process to convert molten metal into solidified droplets.
5. Melting battlefield metal-scrap with a laser beam.

Q23. All of the following cannot be understood from the passage EXCEPT?

- a) The author mentions the *USS Harry S. Truman* in the passage to point out how having access to a 3D printer can encourage innovation and can lead to savings for the American navy's supply chain.
- b) Forward deployed printers are rugged enough to withstand the battlefield environment and to handle all materials, and American marines are using them in movable facilities which are especially sent to foreign locations during operations.
- c) In the sentence, "the problem with printing in metal is not constant movement but grit." (penultimate para), "grit" refers to non-crucial components which interfere with the printing process.
- d) Moly Works Material of Los Galos has shrunk the size of the shipping container so that the printable metal powder can be confined and properly stored in it.

Q24. Which of the following choices best describes the role of the boldfaced part of the passage?

- a) It presents the author's cynical view as far as the current limitations of 3D printing are concerned.
- b) It is a tongue-in-cheek statement and serves as a counter-argument to the second sentence of the first paragraph.
- c) It reiterates the fact that logistics is very important even at the cost of strategy, while praising the fact that 3D printing can always help reshoe a horse.
- d) It employs mild humour to suggest that once the logistics are taken care of, time can be devoted to strategy.

Q25. DIRECTIONS for questions 25 to 28: 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. Take the kerfuffle over a plan for a swanky new centre in Stockholm, the Nobel Center or *Noblehuset*.

2. Yet his countrymen appear reluctant to promote him.
3. Rather, it is more a question of indifference to history.
4. And this is not because they think it outrageous that Leo Tolstoy and Mark Twain never won the Nobel Prize for literature but Eyvind Johnson and Harry Martinson (who just happened to sit on the Nobel panel) did.
5. Few Swedes have been as influential as the bearded chemist and inventor of dynamite, Alfred Nobel.

Q26. DIRECTIONS *for questions 25 to 28:* 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. That left archaeologists with a cruel dilemma: attempt to read their discoveries, which would destroy them, or preserve them as found, but remain ignorant of what they said.
2. They were, indeed, so damaged that any attempt to handle them simply made things worse.
3. In 1970 archaeologists digging at Ein Gedi, dug up the ark of a synagogue that had stood on the site from about 800BC until it was destroyed by fire in around 600AD.
4. The result was worth the effort.
5. Within was a trove of scrolls but sadly, though the ark had protected them from the worst of the blaze, they were badly scorched.

Q27. DIRECTIONS *for questions 25 to 28:* 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. But when the researchers pressed for the definition of “intelligence,” they received an interesting answer.
2. The world is full of people who are acting stupidly everyday, and they are not even aware of what a negative effect this is having on their lives.
3. Rather, intelligence was most commonly defined as a “way of acting.”
4. In Gallup interviews of thousands of men and women to determine the root causes of success in life and work, the importance of “intelligence” was mentioned again and again.

5. Intelligence was not defined as IQ or grades in school.

Q28. DIRECTIONS *for questions 25 to 28:* 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. It was an editorial which his secretary had marked with an angry splash in red pencil.
2. He had to read it: there had been too much talk about this issue in the last three months, ominously too much.
3. A battle against a thing such as that bill seemed preposterous and faintly embarrassing to him, as if he were suddenly asked to compete with a man who calculated steel mixtures by the formulae of numerology.
4. It was entitled "Equalization of Opportunity."
5. A newspaper clipping fluttered down to the floor.

Q29. DIRECTIONS *for questions 29 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4 or 5). Decide on the proper order for the sentences and key in the correct sequence as your answer in the input box given below the question.

1. Perhaps that is one reason why they regularly figure in opinion polls as among the world's happiest people.
2. Latin Americans save much less than the experts think they ought to.
3. Latin Americans are well known for their love of the fiesta and, when they can afford it, their conspicuous consumption.
4. Compared with residents of developed countries, and especially those of emerging Asia, Latin Americans stand out for their lack of thrift.
5. Yet economists frown when Latin American households – and governments – spend with little regard for tomorrow.

Q30. DIRECTIONS *for questions 29 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4 or 5). Decide on the proper order for the

sentences and key in the correct sequence as your answer in the input box given below the question.

1. Business theorists routinely instruct managers to look over the horizon.
2. In it, W. Chan Kim and Renee Mauborgne of INSEAD, a business school in France, argue that companies should trawl for profits in “blue oceans” that their rivals ignore rather than “red oceans” that they squabble over.
3. But reinventing a business from the ground up, to avoid being consumed by the fires of new technology, comes with huge risks as well as a potential for great rewards.
4. And “Blue Ocean Strategy” is the most successful book on business master-planning in recent years.
5. Companies often search for ways to break new ground lest a rival or new entrant does the same and pulls the rug from beneath them.

Q31. DIRECTIONS *for questions 29 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4 or 5). Decide on the proper order for the sentences and key in the correct sequence as your answer in the input box given below the question.

1. Stephen King, a horror novelist, in an entertaining rant against the passive in his autobiography, refers to it several times as the “passive tense” but it isn’t a tense.
2. In the typical active sentence, the subject is the doer of the action: he kicked the ball.
3. This is because tense has to do with when things happen in time. Voice structures who did what to whom in a sentence.
4. But, in the typical passive sentence, the recipient of action becomes the subject: the ball was kicked.
5. But critics of the passive voice often go wrong.

Q32. DIRECTIONS *for questions 29 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4 or 5). Decide on the proper order for the sentences and key in the correct sequence as your answer in the input box given below the question.

1. The flipside of this lending by the households was a parallel imbalance in trade.

2. Europe's economic crisis was a stew with many ingredients, from spendthrift governments to inadequate safeguards in the banking system.
3. The stock in which it all simmered, however, consisted of big imbalances in trade and capital flows resulting from economic integration.
4. This was because peripheral economies consumed more goods and services than they could produce themselves.
5. Economic integration encouraged high-saving households in slow-growing northern economies to ship their money to the periphery, where potential returns were higher.

Q33. DIRECTIONS for questions 33 and 34: Given below is a paragraph with three blanks. For each blank choose one numbered word/ phrase from the corresponding column of choices that will best complete the text. Key in the appropriate numbers of the words/ phrases for each blank, in the correct sequential order, in the input box given below the question. For example, if you think that words/ phrases labelled (1), (5) and (9) can complete the text correctly, then enter 159 as your answer in the input box. (Note: Only one word/ phrase in each column can fill the respective blank correctly)

The French have an expression, *l'appel du vide* ("the call of the void"), to refer to the compulsive urge to do something self-destructive, such as the leap off a cliff. It captures the _____ (i) _____ felt in contemplating the act, but resisting it. President Francois Hollande, however, seems to have surrendered. In a 662-page book published last month by two journalists, based on recorded interviews with the Socialist president, Mr. Hollande insults _____ (ii) _____ : judges, footballers, his own ministers and more. That a leader seeking re-election could engage in such a/ an _____ (iii) _____, six months before France's presidential election, has left his allies dumbstruck and his political future in freefall.

Blank (i)	Blank (ii)	Blank (iii)
(1) hilarity and hauteur	(4) all and sundry	(7) unctuous and jejune venture
(2) the frisson, the exuberance	(5) authoritarianism	(8) politically suicidal exercise
(3) rapprochement	(6) the recreant and oppugnant citizenry	(9) seemingly insatiable purge

Q34. DIRECTIONS for questions 33 and 34: Given below is a paragraph with three blanks. For each blank choose one numbered word/ phrase from the corresponding column of choices that will best complete the text. Key in the appropriate numbers of the words/ phrases for each blank, in the correct sequential order, in the input box given below the question. For example, if you think that words/ phrases labelled (1), (5) and (9) can complete the text correctly, then enter 159 as your answer in the input box. (Note: Only one word/ phrase in each column can fill the respective blank correctly)

If a prize were to be awarded for the world's _____(i)_____ prose, the paragraphs of indecipherable text that make up "terms of use" agreements would surely win. These legal thickets are designed to protect companies from litigious online shoppers and users of web services. Some firms require agreement, as when users are asked to click a box before creating an Apple ID. Other sites explain their policies without seeking customers' _____(ii)_____ consent. Few consumers read these terms, let alone understand them. Because they involve no negotiation between customer and company, firms often insert language conferring broad protections to lower their risk of liability. But, _____(iii)_____, legal disclaimers designed to limit lawsuits are now unleashing litigation.

Blank (i)	Blank (ii)	Blank (iii)
(1) stultifying	(4) expedient	(7) in a new twist
(2) dissembled	(5) flagitious	(8) unencumbered, contradistinct
(3) clunkiest	(6) explicit	(9) unfortunately

DILR

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

Eric uses a software for storing the passwords for all his accounts. Eric's passwords for any of his accounts comprise only alphabets. After he enters any password into the software, the software encrypts the password and displays only the encrypted password to anyone who accesses it. Any password that is entered in the software is encrypted in the following manner:

1. Each alphabet from A to Z is assigned a number from 1 to 26 respectively.
 2. Each letter in the password, from left to right, is assigned a number according to the above rule.
 3. In any password, only if any vowel is immediately followed by a consonant, the number assigned to the vowel is increased by 1. Otherwise, the number assigned to the vowel remains the same.
- The software displays the passwords only as a string of the numbers assigned to each letter of the password based on the above rules.

Q1. DIRECTIONS *for questions 1 to 4:* Select the correct alternative from the given choices.

What will be the encrypted password that the software displays for a password entered as 'BADAEN'?

- a) 2241614
- b) 2241514
- c) 2141514
- d) 2141614

Q2. DIRECTIONS *for questions 1 to 4:* Select the correct alternative from the given choices.

If the software displayed an encrypted password for an account as '2156416', which of the following can be the password of that account?

- a) BAEFDAE
- b) UEEDAF
- c) UEEDP
- d) More than one of the above

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

Eric's friend, Jack, who was not aware of any of Eric's passwords, used the software to retrieve an encrypted password for one of Eric's accounts. If Jack was able to work out the correct password from the encrypted password, using only the rules of encryption mentioned above, which of the following could have been the encrypted password for that account?

- a) 1561617
- b) 16516139
- c) 16521135
- d) More than one of the above

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

Which of the following sequence of numbers can never be one of the encrypted passwords?

- a) 21123
- b) 151819
- c) 159612
- d) 22115

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

The table below provides the number of subscribers (in '000) of a magazine from four different states – AP, UP, MP and HP – at the beginning of five months, from January to May, of a particular year. The difference between the number of subscribers at the beginning of a month and that at the beginning of the previous month is the number of new subscribers who subscribed to the magazine during the previous month.

State	Month				
	January	February	March	April	May
AP	180	195	215	217	230
UP	250	255	268	279	291
MP	84	102	119	131	148
HP	109	117	133	154	161

Note: No person unsubscribed from the magazine during the given five months.

Q5. DIRECTIONS for questions 5 to 7: Select the correct alternative from the given choices.

In which of the following months was the total number of new subscribers who subscribed to the magazine across the four states the highest?

- a) January
- b) February
- c) March
- d) April

Q6. DIRECTIONS for questions 5 to 7: Select the correct alternative from the given choices.

What was the highest percentage increase in the number of new subscribers who subscribed to the magazine from any state in any month as compared to that in the previous month?

- a) 160%
- b) 100%
- c) 650%
- d) 550%

Q7. DIRECTIONS for questions 5 to 7: Select the correct alternative from the given choices.

In how many months from January to April was the number of new subscribers from MP greater than that from HP?

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

Q8. DIRECTIONS for question 8: Type in your answer in the input box provided below the question.

If each subscriber paid Rs.200 per month towards subscription charges, the maximum total subscription charges (in Rs.) earned from the new subscribers from any state in any month were

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

Axolex manufactures a chemical called PTS using two raw materials – ASB and KME. For manufacturing one kg of PTS, 440 gm of ASB and 270 gm of KME are required. The manufacturing of PTS happens only in batches of 1 kg and manufacturing of any batch of PTS can begin only if the quantities of raw materials available are sufficient to manufacture one kg of PTS. Further, only when there is a shortfall in any raw material, because of which it is not possible to manufacture the subsequent batch of PTS, is that raw material purchased.

Given below is a page from the journal of the production manager of Axolex, in which he wrote down, on a daily basis, the details regarding the number of batches of PTS manufactured on each day and the type and quantity of raw materials purchased, if any. The entries in the journal on any day were made in the chronological order, i.e., for example, on 4th January, 2017, five batches of PTS were manufactured after which 4 kg of KME was purchased. Each batch of PTS manufactured in the month of January was numbered consecutively starting from 1.

01/01/2017	- Manufactured 7 batches of PTS
02/01/2017	- Manufactured 8 batches of PTS
03/01/2017	- Manufactured 5 batches of PTS - Purchased 5 kg of ASB
04/01/2017	- Manufactured 5 batches of PTS - Purchased 4 kg of KME
05/01/2017	- Manufactured 7 batches of PTS - Purchased 6 kg of ASB
06/01/2017	- Manufactured 7 batches of PTS - Purchased 3 kg of KME
07/01/2017	- Manufactured 6 batches of PTS - Purchased 8 kg of ASB
08/01/2017	- Manufactured 6 batches of PTS - Purchased 4 kg of KME
09/01/2017	- Manufactured 7 batches of PTS
10/01/2017	- Manufactured 6 batches of PTS - Purchased 3 kg of ASB

Q9. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices.

Which of the following can be amount of ASB available before the first batch was manufactured?

- a) 8.91 kg
- b) 9.12 kg
- c) 9.18 kg
- d) 9.26 kg

Q10. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices.

What is the minimum total amount of ASB and KME put together that could have been available before the first batch was manufactured?

- a) 14.78 kg
- b) 15.93 kg
- c) 15.55 kg
- d) 16.12 kg

Q11. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices.

Which of the following can be the total quantity of ABS and KME combined after exactly 38 batches are manufactured?

- a) 3.89 kg
- b) 3.93 kg
- c) 4.06 kg
- d) 4 kg

Q12. DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices.

If the immediately next entry in the journal reads “Manufactured n batches of PTS”, what is the maximum possible value of n ?

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

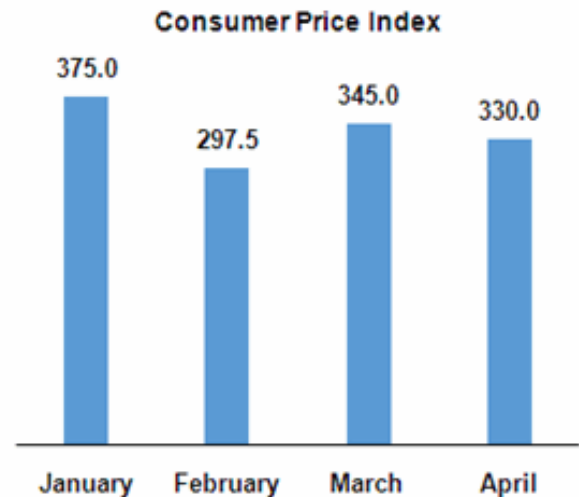
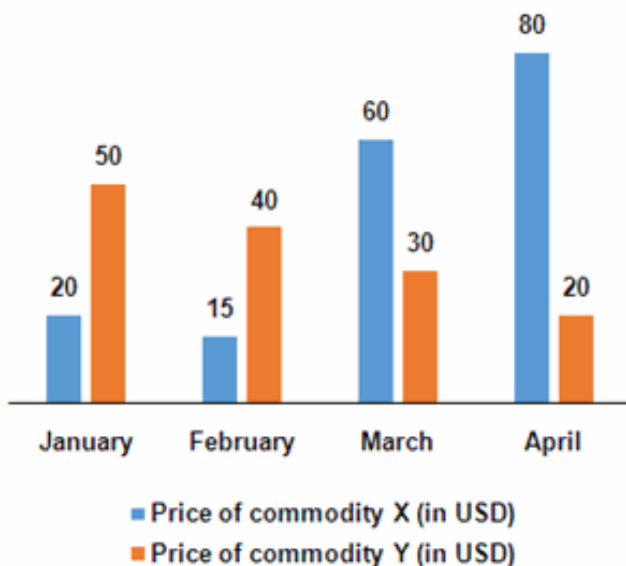
DIRECTIONS for questions 13 to 16: Answer these questions on the basis of the information given below.

In a country, the Consumer Price Index (CPI) is calculated for each month at the beginning of that month on the basis of the prices of two commodities – X and Y. If P_X and P_Y are the prices (in USD) of the commodities X and Y, the Consumer Price Index (CPI) is calculated using the formula

$$\text{CPI} = a \times P_X + b \times P_Y$$

where a and b are the weightages for commodities X and Y respectively and remain constant every month.

The first graph below shows the prices of commodity X and Y at the beginning of each of four months, January to April, and the second graph shows the CPI for each of the four months.



Q13. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.

If the CPI for May is the same as that for March and the price of commodity X was 20% less than that of commodity Y, what is the price (in USD) of commodity X at the beginning of May?

- a) 31.49
- b) 32.47
- c) 40.59
- d) 39.75

Q14. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.

If, at the beginning of a particular month, the prices of commodities X and Y increased by 30% and 40% respectively as compared to the previous month, what will be the percentage increase in the CPI for that month as compared to that for the previous month?

- a) 32%
- b) 35%
- c) 37%
- d) Cannot be determined

Q15. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.

If the CPI for the month of May was 396 and the price of commodity X at the beginning of May was the same as that of commodity Y, what is the percentage increase (or decrease) in the price of commodity Y in May as compared to that in April?

- a) 100%
- b) 120%
- c) 140%
- d) 160%

Q16. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.

If, starting from April, the price of commodity Y increased by not more than 5% every month and the price of commodity X increased by not less than $x\%$ every month, and the CPI for June was not less than 350, what is the minimum possible value of x ?

- a) 1.655
- b) 2.147
- c) 1.135
- d) 2.687

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

Nine persons – A through I – attended a conference and were seated around a circular table in nine equally spaced chairs. The nine persons arrived at the conference at different times and except for the first person to arrive, each of the other eight persons sat five places to the left of the person who arrived immediately before him. Further, each of the nine persons were seated around the table as soon as they arrived at the conference. The following information is known about the positions of the nine persons around the table and the order in which they arrived:

1. The person who arrived first was sitting two places away from B, while E, who arrived before H, was not sitting adjacent to H.
2. C, who arrived before I, was not sitting adjacent to H, while A was not the last to arrive.
3. H, who arrived after D, was sitting two places to right of D.
4. The number of persons sitting from G to I in the anticlockwise direction was the same as the number of persons who arrived after G and before I.
5. H was not the last to arrive, while D was not the second to arrive.
6. G was not the first to arrive, while at most five persons arrived before I.

Q17. DIRECTIONS for questions 17 and 18: Type in your answer in the input box provided below the question.

How many persons arrived before C arrived?

Q18. DIRECTIONS for questions 17 and 18: Type in your answer in the input box provided below the question.

How many seats were empty immediately before H arrived at the conference?

Q19. DIRECTIONS for questions 19 and 20: Select the correct alternative from the given choices.

Who among the following was sitting in a chair adjacent to the one in which D sat at the time he arrived?

- a) I
- b) **G**
- c) **A**
- d) None of them

Q20. DIRECTIONS for questions 19 and 20: Select the correct alternative from the given choices.

Who among the following was sitting adjacent to the person who was the second to arrive?

- a) **G**
- b) **E**
- c) **A**
- d) **C**

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

Seven persons, Ankit, Balu, Charu, Dinesh, Farhan, Giri and Harsh, work in an office and each person does not go to the office on different days of the week. One of the seven persons does not go on Mondays, Tuesdays and Wednesdays; another one does not go on Tuesdays, Thursdays and Saturdays; another one does not go on Saturdays and Sundays; another one does not go on Tuesdays and Sundays; another one does not go on Fridays and Saturdays; another one does not go on Mondays, Fridays and Saturdays; and another one does not go on Thursdays.

It is also known that

1. in any week, the number of days that both Balu and Charu go to the office is 4.

2. in any week, the number of days that at least one among Farhan and Harsh go to the office is 5.
3. Ankit goes to the office on all the days that Dinesh goes to the office.
4. in any week, both Harsh and Charu go to the office on at least four days.

Q21. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.

On how many days of the week does Giri go to the office?

- a) 6
- b) 5
- c) 4
- d) Cannot be determined

Q22. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.

On which of the following days do both Balu and Farhan not go to the office?

- a) Tuesday
- b) Saturday
- c) Thursday
- d) None of the above

Q23. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.

Which of the following pairs of persons both go to the office on at least four days in a week?

- a) Dinesh, Charu
- b) Dinesh, Farhan
- c) Ankit, Balu
- d) Ankit, Farhan

Q24. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.

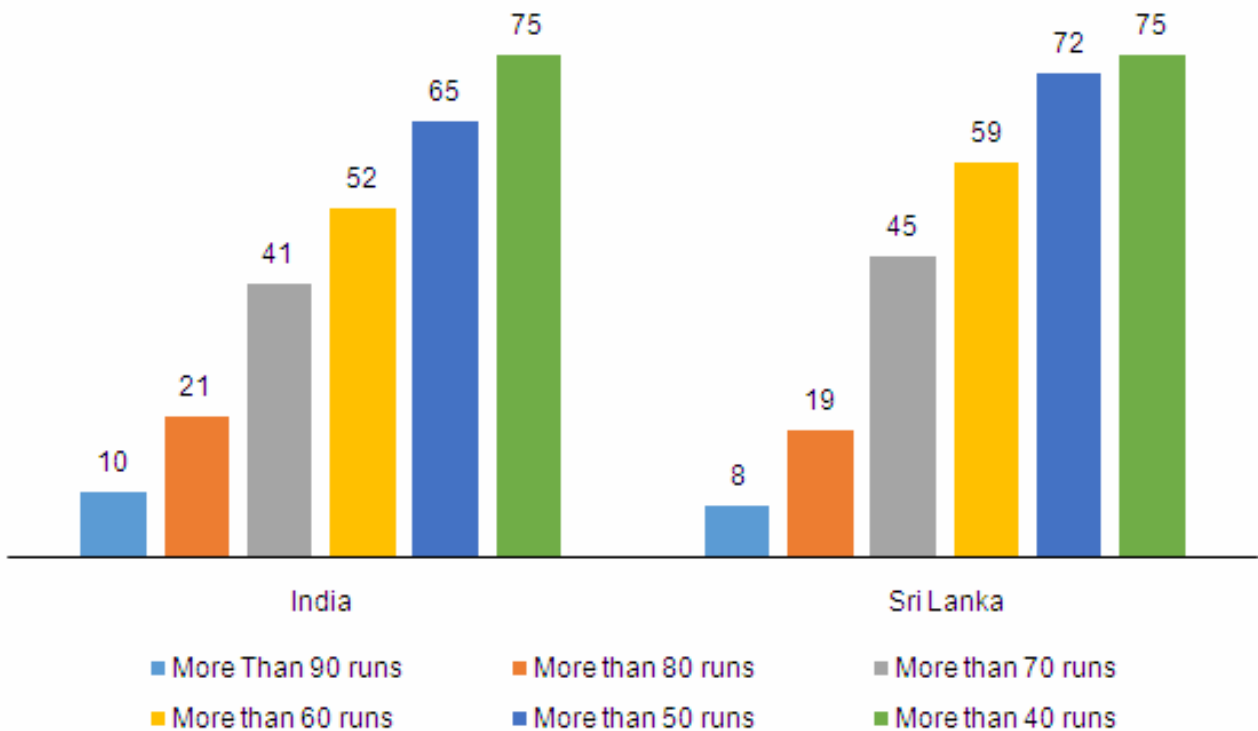
On which of the following days do at least two among Farhan, Giri and Dinesh go to the office?

- a) Monday

- b) Thursday
c) Saturday
d) More than one of the above

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

During his career, Hanu, a cricketer, played in only two different countries – India and Sri Lanka. The following bar graph provides the number of innings in which he scored more than a certain number of runs in each country and the table below it provides the minimum and maximum number of runs that he scored in any innings in each of the two countries:



Country	Minimum	Maximum
India	42	96
Sri Lanka	48	94

Note: The average runs scored by Hanu in any country is the total number of runs that he scored in that country divided by the total number of innings that he played in that country.

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

How many of the following values can be the average runs scored by Hanu in India?

- (i) 70.55
- (ii) 66.35
- (iii) 63.5
- (iv) 60.65
- (v) 74.6

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

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

If x is the average runs scored by Hanu in Sri Lanka, what is the difference between the maximum possible value of x and the minimum possible value of x ?

- a) $7\frac{1}{75}$
- b) $8\frac{1}{25}$
- c) $8\frac{1}{75}$
- d) $7\frac{1}{25}$

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

The average runs scored by Hanu in both the countries combined is 68. If every time Hanu scored at least 61 runs and at most 70 runs in both the countries, he always scored exactly x runs, what is the maximum possible value of x ?

- a) 66
- b) 65
- c) 64
- d) 63

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

In one of the two countries, everytime Hanu scored more than 90 runs, he always scored the same number of runs. If the average number of runs scored by Hanu in this country was 68, what is the highest possible average runs scored by Hanu in those innings in this country in which he scored at least 81 runs and at most 90 runs?

- a) $85\frac{8}{11}$
 b) $84\frac{3}{11}$
 c) $86\frac{5}{11}$
 d) $87\frac{9}{11}$

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

Anne, Mary and John are three household helps, each of who works for exactly two families – the Smiths and the Jones. Each family pays a monthly salary to each of the three persons. The monthly salary (in Rs.) that each family pays to any person is a positive integral multiple of 100.

The following information is known about the salary of the three persons:

1. The total salary that the Smiths pay to the three persons each month is Rs.3000.
2. For each person, the salary that he/she receives from one of the two families is four times that from the other.
3. The total salary that Mary receives from the two families is half the salary that Anne receives from the Jones.
4. The salary that John receives from the Jones is not greater than Rs.300.

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

What is the total monthly salary (in Rs.) that the Jones pay to the three persons?

Q30. DIRECTIONS for question 30: Select the correct alternative from the given choices.

How many of the three persons receive a higher monthly salary from the Jones as compared to that they receive from the Smiths?

- a) 0
 b) 1
 c) 2

d) 3

Q31. DIRECTIONS for questions 31 and 32: Type in your answer in the input box provided below the question.

What is the monthly salary (in Rs.) that Mary receives from the Smiths?

Q32. DIRECTIONS for questions 31 and 32: Type in your answer in the input box provided below the question.

What is the ratio of the total monthly salary of John to that of Anne?

QA

Q1. DIRECTIONS for questions 1 to 3: Select the correct alternative from the given choices.

If the monthly income of Gerrard increased by 30%, while his expenditure remained the same and his savings increased by 120%, then his monthly expenditure is approximately what percentage of his new income?

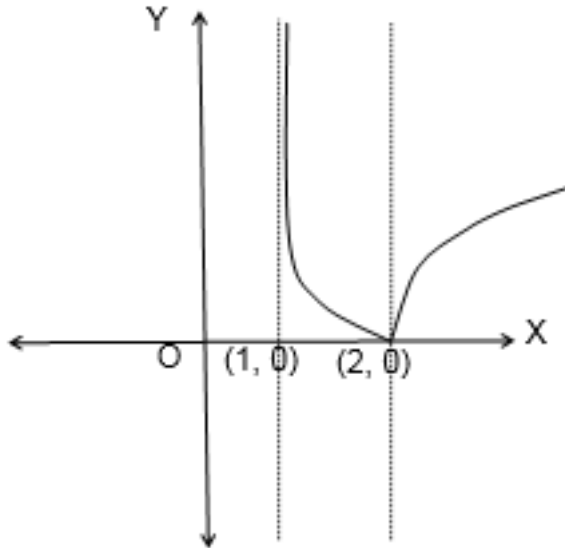
- a) 54.9%
- b) 57.7%
- c) 60.3%
- d) 62.1%

Q2. DIRECTIONS for questions 1 to 3: Select the correct alternative from the given choices.

Find the equation whose roots are three times the reciprocals of the roots of $4x^2 - 15x + 12 = 0$.

- a) $4x^2 - 15x + 9 = 0$
- b) $108x^2 - 45x + 4 = 0$
- c) $12x^2 - 15x + 4 = 0$
- d) $4x^2 - 15x + 12 = 0$

Q3. DIRECTIONS for questions 1 to 3: Select the correct alternative from the given choices.



Select the relation that best describes the graph given above.

- a) $y = | \log_2(x+1) |$
- b) $y = | \frac{x-2}{x-1} |$
- c) $y = | \log_2(x-2) |$
- d) $y = | \log_{0.5}(x-1) |$

Q4. DIRECTIONS for question 4: Type in your answer in the input box provided below the question.

For $x > 0$, what is the minimum value of $\frac{(x+4)(10+x)}{x+2}$?

Q5. DIRECTIONS for questions 5 to 7: Select the correct alternative from the given choices.

A man is five times as old as his son. If the man was 32 years old when his son was born, find the age of the son when the man was nine times as old as the son?

- a) 2 years
- b) 4 years
- c) 6 years
- d) 16 years

Q6. DIRECTIONS for questions 5 to 7: Select the correct alternative from the given choices.

If a regular polygon has 44 diagonals, find the measure of each interior angle of the polygon.

a) 144°

b) $147\frac{3}{11}^\circ$

c) 150°

d) 140°

Q7. DIRECTIONS for questions 5 to 7: Select the correct alternative from the given choices.

If $f(x) = \frac{4x^2 - 5}{4x^2 + 2}$, then the minimum value of $f(x)$ is

a) $-\frac{5}{2}$

b) -3.

c) $-\frac{7}{2}$

d) None of the above

Q8. DIRECTIONS for question 8: Type in your answer in the input box provided below the question.

If $f(x + y) = f(x) + f(y)$ and $f(4) = 16$, then $f(15) =$

Q9. DIRECTIONS for question 9: Select the correct alternative from the given choices.

What is the domain of the function $F(x) = \log_{(x^2)} |2x^2 - 17x + 33|$?

a) $\mathbb{R} - \left\{3, \frac{11}{2}\right\}$

b) $\mathbb{R} - \left\{-1, 1, 3, \frac{11}{2}\right\}$

c) $\mathbb{R} - \left\{-1, 0, 1, 3, \frac{11}{2}\right\}$

d) None of the above

DIRECTIONS for questions 10 and 11: Answer the questions on the basis of the information given below.

When travelling at a certain speed, the consumption of petrol, in litres/km, by a vehicle increases by 20% during uphill journey and decreases by 50% during downhill journey, both when compared to a normal journey, i.e., on level surface and at the same speed. Two hill stations, A and B, are separated by a distance of 800 km, and the distance for which the road from A to B runs uphill is one-fourth of the distance for which it runs downhill. Further, the distance for which the road runs on level surface is 300 km. For a round trip from A to B and back, the vehicle consumed 145 litres of petrol. Assume that the vehicle always travels at the same speed.

Q10. DIRECTIONS for questions 10 and 11: Type in your answer in the input box provided below the question.

What is the mileage (in km/litre) given by the vehicle for the downhill journey?

Q11. DIRECTIONS for questions 10 and 11: Type in your answer in the input box provided below the question.

What is the quantity (in litres) of petrol consumed for the return journey from B to A?

Q12. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

Amar borrowed Rs.15,000 each from two banks, RIB and SIB. RIB charged a 20% rate of interest, compounded annually, while SIB charged an equal rate of interest but compounded semi-annually. If Amar repaid the both the loans in full, each in a single payment, two years after he borrowed the money, what is the ratio of the amount repaid by Amar to RIB to that repaid to SIB?

- a) 14400:14641
- b) 100:121
- c) 12100:14400
- d) 16000:17600

Q13. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

If the angles of elevation of the top of a tower as observed from the top and the foot of a pole, of height 30 m, are 30° and 60° respectively, then the height of the tower is

- a) 45 m.
- b) $30\sqrt{3}$ m.
- c) 60 m.
- d) $60\sqrt{3}$ m.

Q14. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

If the reflection of a point (3, 4) in a line l represented by the equation $x - ky = 16$ is (5, -8), what is the foot of the perpendicular drawn from (3, 4) to the line l ?

- a) (2, 4)
- b) (4, -3)
- c) (4, -2)
- d) (4, 2)

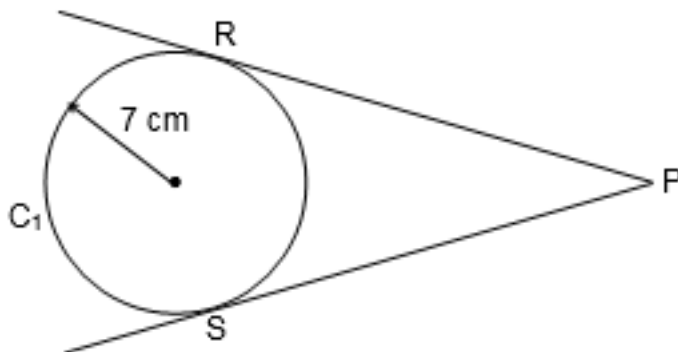
Q15. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

If $\log_a 15 = x$, $\log_a 45 = y$ and $\log_a 75 = z$, which of the following would be equal to $\log_a 10125$.

- a) $\frac{2x + 4y + 2z}{3}$
- b) $\frac{3}{2x + 4y + 4z}$
- c) $\frac{3}{3x + 4y + z}$
- d) $\frac{3}{3x + 2y + z}$

Q16. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

In the figure given below, PR and PS are tangents drawn to circle C_1 , whose radius is equal to 7 cm. If the length of PS is 24 cm, find the area (in sq cm.) of the triangle PRS.



- a) $\frac{96768}{625}$

93524

b)
$$\begin{array}{r} 625 \\ 98756 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 625 \\ 97867 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 625 \\ \hline \end{array}$$

Q17. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

Find the arithmetic mean of the first 27 terms of an arithmetic progression in which the first term is 4 and the common difference 3.

- a) 43
- b) 41
- c) 40
- d) 38

Q18. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

In a set of five distinct positive integers, 1, 3, 8, 12 and x , for how many values of x will the mean of the set be greater than or equal to the median of the set?

- a) 3
- b) 4
- c) 2
- d) More than 4

Q19. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

Find the number of solutions of the equation $||x + 3| - x| = 4$.

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

Q20. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

The ratio of the present ages of A and B is 3 : 7, whereas after n years it will be 1 : 2. Find the difference between their ages after $2n$ years, if the ratio of their ages 15 years ago was 1 : 4.

- a) 20 years
- b) 24 years
- c) 36 years
- d) 48 years

Q21. DIRECTIONS for questions 12 to 21: Select the correct alternative from the given choices.

Each of three friends, Akbar, Bob and Chand, wants to book an examination slot for attempting the CAT exam, which will be held across three consecutive days, with each day having two slots, one in the morning and the other in the afternoon. The three of them want to book the slots such that the following conditions are satisfied:

- (i) No two friends can attempt the examination in the same slot.
 - (ii) A has to attempt the examination before B.
 - (iii) B and C cannot attempt the examination on the same day.
 - (iv) A and C cannot attempt the examination on consecutive days.
- In how many ways can the three of them book the slots?

- a) 14
- b) 20
- c) 24
- d) 18

Q22. DIRECTIONS for question 22: Type in your answer in the input box provided below the question.

Two functions $F(x)$ and $G(x)$ are defined as follows:

$$F(x) = x^2 + 12x - 6$$

$$G(x) = 3x - 6 - x^2$$

If $H(x) = \text{Maximum}(F(x), G(x))$, for what value of x would $H(x)$ assume its minimum value?

Q23. DIRECTIONS for questions 23 to 27: Select the correct alternative from the given choices.

Paykwik, a mobile wallet company offers a discount on movie tickets booked using its application. The company offers a 40% discount on the ticket price or a Rs.150 discount, whichever is less on each ticket purchased through its application. On a certain day, if Virat purchased three tickets worth Rs.330, Rs.370 and Rs.430 through the application, what is the approximate overall percentage of discount that Virat would get on the three transactions combined?

- a) 37.85%

- b) 37.95%
- c) 38.15%
- d) 38.05%

Q24. DIRECTIONS for questions 23 to 27: Select the correct alternative from the given choices.

If $\frac{x}{112} = \frac{343}{\sqrt[3]{x}}$, find the value of $x^{\frac{2}{3}}$.

- a) **98**
- b) 196
- c) **112**
- d) **156**

Q25. DIRECTIONS for questions 23 to 27: Select the correct alternative from the given choices.

On purchasing fruits from a market, Piku observed that 3 apples cost as much as 10 bananas, 8 mangoes cost as much as 3 pineapples and 5 bananas cost as much as 4 mangoes. Purchasing which of the following combinations of fruits would cost Piku the most?

- a) 4 apples, 10 bananas, 8 mangoes, 3 pineapples
- b) 8 apples, 4 bananas, 5 mangoes, 6 pineapples
- c) 6 apples, 5 bananas, 6 mangoes, 4 pineapples
- d) 7 apples, 8 bananas, 4 mangoes, 5 pineapples

Q26. DIRECTIONS for questions 23 to 27: Select the correct alternative from the given choices.

Find the standard deviation of the set of numbers 5, 5, 5, 8, 8, 7, 9 and 9.

- a) $\frac{\sqrt{40}}{3}$
- b) $\frac{\sqrt{14}}{3}$
- c) $\frac{5}{2}$
- d) $\frac{\sqrt{11}}{2}$

Q27. DIRECTIONS for questions 23 to 27: Select the correct alternative from the given choices.

Preeti found that for every set of non-zero real values P , Q and R , chosen such that $3(P + Q) = 2(R - Q)$, the equation $Rx + Qy + P = 0$ represents a straight line in the co-ordinate plane.

If she further observed that all such straight lines pass through a common point X , then find the co-ordinates of the point X .

- a) $\left(\frac{-3}{2}, \frac{-5}{2}\right)$
- b) $\frac{3}{2}, \frac{5}{2}$
- c) $\frac{2}{3}, \frac{-5}{3}$
- d) $\frac{-2}{3}, \frac{5}{3}$

Q28. DIRECTIONS for question 28: Type in your answer in the input box provided below the question.

If x is directly proportional to 6 more than the cube of y and x is 28 when y is 2, what is the value of y when x is 140?

Q29. DIRECTIONS for questions 29 to 33: Select the correct alternative from the given choices.

If 2 men and 5 women can complete a job in $7\frac{1}{2}$ days, while 5 men and 25 women can complete it in 2 days, find time in which 10 men would complete the work.

- a) $\frac{3}{4}$ day
- b) 1 day
- c) 3 days
- d) $\frac{9}{2}$ days

Q30. DIRECTIONS for questions 29 to 33: Select the correct alternative from the given choices.

A tank, of capacity 200 litres, has N taps, numbered from 1 to N , fitted to it. At the start of the n th minute, where $1 \leq n \leq N$, the tap numbered n , which empties the tank at the rate of n litres per minute, is opened. If $N > 60$ and the tank was completely full initially, then find the time (in minutes) after which the tank will be empty.

- a) $8\frac{5}{9}$
 b) $10\frac{4}{11}$
 c) $11\frac{3}{13}$
 d) $9\frac{7}{11}$

Q31. DIRECTIONS for questions 29 to 33: Select the correct alternative from the given choices.

If two litres of water is added to 5 litres of a 70% milk solution, find the percentage of water in the final solution.

- a) **35%**
 b) **45%**
 c) 50%
 d) **56%**

Q32. DIRECTIONS for questions 29 to 33: Select the correct alternative from the given choices.

If the length of the minute hand in a clock is 40% more than that of the hour hand, what is the ratio of the area swept by the minute hand to that swept by the hour hand between 7:50 a.m. and 8:40 a.m.?

- a) 16.8 : 1
 b) 23.52 : 1
 c) 12 : 1
 d) 18.44 : 1

Q33. DIRECTIONS for questions 29 to 33: Select the correct alternative from the given choices.

If the sum of the terms of an infinite geometric progression is 18 and the sum of the squares the terms is 162, find the common ratio of the progression.

- a) $\frac{2}{3}$
 b) $\frac{1}{3}$
 c) $\frac{1}{9}$

d) $\frac{2}{9}$

Q34. DIRECTIONS *for question 34:* Type in your answer in the input box provided below the question.

There are two positive integers a and b , where $a < b$, such that there are exactly 11 different arithmetic progressions (each having at least three terms) possible with a as the first term and b as the last term. If all the terms in the progressions are positive integers, then what can be the minimum value of b ?