

## VARC

**Q1. DIRECTIONS** for question 1: The sentences given in the following question (labeled a, b, c, d and e), when properly sequenced, form a coherent paragraph. Decide on the most logical order of the sentences that constructs a coherent paragraph and then enter the numbers corresponding to the sequential positions of sentences a, b, c, d and e, (in the final, coherent paragraph) in that order, in the input box given below the question. For example, if you think that the sequential positions of sentences a, b, c, d, and e are 4, 2, 5, 1 and 3 in the coherent paragraph, then enter 42513, as your answer, in the input box given below the question.

1. Constable recreated the area around Flatford Mill which was his father's first home.

2. The most famous painting John Constable ever painted is *The Haywain*, a portrait of a hay cart crossing a ford which owes something to Rubens's *View of Het Steen in the Early Morning*.

3. Clearly a metaphor for the tradition to which Constable was extremely sensitive, this work like all his best works is rooted in the emotional associations of his "careless boyhood".

4. This was a painting Constable greatly admired for the "joyous and animated character" Rubens imparted to the sky filling it with departing showers.

5. The house which figures so prominently in this work had earlier belonged to a man who lived his entire seventy years in Flatford.

**Q2. DIRECTIONS** for question 2: 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. There are competitions, for example, to find the person who can "spin the best yarn" on the spot.

2. Still, when it comes to these 'malicious' cases, they are not uncommon, but not the kind of persons we meet every day.

3. These we may set aside, as they are categorized as cases of unique psychological or personal trauma.

4. Roughly 8 percent of those who lie can be deemed pathological or malicious.

5. Occasionally, these individuals are seeking professional help for this, though the reason for these issues are poorly understood.

**Q3. DIRECTIONS** for question 3: The sentences given in the following question (labeled a, b, c, d and e), when properly sequenced, form a coherent paragraph. Decide on the most logical order of the sentences that constructs a coherent paragraph and then enter the numbers corresponding to the sequential positions of sentences a, b, c, d and e, (in the final,

coherent paragraph) in that order, in the input box given below the question. For example, if you think that the sequential positions of sentences a, b, c, d, and e are 4, 2, 5, 1 and 3 in the coherent paragraph, then enter 42513, as your answer, in the input box given below the question.

1. However, the high prevalence of dementia in the elderly can overshadow the importance of its occurrence in younger patients.
2. But it can also provide important biological insights that might also be applicable to the more common presentation in older patients.
3. For example, the high prevalence of inherited dementia in younger age-groups has led to the study of molecular pathology of direct relevance to the more common sporadic disease seen in older patients.
4. Young-onset dementia can present a substantial diagnostic challenge.
5. Dementia is a major public health concern that is a growing burden owing to an ageing society.

**Q4. DIRECTIONS** for question 4: 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.) While it is true that rigorous history and ethnography often give up generality for accuracy and precision, their conclusions can nonetheless have considerable importance. Scientific significance is not limited to the discovery of general laws - that idea is a \_\_\_\_\_(i)\_\_\_\_\_ from an age in which the scientific task was seen as one of \_\_\_\_\_(ii)\_\_\_\_\_ the Creator's rulebook, of thinking "God's thoughts after Him." Generality is to be prized, partly because it is often the key to answering questions wholesale rather than retail, partly because generalizing explanations are often deeper; but there are many non-general issues, concrete and individual questions, that \_\_\_\_\_(iii)\_\_\_\_\_ natural scientists.

Blank (i)	Blank (ii)	Blank (iii)
(1) hangover	(4) intransigence towards	(7) presumably overween
(2) hilarity	(5) inveighing against	(8) rightly occupy
(3) hauteur	(6) fathoming	(9) correctly preponderate

**Q5. DIRECTIONS** for question 5: The sentences given in the following question (labeled a, b, c, d and e), when properly sequenced, form a coherent paragraph. Decide on the most logical order of the sentences that

constructs a coherent paragraph and then enter the numbers corresponding to the sequential positions of sentences a, b, c, d and e, (in the final, coherent paragraph) in that order, in the input box given below the question. For example, if you think that the sequential positions of sentences a, b, c, d, and e are 4, 2, 5, 1 and 3 in the coherent paragraph, then enter 42513, as your answer, in the input box given below the question.

1. Yet octopuses react to us, turning “black with joy” or “white with anger” as responses to human actions, the new study revealed.
2. If two octopuses displayed dark colors, the encounter was likely to escalate aggressively but an octopus displaying paler colors indicated that it was preparing to retreat.
3. Octopuses are well-known masters of camouflage and skillful escape artists, but they aren't exactly famous for their social skills.
4. But a new study reveals that both male and female octopuses frequently communicate with each other in challenging displays that include changing color.
5. Scientists had long thought that this many-armed denizen of the deep was strictly solitary, reserving its color-shifting ability for intimidating or hiding from predators.

**Q6. DIRECTIONS** *for question 6:* 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. The first few panels of the stone reliefs were missing but those adorning the left side of Sennacherib's throne room depicted the Assyrian army attacking a fortified city.
2. The panels adorning the right side of Sennacherib's throne room showed defeated families leaving the city in mourning clothes.
3. In the throne room of King Sennacherib's Southwest Palace at Nineveh, Layard uncovered a series of beautifully carved stone reliefs that told a grisly tale of siege and destruction.
4. The siege of Lachish is mentioned in 2 Kings 18-19, 2 Chronicles 32, and Isaiah 36-37! - The year was 701 B.C. and Hezekiah, king of Judah, had revolted against his Assyrian overlord.
5. In the mid-1840s the British archaeologist Sir Austen Henry Layard made a spectacular discovery.

**Q7. DIRECTIONS** *for question 7:* The sentences given in the following question (labeled a, b, c, d and e), when properly sequenced, form a coherent paragraph. Decide on the most logical order of the sentences that constructs a coherent paragraph and then enter the numbers corresponding to the sequential positions of sentences a, b, c, d and e, (in the final, coherent paragraph) in that order, in the input box given below the question. For example, if you think that the sequential positions of sentences a, b, c, d,

and e are 4, 2, 5, 1 and 3 in the coherent paragraph, then enter 42513, as your answer, in the input box given below the question.

1. Hugh Grant, the firm's boss, says that without the sort of technological breakthroughs Monsanto has achieved, the world has no chance of doubling agricultural output by 2050.
2. But there are some admirers of the company as well who believe that Monsanto's innovations in seeds are the world's best hope of tackling a looming global food crisis.
3. The list of Monsanto's sins dates back to when it produced Agent Orange, a herbicide notorious for its use by American forces in Vietnam.
4. To its critics, the agricultural giant Monsanto is a corporate hybrid of Victor Frankenstein and Ebenezer Scrooge, creating foods that threaten the health of the planet, and using intellectual-property laws to make people poorer.
5. Bill Gates also sees Monsanto's innovations as essential to the agricultural revolution in Africa to which his charitable foundation is committed.

**Q8. DIRECTIONS** for question 8: 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 appearance of Walt Whitman's *Leaves of Grass* in a new edition has revived a discussion always imminent when the name of this writer is brought forward, and always more or less \_\_\_\_\_(i)\_\_\_\_\_. Some persons even imagine it obligatory upon them to deny him all merit of \_\_\_\_\_(ii)\_\_\_\_\_; so violent is their revolt against the offensiveness which Mr. Whitman has chosen to make a central and \_\_\_\_\_(iii)\_\_\_\_\_ point of his literary method.

Blank (i)	Blank (ii)	Blank (iii)
(1) penitential	(4) a demigod	(7) integral
(2) acrimonious	(5) poetic endowment	(8) indecorous
(3) cacophonous	(6) literary opprobrium	(9) inured

**Q9. DIRECTIONS** for question 9: The sentences given in the following question (labeled a, b, c, d and e), when properly sequenced, form a coherent paragraph. Decide on the most logical order of the sentences that constructs a coherent paragraph and then enter the numbers corresponding to the sequential positions of sentences a, b, c, d and e, (in the final, coherent paragraph) in that order, in the input box given below the question. For example, if you think that the sequential positions of sentences a, b, c, d, and e are 4, 2, 5, 1 and 3 in the coherent paragraph, then enter 42513, as your answer, in the input box given below the question.

1. With the advent and expansion of Christian monotheism, the organization of knowledge reflected the idea of a world governed by the laws dictated by God, its creator and legislator.
2. Llull introduced iconic tree-diagrams and forest-encyclopedias representing the organization of different disciplines including law, medicine, theology and logic.
3. Their combination would be expected to generate knowledge of the secrets of creation and help articulate knowledge of universal order (*mathesis universalis*).
4. From this tradition emerged encyclopedic efforts such as the *Etymologies*, compiled in the sixth century by the Andalusian Isidore, Bishop of Seville, the works of the Catalan Ramon Llull in the Middle Ages and those of the Frenchman Petrus Ramus in the Renaissance.
5. He also introduced more abstract diagrams to combinatorially encode the knowledge of God's creation in a universal language of basic symbols.

**Q10. DIRECTIONS** for question 10: 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. Officials beginning to investigate the case said that some of the US diplomats' symptoms were so severe that they were forced to cancel their tours early.
2. Cuba has never permitted, nor will permit, that Cuban territory be used for any action against accredited diplomatic officials or their families, with no exception.
3. In the autumn of 2016, a series of US diplomats visiting Cuba began suffering unexplained losses of hearing.
4. After months of investigation, US officials concluded that the diplomats had been attacked with an advanced sonic weapon (deployed outside their residences) that operated outside the range of audible sound.
5. Several of the diplomats were recent arrivals at the US embassy in Cuba, which reopened in 2015 as part of President Barack Obama's re-establishment of diplomatic relations with Cuba.



**DIRECTIONS** for questions 11 to 13: The passage given below is followed by a set of three questions. Choose the best answer to each question.

Referendums are supposed to get citizens engaged in politics and make governments responsive. If they worked, Europeans ought to be feeling particularly satisfied with their democracies. For referendums are on the rise...

Despite this direct democracy, Europeans are alienated from politics and furious with their governments. Referendum-mania has not slowed the rise of populist, Eurosceptic parties which attack the establishment as corrupt and out of touch. Plebiscites meant to settle thorny issues instead often aggravate them: after Scotland's independence referendum failed in 2014, membership of the Scottish National Party quadrupled, suggesting another confrontation is coming.

Referendums, it turns out, are a tricky instrument. They can bring the alienated back into politics, especially where the issues being voted on are local and clear. On rare occasions they can settle once-in-a-generation national questions, such as whether a country should be part of a larger union. But, much of the time, plebiscites lead to bad politics and bad policy. The most problematic are those on propositions that voters do not understand or subjects which are beyond governments' control. In 2015 Alexis Tsipras, prime minister of Greece, called a referendum on the bail-out offered by his country's creditors. His citizens - many of whom did not realise that refusal meant default - voted no. Mr Tsipras had to take the deal anyway, exacerbating the public's cynicism about politics.

Plebiscites that ask a country's voters what they think of a policy set by other countries often disappoint. The Dutch rejected the EU-Ukraine agreement, but may be stuck with much of it unless the EU's other 27 members agree to changes. Switzerland does domestic referendums well, but is in hot water over one that restricts immigration from the EU. That requires changes to its trade deal with the EU; Brussels will not budge. Because referendums treat each issue in isolation, they allow voters to ignore the trade-offs inherent in policy choices and can thus render government incoherent... A second danger is that fringe groups or vested interests use referendums to exercise outsized influence, particularly if few signatures are needed to call one and voter turnout is low.

These dangers can be mitigated. Requiring minimum turnouts can guard against the tyranny of the few. But the bigger point is that plebiscites are a worse form of democracy than representative government. James Madison was right when he wrote that democracies in which citizens voted directly on laws would be torn apart by factions...

**Q11.** Which of the following reasons can explain the rise in the membership of the Scottish National Party after Scotland's independence referendum?

- a) The referendum settled a once-in-a-generation issue of national importance.
- b) The referendum sparked an interest in the people who were out-of-touch with the issue of Scotland's independence.
- c) The referendum allowed the people to vote on an issue which they did not understand.
- d) Among the people who voted, the majority of them were against Scotland gaining independence.

**Q12.** Which of the following risks inherent in referendums can best be mitigated by the measure(s) suggested by the author in the last paragraph of the passage?

- a) Voters ignore the trade-offs inherent in the issues that are to be voted on.
- b) Minority groups may exercise disproportional influence through referendums to further their interests.
- c) Voters believe that the government is not paying heed to their opinion.
- d) Voters may not select the course of action which is beneficial to the current government.

**Q13.** Which of the following examples of referendums mentioned in the passage are on subjects beyond government's control?

1. Greece's referendum on the bailout offered by Greece's creditors
2. Dutch referendum on EU-Ukraine agreement
3. Scotland's referendum on Scottish independence
4. Switzerland's referendum on restrictions on immigration from the EU

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

**DIRECTIONS** for questions 14 to 16: The passage given below is followed by a set of three questions. Choose the best answer to each question.

**Being overweight can raise your blood pressure, cholesterol and risk for developing diabetes. It could be bad for your brain, too.**

A diet high in saturated fats and sugars, the so-called Western diet, actually affects the parts of the brain that are important to memory and make people more likely to crave the unhealthful food, says psychologist Terry Davidson,

director of the Center for Behavioral Neuroscience at American University in Washington, D.C.

He didn't start out studying what people ate. Instead, he was interested in learning more about the hippocampus, a part of the brain that's heavily involved in memory.

He was trying to figure out which parts of the hippocampus do what. He did that by studying rats that had very specific types of hippocampal damage and seeing what happened to them.

In the process, Davidson noticed something strange. The rats with the hippocampal damage would go to pick up food more often than the other rats, but they would eat a little bit, then drop it.

Davidson realized these rats didn't know they were full. He says something similar may happen in human brains when people eat a diet high in fat and sugar. Davidson says there's a vicious cycle of bad diets and brain changes. He points to a 2015 study in the *Journal of Pediatrics* that found obese children performed more poorly on memory tasks that test the hippocampus compared with kids who weren't overweight.

He says if our brain system is impaired by that kind of diet, "that makes it more difficult for us to stop eating that diet. ... I think the evidence is fairly substantial that you have an effect of these diets and obesity on brain function and cognitive function."

The evidence is growing. Research from the Cambridge Centre for Ageing and Neuroscience published in July found that obese people have less white matter in their brains than their lean peers - as if their brains were 10 years older. A more recent study from researchers at the University of Arizona supports one of the leading theories, that high body mass is linked to inflammation, which affects the brain.

**Q14.** Which of the following most comprehensively captures the relation between Western diet (as referred to in the passage) and memory function?

- a) Western diet may affect the hippocampus, because of which the memory function of the brain is impaired.
- b) Any damage to the hippocampus may result in people craving for Western diet.
- c) People who eat a diet high in saturated fats and sugars eat more because they forget that they are full.
- d) Western diet impairs the memory function of the hippocampus, which may result in people craving a diet high in saturated fats and sugars.

**Q15.** Which of the following can be best supported by Davidson's experiment mentioned in the passage?



- a) Eating a diet high in saturated fats and sugars affects the hippocampus adversely.
- b) An impaired hippocampus contributes to craving unhealthy food.
- c) A damaged hippocampus contributes to overeating.
- d) Both (A) and (B).

Q16.

Which of the following can be inferred to be true about white matter in people's brains?

- a) Following a diet with high quantities of saturated fats and sugars results in decrease of the white matter in the brain.
- b) Gaining excessive weight could result in the decrease of white matter in the brain.
- c) Having less white matter in the brain is a sign of obesity.
- d) Obese people behave in a mature way because of the aging of their brains.

**DIRECTIONS** for questions 17 to 22: The passage given below is followed by a set of six questions. Choose the best answer to each question.

SET in the heart of Cambridge, the chapel at King's College which is built in Gothic style is remarkable. These days such structures have fallen out of fashion. They are too complicated for the methods employed by most modern builders, and the skilled labour required to produce them is scarce and pricey. Now, new technologies are allowing designers to envisage such kind of structures again.

In a factory that makes precast concrete, in Doncaster, England, a robotic arm hangs over a wide platform, a dribble of hard pink wax dangling from a nozzle at its tip. Called FreeFAB, the system uses specialised wax to print ultra-precise moulds that, in turn, are used to cast concrete panels which are being installed in passenger tunnels as part of Crossrail, Europe's biggest construction firm. Run by Laing O'Rourke, a construction firm, FreeFAB is the first 3D-printing technology used in a big commercial building project. Show offices have been printed in Dubai and China, but are, for now, just concepts. The problem is that printed concrete is currently produced in layers, which are fused together to make a thicker panel. But the boundaries between the layers introduce weaknesses that make the panels unsuitable for real buildings. These things can peel apart.

FreeFAB gets around that problem by printing moulds rather than trying to print structural material directly. Invented by James Gardiner, an Australian architect, it has big advantages over traditional mould-making techniques. It creates far less waste. Ordinary moulds are made from wood and polystyrene, and can only be used to produce a single shape. Once they are finished with, they are scrapped and sent to landfill. FreeFAB's wax can be

melted down and poured back into the tank, ready to be re-extruded into a new form. It took Dr Gardiner three years to find a wax which could be printed, milled and recycled.

The system also makes it cheaper to make even complicated moulds.

Production of traditional moulds is highly skilled work. Making a mould for a concrete panel that curves along two different axes, like the ones used in Crossrail, takes about eight days. FreeFAB can print one in three hours. That speed makes it possible to meet the design and cost demands of more complicated buildings. Doing so with traditional methods would be expensive. And because the concrete itself is not being printed, the panels are just as strong as the ones made in the traditional way. FreeFAB's parts do not peel, and have withstood twice the required force in bomb-proofing tests.

It is early days. The factory in Doncaster has had teething problems - it has proved tricky to print moulds without flaws big enough to be visible in panels cast from them. But if the technology matures enough, Laing O'Rourke plans to spin it out as a startup focused on this new 3D-printed way of creating buildings.

If that happens, Philippe Block, an architectural engineer in Zurich, might be an early customer. Dr Block makes floors that have the flowing, veined look of biological membranes and are just a few centimetres thick. Instead of building floors that rely on steel reinforcement to hold them up, Dr Block builds them under compression, so that each bit of the floor holds up the rest in a shallow vault. Each is bespoke, designed by a computer to efficiently deal with the specific loads it must bear. This allows him to build much thinner structures out of materials much weaker than reinforced concrete.

Dr Block calculates that his new, thinner floors would need only about a third as much material as a typical floor slab. Their thinness allows him to claw back enough vertical space to fit three floors into the space that would be taken by two floors built in the standard way. At the Venice Architecture Biennale in 2016, Dr Block constructed a 15-metre vaulted "tent" out of 399 blocks of cunningly shaped limestone, each precisely milled to match the pattern of forces necessary to hold the vault up.

Dr Block's group will also make the floors for a new part of the building called HiLo. The main bottleneck is that it is expensive and slow to mill all the parts from blocks of stone, or to build traditional moulds for each individual component. So Drs Block and Gardiner are planning to work together on HiLo, using FreeFAB to print moulds that will produce segments of the floors.

Dr Gardiner also dreams about using FreeFAB to build thin bridges that span rivers in a single bound. For now, that is a project for the future.

**Q17.** According to the passage, why have Gothic style structures fallen out of fashion?

- a) They are old fashioned and costly to build.
- b) They are complicated to build and there is lack of skilled labour.
- c) Modern builders are reluctant to build such massive and intricately designed structures.
- d) People nowadays give more importance to utility, cost, ambience and convenience rather than aesthetic style or architectural designs.

**Q18.** Which of the following choices correctly summarizes the advantages of FreeFab as cited in the passage?

- a) FreeFab creates moulds from wood and polystyrene, reduces waste and the FreeFab technology is recyclable.
- b) FreeFab reduces cost, reduces the waste generation and the FreeFab technology is recyclable.
- c) FreeFab reduces cost, reduces the waste generation, prints moulds rather than structural material directly, takes 3 hours to create complex and durable designs, and the mould created can be recycled.
- d) FreeFab reduces cost, reduces the waste generation, takes 8 days to create complex designs, prints moulds rather than structural material directly, and the mould created can be recycled.

**Q19.** Who was the inventor of FreeFab and what was time taken to find the specialized wax used in the technology?

- a) Dr. James Gardiner, an American Architect; 3 years
- b) Laing O'Rourke, a Chinese Architect; 5 years
- c) Dr. Philippe Block, a Swiss Architect; 8 days
- d) James Gardiner, an Australian Architect; 3 years

**Q20.** What is the new project that Dr. Block and Dr. Gardiner are planning to collaborate on?

- a) They plan to use FreeFab to print moulds that will produce the segments of floors for HiLo.
- b) They plan to use FreeFab to print moulds that will produce the segments of panels for HiLo.
- c) They plan to outsource the mature version of the FreeFab technology to start-ups.
- d) They plan to build thin bridges that span rivers in a single bound.

**Q21.** Which of the following cannot be understood about the architectural technique already employed by Dr. Philippe Block as discussed in the passage?

- a) He makes floors that resemble biological membranes and are just a few centimetres thick.
- b) His floors are designed to maximize usage of space, can deal with specific loads and need less starting raw material.
- c) Each bit of his floor can withstand the external forces and can hold up the rest in a shallow vault.
- d) He relied on steel reinforcements to hold the floors up.

**Q22.** What is the current limitation of the FreeFab technology as can be inferred from the passage?

- a) The boundaries between printed concrete layers introduce weaknesses that make the panels unsuitable for real buildings.
- b) The moulds printed using FreeFab's wax are not without flaws and the technology is still in its early days.
- c) The FreeFab technology needs more starting material as compared to Dr. Philippe Block's methodology.
- d) The FreeFab technology cannot be employed for making structures involving the use of vaults.

**DIRECTIONS** for questions 23 to 28: The passage given below is followed by a set of six questions. Choose the best answer to each question.

Nations have tugs of war over the official definition of the word "genocide" - which mentions only national, ethnic, racial and religious groups. Look at the annual international tussle over whether the 1915 Turkish massacre and deportation of the Armenians "counts" as genocide.

Norman Naimark, author of the controversial new book *Stalin's Genocides*, argues that we need a much broader definition of genocide, one that includes nations killing social classes and political groups. His case in point: Stalin.

The book's title is plural for a reason: He argues that the Soviet elimination of a social class, the kulaks (who were higher-income farmers), and the subsequent famine which killed 3-5 million Ukrainian peasants - as well as the notorious 1937 order No. 00447 that called for the mass execution and exile of "socially harmful elements" as "enemies of the people" - were, in fact, genocides.

"I make the argument that these matters shouldn't be seen as discrete episodes, but seen together," said Naimark, a respected authority on the Soviet regime. "It's a horrific case of genocide - the purposeful elimination of all or part of a social group, a political group."

Stalin had nearly a million of his own citizens executed, beginning in the 1930s. Millions more fell victim to forced labor, deportation, famine, massacres, and detention and interrogation by Stalin's henchmen.

The term "genocide" was defined by the 1948 United Nations Convention on the Prevention and Punishment of the Crime of Genocide. The convention's

work was shaped by the Holocaust - "that was considered *the* genocide," said Naimark.

"A catastrophe had just happened, and everyone was still thinking about the war that had just ended. This always occurs with international law - they outlaw what happened in the immediate past, not what's going to happen in the future."

"There was more similarity between Hitler and Stalin than usually acknowledged: "Both chewed up the lives of human beings in the name of a transformative vision of Utopia. Both destroyed their countries and societies, as well as vast numbers of people inside and outside their own states. Both, in the end, were genocidaires."

All early drafts of the U.N. genocide convention included social and political groups in its definition. But one hand that wasn't in the room guided the pen. The Soviet delegation vetoed any definition of genocide that might include the actions of its leader, Joseph Stalin. The Allies, exhausted by war, were loyal to their Soviet allies - to the detriment of subsequent generations. ... Accounts "gloss over the genocidal character of the Soviet regime in the 1930s, which killed systematically rather than episodically," said Naimark. In the process of collectivization, for example, 30,000 kulaks were killed and 2 million deported.

We will never know how many millions Stalin killed. "And yet somehow Stalin gets a pass," Ian Frazier wrote in a recent *New Yorker* article about the gulags. "People know he was horrible, but he has not yet been declared horrible officially."

TIME magazine put Stalin on its cover 11 times. Russian public opinion polls still rank him near the top of the greatest leaders of Russian history.

There's a reason for Russian obliviousness. Every family had not only victims but accomplices and perpetrators. "A vast network of state organizations had to be mobilized to seize and kill that many people," Naimark wrote.

"How much can you move on? Can you put it in your past? How is a national identity formed when a central part of it is a crime?" Naimark asked. "The Germans have gone about it the right way," he said, pointing out that Germany has pioneered research about the Holocaust and the crimes of the Nazi regime. "Through denial and obfuscation, the Turks have gone about it the wrong way."

Without a full examination of the past, Naimark observed, it's too easy for it to happen again.

**Q23.** According to the passage, all of the following statements regarding Stalin are true EXCEPT?

- a) Stalin executed nearly a million Russians.

- b) When it comes to the use of the word “genocide”, public opinion has been kinder to Stalin than to Hitler.
- c) Community complicity has prompted the blind eye towards Stalin's pogroms.
- d) Stalin vetoed any definition of genocide that might incriminate him.

**Q24.** According to the passage, Naimark's book has the title in plural because

- a) The title required a powerful punch.
- b) Many politically active groups were targeted by Stalin.
- c) Naimark believes that the systematic elimination of certain classes of people qualifies as genocidal in character.
- d) The Ukrainian peasants died of starvation when the kulaks were eliminated.

**Q25.** The term ‘Russian obliviousness’ in the passage implies that

- a) one cannot be sure if Stalin qualifies as a genocidaire.
- b) the Russians are living in denial.
- c) the Russians remember their immediate past but they neither fret about things that happened a long long time back nor worry about the likely state of affairs in the future.
- d) it is better to face the truth than live in the dark, one must reckon with the past.

**Q26.** According to Naimark, the definition of genocide

- a) must be widened.
- b) is adequate to exonerate Stalin.
- c) paints Stalin and Hitler with the same brush.
- d) attracts controversy.

**Q27.** It is stated in the passage that the term ‘genocide’

- a) was defined with future implications in mind.
- b) took the destructive utopian vision of both Stalin and Hitler into account.
- c) took into account systematic genocides rather than episodic genocides.
- d) emerged after the world witnessed the Holocaust during the Second World War.

**Q28.** Who, according to Naimark, have gone about forming a national identity, in spite of criminality in their past, in the correct manner?



- a) The Turks who denied their role in the killing and deportation of the Armenians.
- b) The Germans who carried out research about Nazi crimes and the Holocaust.
- c) The Soviet Regime who massacred and exiled the “enemies of the people”.
- d) The Allies who were loyal to their Soviet Allies during and after the World War II.

**DIRECTIONS** for questions 29 to 34: The passage given below is followed by a set of six questions. Choose the best answer to each question.

There are few things that have more changed our world than has science. Scientists and their discoveries have helped transform material conditions and opened up new social and moral vistas. Yet it is the very notion of human-directed change that many people today find so troubling. No period has been more penetrated by science, nor more dependent upon it, than the past half century. Yet no period has been more uneasy about it, nor felt more that the relationship with scientific knowledge is a Faustian pact. ...

No science has seemed more to call all in doubt than the science of biology. From genetic engineering to cloning, from test tube babies to xenotransplantation, from the mapping of the human genome to the possibility of ending the menopause, biology has truly disturbed our universe. Opinion formers in society worry that man is now playing God, remaking nature in his own image. Bryan Appleyard is terrified by the way that science has invaded the human realm. “The new biology entails the thwarting of nature at a very fundamental level. Genetics must be contained, humbled.”

But while there is immense fear about the practical consequences of biological sciences, there is an equally immense support for biological theories of human nature. Richard Dawkins, Steven Pinker, E. O. Wilson, Matt Ridley, Jared Diamond – evolutionary biologists are among the literary superstars of our age, as much entertainers as scientists, writing bestsellers, and injecting evolutionary wisdom into all manner of political and cultural debates.

This contrast between hostility to biological experimentation and embrace of evolutionary psychology should not surprise us. What many people fear is a science that disturbs their moral compass, upsetting traditional ideas of Man and nature, a science that promises new forms of control over nature, new types of mastery over human destiny. What many people are drawn to is a science that provides science and comfort, and turns an explanation about the human condition into a parable about fate.

The common threads in hostility to biological science and a yearning for evolutionary stories are a debased view of what it means to be human and an exalted view of nature. ‘In a secular civilization’, Mary Douglas and Aaron

Wildavsky observe, 'nature plays the role of general arbiter of human designs more plausibly than God'. In the 19th century, positivists recast science as a new faith, and nature as a new God, at a time when the old religion appeared inadequate for Man's needs. Today, too, nature is rapidly turning into a new deity to whom we turn for moral answer and personal comfort. And yet, Western society's relationship to nature is very different from what it was two centuries ago. Then, faith in the laws of nature required a sense of confidence about human progress. Today, faith in nature expresses pessimism about the human condition. In an age in which humans and human activity are held in low esteem, there is a tendency to deify nature. In almost every aspect of life, the 'natural' is regarded as morally superior to the artificial or the human. Natural health treatments, from acupuncture to reflexology, are seen as preferable to the alienating high technology of modern medicine. As Norman Levitt put it 'The "natural" is the virtuous opposite of the degraded manifestations of humanity's fallen state.' The deification of nature has led many both to decry science that seems to defile the purity of nature and to laud science that seems to make us more natural. Biological technology that threatens to transform our relationship with nature is often seen as unnatural and blasphemous. 'Have we the right', the molecular biologist Ervin Chargaff asks, 'to counteract, irreversibly, the evolutionary wisdom of millions of years? Each generation must be allowed to struggle with human nature as it is given to them, and not with the irreversible biological results of their forbears' actions. We cannot impose on future generations our conceptions of improvement, because to do so represents an assault on human dignity. For it is a struggle with the givens of human nature that defines humanity, not the progressive effort to transform that nature.

**Q29.** According to the passage, the deification of nature

- a) is a consequence of low self esteem in which humans and their activities are held.
- b) is a reaction to biological science that makes for natural and blasphemous changes.
- c) is to counter the pernicious effect of new scientific discoveries on society.
- d) can be attributed to an exalted view of nature that people have in a secular civilization.

**Q30.** According to the author, all among the following are the literary superstars of our age EXCEPT?

- a) Richard Dawkins
- b) Steven Pinker
- c) Mary Douglas

d) E. O. Wilson

**Q31.** Why do we feel that our relationship with science is a Faustian pact?

- a) Over the past 50 years, we have come to depend on science more and more.
- b) While science has given us immense power, it has disturbed our moral compass.
- c) Science penetrates every aspect of our life calling accepted facts into question.
- d) Scientific theories have continuously revolutionized the way we look at Nature.

**Q32.** In the passage, the author

- a) examines the implications of scientific progress for man and nature.
- b) justifies the need to examine scientific discoveries under the microscope of reality.
- c) voices society's concern over scientists playing God.
- d) presents science as a double-edged sword.

**Q33.** According to the author, what kind of science is not feared by people?

- a) Science that realigns their moral compass.
- b) Science that upsets traditional ideas of man and nature.
- c) Science that attributes the condition of humanity to destiny.
- d) Science that results in new types of mastery over human destiny and nature.

**Q34.** Which of the following can be inferred to be definitely false from a reading of the passage?

- a) According to Aaron Wildavsky, we turn to nature as a new deity because it provides us with a compass for our behaviour.
- b) Ervin Chargaff asserts that new generations must struggle with the irreversible biological results of their predecessors.
- c) Norman Levitt viewed "the natural" as the contradiction of a human extreme.
- d) Bryan Appleyard believes that fields like genetics and molecular biology upset the apple cart of nature's principles.

DILR

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

Each of three persons, Bill, Bob and Buck, is from a different island among Bicker Island, Backer Island and Becker Island, not necessarily in the same order. However, all the persons from one of the three islands are Truth Tellers, i.e., they always speak the truth; all the person from another of the three islands are Liars, i.e., they always lie; all the persons from the third island are Alternators, i.e., they always alternate between telling the truth and a lie, in any order.

The three of them made the following statements:

*Bill:* Bob is not the Alternator.  
All the persons from Backer Island are Truth Tellers.

*Bob:* All the persons from Becker Island are Alternators.  
I am the Truth Teller.

*Buck:* Bill is not from Bicker Island.  
Bob is an Alternator.

Q1.

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

Which island is Buck from?

- a) Bicker Island
- b) Becker Island
- c) Backer Island
- d) Cannot be determined

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

Who among the following definitely made at least one true statement?

- a) Bill
- b) **Bob**
- c) Buck
- d) More than one of the above

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

If Bill is not the Liar, then who is the Truth Teller?

- a) **Bob**
- b) Bill
- c) Buck

d) Cannot be determined

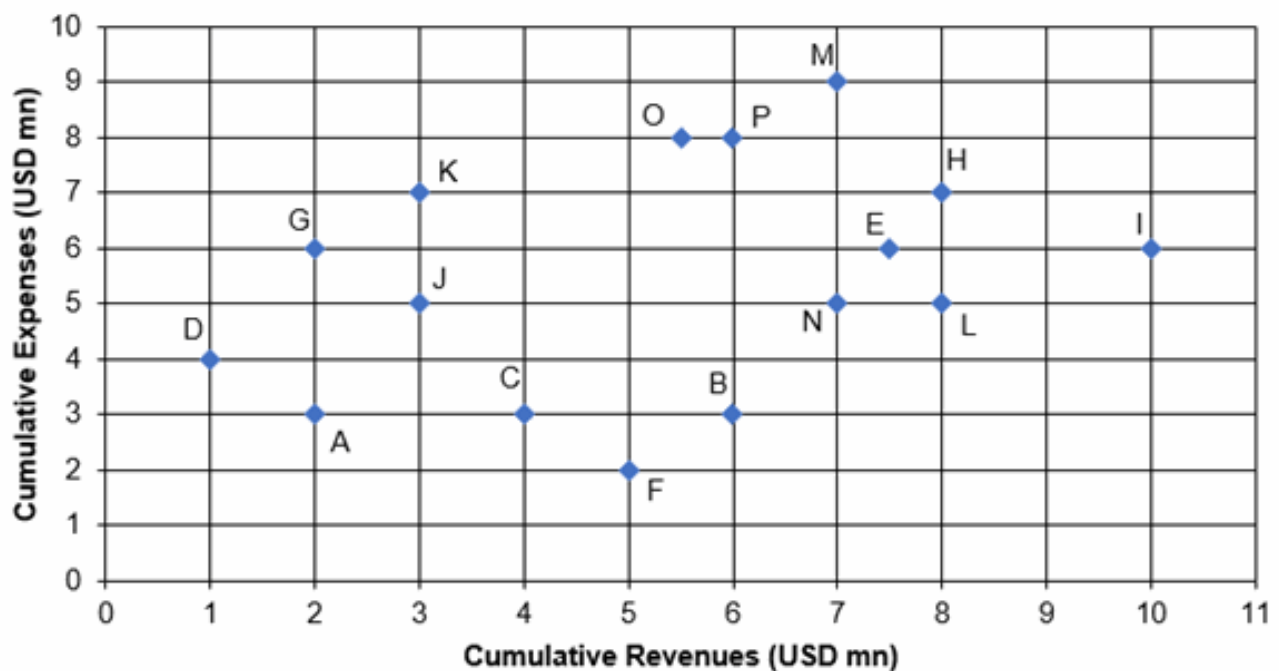
**Q4. DIRECTIONS** for questions 1 to 4: Select the correct alternative from the given choices.

Which of the following statements is definitely true?

- a) The number of true statements made by Bob was more than that by Bill.
- b) The number of true statements made by Bill was more than that by Buck.
- c) The number of true statements made by Bill was more than that by Bob.
- d) The number of true statements made by Buck was more than that by Bob.

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

Rajeev, an MBA student, calculated and plotted the Cumulative Expenses (in USD mn) and Cumulative Revenues (in USD mn) for the four quarters of a particular year, for four different companies. The Cumulative Expenses/ Cumulative Revenues for any quarter are calculated as the sum of the Expenses/Revenues of all the quarters in that year until that quarter (including that quarter). Also, it is known that each of the four companies had positive Revenues and positive Expenses in each quarter of that year. The following scatter plot shows the Cumulative Expenses and Revenues that Rajeev plotted.



Note: Profit = Revenues – Expenses  
 Profit Percentage = (Profit/Revenues)\*100

**Q5. DIRECTIONS** *for question 5:* Type in your answer in the input box provided below the question.

If the data points A, B, C... P are represented by their numerical equivalents as 1, 2, 3... 16 respectively, enter the numerical equivalents of the data points representing the first four quarters, *from first quarter to the fourth quarter, in that order, next to each other*, of the company to which the data point N corresponds. For example, if A, B, C and P represents the first, second, third and fourth quarters of a company respectively, enter your answer as '12316'.

**Q6. DIRECTIONS** *for questions 6 to 8:* Select the correct alternative from the given choices.

How many of the four companies made a profit in the third quarter?

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

**Q7. DIRECTIONS** *for questions 6 to 8:* Select the correct alternative from the given choices.

If the company to which the data point M corresponds did not incur a loss in the third quarter, what is the profit made in the fourth quarter by the company to which the data point G corresponds?

- a) USD 0.5 mn
- b) USD 1 mn
- c) USD 1.5 mn
- d) USD 2 mn

**Q8. DIRECTIONS** *for questions 6 to 8:* Select the correct alternative from the given choices.

How many companies incurred a loss in the second quarter?

- a) 3
- b) 2
- c) 1
- d) Cannot be determined

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

A compiler is a program that converts software instructions into machine language so that the instructions can be read and executed by a computer. A certain compiler compiles software code every day and is designed to detect



and report five types of errors - Logical error, Semantic error, Syntax error, Referencing error and Runtime error - in the code. At the end of each day, the compiler generates a string of digits, called Info String, which consists of the error codes generated during the day along with other information not pertaining to any of the above errors.

The error codes, which are in the form of a string of 3 or 4 digits, occur in the Info String of any day if and only if the compiler detects the corresponding errors in the program during that day. Further, the error codes appear in the Info Strings in the same order in which they were detected during the day, with the error code on the extreme left of the Info String being detected first and the one on the extreme right being detected the last.

The first table given below provides the error codes for the different types of errors and the second table provides the Info String for each of seven days, Day 1 to Day 7.

Errors	Error Codes
Syntax Error	527
Semantic Error	419
Logical Error	2378
Runtime Error	681
Referencing Error	913

Day	Info String
Day 1	34852711237815232527941419036810391375271
Day 2	441923711237891618681314196768191340
Day 3	145681014741803241932147823780
Day 4	745251419491434192123784154189652164681681052
Day 5	125245270494681241904913
Day 6	23419046168132913913646804568134
Day 7	1527419391314237812468521395

**Q9. DIRECTIONS** for questions 9 and 10: Type in your answer in the input box provided below the question.

On how many days, out of the seven days, was no syntax error detected?

**Q10. DIRECTIONS** for questions 9 and 10: Type in your answer in the input box provided below the question.

During the seven days, what is the total number instances in which a Referencing error was detected before a Runtime error, both on the same day, with no other error being detected in between?

**Q11. DIRECTIONS** for questions 11 and 12: Select the correct alternative from the given choices.

During the seven days, what is the number of Semantic errors detected as a percentage of the total errors detected (approximately)?

- a) 26.47%
- b) 23.53%
- c) 28.57%
- d) 27.27%

**Q12. DIRECTIONS** for questions 11 and 12: Select the correct alternative from the given choices.

Which of the following statements is false?

- a) Semantic error is the only error that was detected on each of the seven days.
- b) The minimum number of errors occurred on Day 3.
- c) The number of Logical errors detected during the seven days was lower than the number of errors of any of the other four types detected.
- d) The total number of Referencing errors that occurred during the seven days is greater than the total number of Syntax errors.

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

Hari was playing with a certain number of unit cubes (i.e., cubes of unit dimensions) of three different colours - Red, Green and Blue. He arranged these cubes such to form a large cube, such that the cubes at all the corners of the large cube were Red, all the cubes that were along any edge but not at the corners of the large cube were Green and all the remaining cubes in the large cube were Blue.

**Q13. DIRECTIONS** for questions 13 to 16: Type in your answer in the input box provided below the question.

If Hari had exactly 24 Green unit cubes, how many unit cubes will be in the largest cube that he can make?

**Q14. DIRECTIONS** for questions 13 to 16: Type in your answer in the input box provided below the question.

If Hari formed a cube of dimensions  $7 \times 7 \times 7$ , how many Blue unit cubes would he have used?

**Q15. DIRECTIONS** for questions 13 to 16: Type in your answer in the input box provided below the question.

In a cube, if the number of Green unit cubes is at least half the number of Blue unit cubes, what is the maximum possible number of unit cubes that can be in the larger cube?

**Q16. DIRECTIONS** for questions 13 to 16: Type in your answer in the input box provided below the question.

If, in a larger cube, the number of Blue unit cubes is more than four times the number of Red unit cubes, what is the minimum number of Green unit cubes that will be in the larger cube?

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

In the year 2060, NASA sent each of five different rovers to a different planet among, Saturn, Jupiter, Neptune, Mercury and Pluto. Each rover had a different name among Mettle, Courage, Passion, Pluck and Valour. In each rover, there was a different instrument among Spectrometer, Microscopic Imager, Methane Sensor, Photometer and Mass Analyser.

The following information is known about the rovers:

1. The name of the rover sent to any planet did not start with the first letter of the name of the planet that it was sent to.
2. The rover named Mettle, which did not have a Microscopic Imager, was not sent to Jupiter.
3. The rover named Valour had Methane Sensor, while the rover sent to Pluto had a Microscopic Imager.
4. The rover sent to Neptune had Mass Analyser but was not named Mettle, while the rover sent to Jupiter did not have a Methane Sensor.
5. The rover named Passion did not have a Spectrometer and the rover sent to Saturn had a Photometer.

**Q17. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

What is the name of the rover sent to Neptune?

- a) Courage
- b) Passion
- c) Pluck
- d) Valour

**Q18. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

Which planet was Pluck sent to?

- a) Saturn
- b) Mercury
- c) Jupiter
- d) Neptune

**Q19. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

The rover sent to Mercury had a

- a) Microscopic Imager.
- b) Spectrometer.
- c) Methane Sensor.
- d) Cannot be determined

**Q20. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

The rover named Courage was sent to

- a) Saturn.
- b) Mercury.
- c) Jupiter.
- d) Pluto.

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

Exactly six teams - A through F - participated in a hockey tournament, in which each team played against each of the other teams exactly once. No match ended in a draw and, in each match, the winning team scored exactly one goal more than the losing team.

The following table provides the number of goals scored by (GF) and the number of goals scored against (GA) each team:

Team	GF	GA
A	14	15
B	13	18
C	13	12
D	15	10
E	19	22
F	13	10

**Q21. DIRECTIONS** for questions 21 to 23: Select the correct alternative from the given choices.

Against which of the following teams did C win a match?

- a) **D**
- b) **E**
- c) **F**
- d) More than one of the above

**Q22. DIRECTIONS** for questions 21 to 23: Select the correct alternative from the given choices.

If the number of goals scored by D in any match was distinct, what is the maximum number of goals any team would have scored against D?

- a) **3**
- b) **6**
- c) **5**
- d) **4**

**Q23. DIRECTIONS** for questions 21 to 23: Select the correct alternative from the given choices.

Against which of the following teams did F lose a match?

- a) **A**
- b) **B**
- c) **C**
- d) None of the above

**Q24. DIRECTIONS** for question 24: Type in your answer in the input box provided below the question.

What is the maximum number of goals that A could have scored in the match against C?

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

Gaurav was the invigilator for an exam, the question paper for which had three different test forms - Form 1, Form 2 and Form 3. Six students - A through F - appeared for the exam, and they were seated in six equally spaced chairs around a circular table, not necessarily in the same order. Gaurav distributed the test forms to the six students such that no two students sitting adjacent to each other received the same test form.

Further, it is also known that

1. at least one student received each test form and more than two students received one of the test forms.
2. B, who did not receive Form 2, was sitting to the left of D, who was not sitting opposite any student who received Form 3.
3. A and F are not sitting opposite each other but they received the same test form, which was not Form 2.
4. E, who was sitting adjacent to neither B nor D, received Form 3.

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

Who among the following can be sitting opposite A?

- a) **E**
- b) **B**
- c) **C**
- d) None of the above

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

Who among the following received Form 1?

- a) **C**
- b) **B**
- c) **D**
- d) More than one of the above



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

Which form did the person sitting opposite C receive?

- a) Form 1
- b) Form 2
- c) Form 3
- d) Cannot be determined

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

Which of the following statements is sufficient to determine the test forms that each student received?

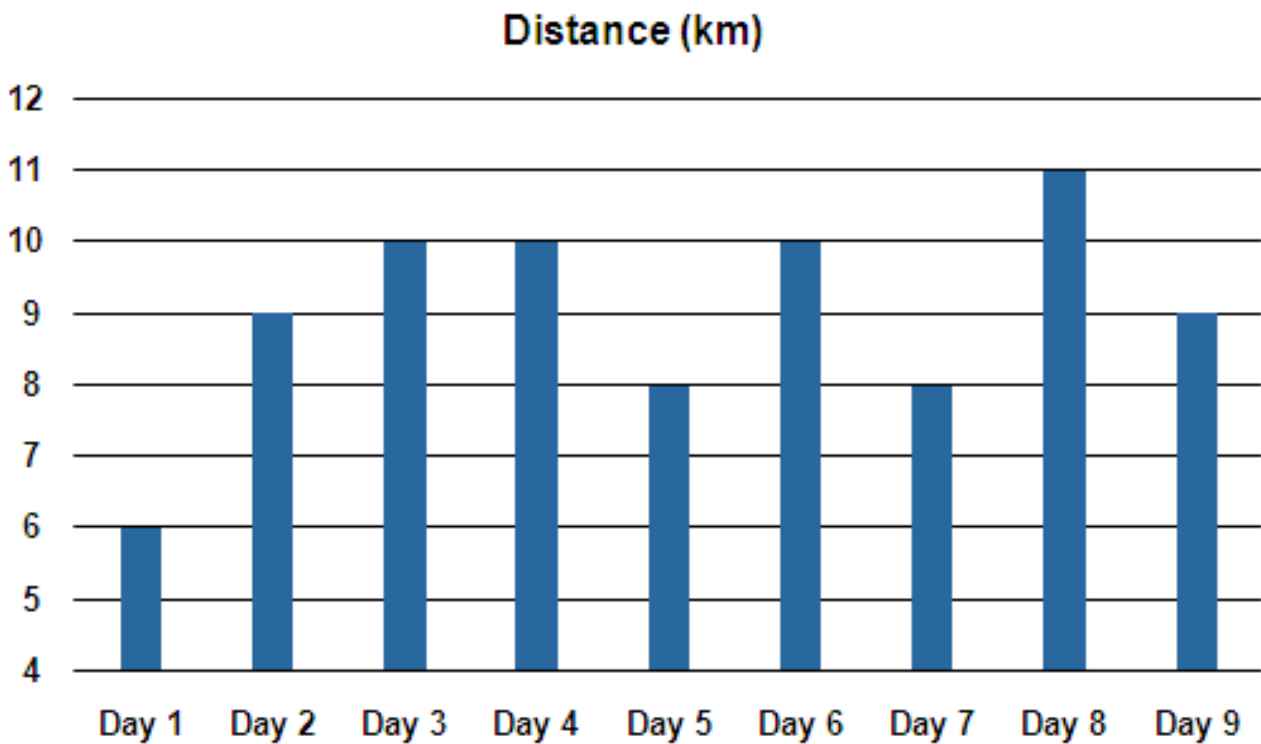
- a) A is sitting adjacent to a student who received Form 2.
- b) C is sitting two places away from a student who received Form 2.
- c) E is sitting two places away from a student who received Form 2.
- d) None of the above

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

Phil, a fitness enthusiast, goes running every evening. The distance that he runs depends on the type of food that he ate during the day. On the days that he eats Pastries or Pizzas or Burgers or Ice Creams or French Fries, he runs for a longer distance.

During any day, if he did not eat Pastries or Pizzas or Burgers or Ice Creams or French Fries, he runs for exactly 3 km. However, during the day, if he ate Pastries, he runs for an additional 1 km; if he ate Ice Creams, he runs for an additional 2 km; if he ate French Fries, he runs for an additional 3 km; if he ate Burgers, he runs for an additional 4 km; if he ate Pizzas, he runs for an additional 5 km. On any day, if he ate more than one of the five types of food mentioned above, he runs the additional distances corresponding to all the types of food that he ate on that day. He does not eat anything after he goes for a run on any day.

The bar graph below provides the distance that Phil ran for nine days, from Day 1 through Day 9. Further, it is known that he did not eat the sametype of food on any two consecutive days during the nine days.



**Q29. DIRECTIONS** for questions 29 to 32: Select the correct alternative from the given choices.

During the nine days, on how many pairs of consecutive days did Phil eat Pizzas on the first day and French Fries on the next day?

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

**Q30. DIRECTIONS** for questions 29 to 32: Select the correct alternative from the given choices.

On which of the following days did Phil eat Pastries?

- a) Day 1
- b) Day 3
- c) Day 2
- d) Day 9

**Q31. DIRECTIONS** for questions 29 to 32: Select the correct alternative from the given choices.

Which of the following food items did Phil eat on the maximum number of days during the given period?

- a) French Fries
- b) Ice Creams
- c) Pizzas
- d) Pastries

**Q32. DIRECTIONS** for questions 29 to 32: Select the correct alternative from the given choices.

On how many of the nine days did Phil eat Burgers but did not eat French Fries?

- a) 5
- b) 2
- c) 0
- d) 3

QA

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

The first two terms of a geometric progression are the same as the first two terms of an arithmetic progression respectively. If the common difference of the arithmetic progression is 24 and the third term of the geometric progression is 2.4 more than the third term of the arithmetic progression, find the second term of the geometric progression.

**Q2. DIRECTIONS** for questions 1 and 2: Type in your answer in the input box provided below the question.

Find the sum of the first 32 terms of the series.

$$1.2 + 2.3 + 3.4 + 4.5 + \dots$$

**Q3. DIRECTIONS** for question 3: Select the correct alternative from the given choices.

If the sum of six integers  $x_1, x_2, x_3, x_4, x_5$  and  $x_6$  is 9753 and E

$$= \sum_{i=1}^{i=6} (-1)^{x_i}, \text{ what is the least possible value of E?}$$

- a) -2
- b) -4
- c) -5
- d) -6

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

Two persons, A and B, started simultaneously from P towards Q. The speed of B is one-sixth more than that of A. As soon as B reached Q, he turned back and on his way towards P, met A at R. Find the distance PQ (in km), if the distance PR is 48 km.

**Q5. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

A beaker contained V litres of a mixture of milk and water, with milk and water in the ratio of 3 : 2. The total volume of the mixture was increased by 60% by adding water. Next, 38.4 litres of the solution in the beaker was replaced by water. If the final ratio of milk and water in the beaker is 3 : 7, find the value of V (in litres).

- a) 80
- b) 96
- c) 120
- d) 192

**Q6. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

The 342nd term of the series 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 5, ..... is

- a) 24.
- b) 25.
- c) 26.
- d) 27.

**Q7. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

A quadratic function  $f(x)$  attains its minimum value of -15 at  $x = 3$ . If  $f(0) = 5$ , find the value of  $f(9)$ .

- a) 65
- b) 55
- c) -25

d) 75

**Q8. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

If  $a : b = 3 : 2$ ;  $b : c = 4 : 5$ ;  $c : d = 5 : 6$  and  $d : e = 6 : 5$ , find the value

of  $\frac{ad + ce}{bc + ae}$ .

- a) 1.22
- b) 1.33
- c) 1.44
- d) 1.66

**Q9. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

There are two lighted candles whose rates of burning (in cm/min) are in the ratio of 2 : 1. At 6:00 p.m., their lengths are in the ratio of 3 : 2 and at 9:00 p.m., their lengths are in the ratio of 2 : 3. At what time were their lengths equal?

- a) 7:30 p.m.
- b) 8:00 p.m.
- c) 8:24 p.m.
- d) 8:36 p.m.

**Q10. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

If  $\log_2 (\log_4 2^{(a-b)}) = 2\log_2 (\sqrt{a} - \sqrt{b}) + 1$ , what percentage of  $a$  is  $b$ ?

- a) 44.44%
- b) 36%
- c) 60%
- d) Cannot be determined

**Q11. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

ABC is a triangular field, in which sides AB and BC are perpendicular to each other. A car started from A towards C, along the side AC. On reaching a point D, it was exactly as far from each of B and C as B was from C. Find the ratio BD : AD.

- a)  $1 : \sqrt{3}$
- b)  $\sqrt{3} : 1$

- c) 1 : 1  
 d)  $\sqrt{3}$  : 2.

**Q12. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

For real numbers  $x$  and  $y$ , let

$$f(x, y) = (x + y)^2, \text{ if } x + y \geq 0 \\ = -(x + y), \text{ if } x + y < 0$$

$$g(x, y) = \sqrt{x + y}, \text{ if } x + y \geq 0 \\ = (x + y)^2, \text{ if } x + y < 0$$

Which of the following expressions is necessarily positive for non-zero real numbers  $x$  and  $y$ ?

- a)  $(f(x, y))^2 - (g(x, y))^2$   
 b)  $(f(x, y))^2 - g(x, y)$   
 c)  $f(x, y) + g(x, y)$   
 d)  $f(x, y) - g(x, y)$

**Q13. DIRECTIONS** for questions 5 to 13: Select the correct alternative from the given choices.

$H(a, b, c, d) = 2a + 3bc + 4c^2d$ . If  $a, b, c$  and  $d$  increase by 80%, 50%, 20% and 25% respectively, what is the percentage increase in  $H(a, b, c, d)$ ?

- a) 80%  
 b) 92%  
 c) 160%  
 d) Cannot be determined

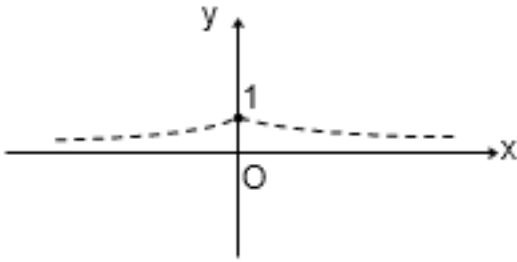
**Q14. DIRECTIONS** for question 14: Type in your answer in the input box provided below the question.

The price of a ticket to a theatre, when it is houseful is Rs.40. For every Re.1 increase in the price of the ticket, the number of tickets sold goes down by 5. If the capacity of the theatre is 600, what is the maximum possible revenue (in Rs.) from the sale of tickets?

**Q15. DIRECTIONS** for questions 15 to 17: Select the correct alternative from the given choices.

Which of the following functions corresponds to the graph shown below?

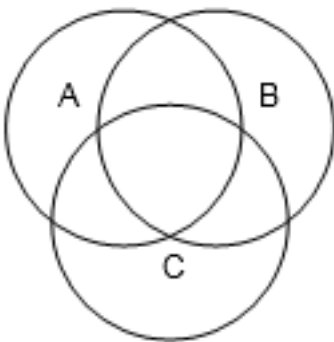




- a)  $y = \frac{1}{\ln x}$
- b)  $y = \frac{1}{e^x}$
- c)  $y = \frac{1}{e^{|x|}}$
- d)  $y = e^{|x|}$

**Q16. DIRECTIONS** for questions 15 to 17: Select the correct alternative from the given choices.

There are three circles of equal radii, with centres at A, B and C as shown in the figure below. Each circle passes through the centres of the other two circles. If the radius of each circle is 6 cm, what is the perimeter (in cm) of the figure?



- a)  $12 \pi$
- b)  $24 \pi$
- c)  $27 \pi$
- d)  $18 \pi$

**Q17. DIRECTIONS** for questions 15 to 17: Select the correct alternative from the given choices.

Which of the equations given below best describes the data provided?

$t$	-2	-1	0	2	3
$v$	2.5	1	-0.5	-3.5	-5

- a)  $v = -1.5 t - 0.5$
- b)  $v = 1.5 t - 0.5$
- c)  $v = -2.5 t - 2.5$
- d)  $v = -1.5 t + 0.5$

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

If  $n$  is a natural number less than 100 and  $k$  is any whole number, for how many values of  $n$  is  $n^2 = 24k + 1$ ?

**DIRECTIONS** for questions 19 and 20: Answer the questions on the basis of the information given below.

A company manufactures a certain number of different flavours of chocolates and packs them in different types of packets such that each type of packet contains a different combination of chocolates of one or more flavours. No packet contains more than one chocolate of the same flavour.

Q19.

**DIRECTIONS** for questions 19 and 20: Type in your answer in the input box provided below the question.

If the company packs 671 different types of packets, what is the minimum number of different flavours of chocolates that the company manufactures?

Q20.

**DIRECTIONS** for questions 19 and 20: Type in your answer in the input box provided below the question.

If the company manufactures 12 different flavours of chocolates, the number of different types of packets that they can pack is at most

**Q21. DIRECTIONS** for questions 21 and 22: Select the correct alternative from the given choices.

What is the area (in sq.cm) of a square whose vertices lie on the sides of an equilateral triangle of side 1 cm?

a)

$$4 - 2\sqrt{3}$$

b)

$$7 - 4\sqrt{3}$$

c)

$$21 - 12\sqrt{3}$$

d)

$$21 - 4\sqrt{3}$$

**Q22. DIRECTIONS** for questions 21 and 22: Select the correct alternative from the given choices.

How many words can be written using all the letters of the word EDUCATION, such that only two of the vowels are together and none of the other vowels are together?

a) 57600

b) 115200

c) 460800

d) 508400

**Q23. DIRECTIONS** for question 23: The question below is followed by two statements, I and II. Answer the question using the following instructions:  
If the 1st of this month was a Sunday, what day of the week was the first day of this year?

1. The 1st of the next month is a Wednesday.

2. The 1st of the previous month was a Saturday.

a) if the question can be answered by any one of the two statements alone but not by the other statement alone.

b) if the question can be answered by either of the two statements alone.

c) if the question can be answered only if both the statements are taken together.

d) if the question cannot be answered even if both the statements are taken together.

**Q24. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

If  $a$  is a real number,  $a^-$  is defined as the greatest integer less than or equal to  $a$  and  $a^+$  is defined as the least integer greater than or equal to  $a$ . The four values  $P$ ,  $Q$ ,  $R$  and  $S$  are defined for two real numbers  $m$  and  $n$  in the following manner.

$$P = m^- + n^- + (m + n)^-$$

$$Q = (2m)^- + (2n)^-$$

$$R = m^+ + n^+ + (m + n)^+$$

$$S = (2m)^+ + (2n)^+$$

Which of the following cannot be true?

- a)  $R > S$
- b)  $R = S$
- c)  $P = Q$
- d)  $P > Q$

**Q25. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

A regular polygon has an even number of sides. If the product of the length of its side and the distance between two opposite sides is  $\frac{1}{4}$ th of its area, find the number of sides it has.

- a) 6
- b) 8
- c) 20
- d) 16

**Q26. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

In how many ways can twelve similar balls be divided into three groups, with each group containing at most six balls?

- a) 11
- b) 6
- c) 12
- d) None of the above

**Q27. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

Amit is standing on the ground and looking at the top of a pole. He observes that the angle of elevation of the top of the pole is  $30^\circ$ . He then walked a distance of  $30\sqrt{3}$  meters in a straight line on the ground and, from his new position, found the angle of elevation of the top of the pole to be  $60^\circ$ . Ignoring Amit's height, find the minimum possible height of the pole.

- a) 45 m
- b) 33.5 m
- c)  $9\sqrt{10}$  m
- d) 22.5 m

**Q28. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

A and B can finish a work, working on alternate days, in 17 days, where A works on the first day. Similarly, they can finish the work, working on

alternate days, in  $17\frac{2}{3}$  days, where B works on the first day. If C, working alone, can complete the work in 35 days, in how many days can the work be completed when A, B and C work together?

- a) 6 days
- b) 7 days
- c)  $7\frac{2}{5}$  days
- d)  $6\frac{2}{5}$  days

**Q29. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

In a triangle PQR, PQ = 9 cm, QR = 12 cm and RP = 15 cm. A perpendicular dropped from Q, meets the side RP at S. A circle of radius QS (with centre Q) is drawn. If the circle cuts PQ and QR at T and U respectively then PT : RU is equal to

- a) 3 : 7.
- b) 3 : 8.
- c) 3 : 5.
- d) 4 : 7.

**Q30. DIRECTIONS** for questions 24 to 30: Select the correct alternative from the given choices.

Our class of 36 students needs to practice for the drill on our annual day. For this, we arrange ourselves into six equal rows and columns, all of us facing the stage. In each row, the students wear dresses of exactly two different colours, with no two adjacent students of a row wearing a dress of the same colour. If dresses of exactly six different colours are available, find the total number of ways in which the colours of the dresses can be chosen, such that the colour of the dress of any student in any row is not the same as that of any other student in an adjacent row?

- a) 15!
- b)  $15 \times 65$
- c)  $15 \times 125$
- d)  $30 \times 125$

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

$N$  is a natural number greater than 1.  $A$  and  $B$  are single-digit natural numbers, with  $A \geq B$ , such that for any value of  $N$ ,  $(A + B)N$  has the same units digit as  $A + B$  and  $(A \times B)N$  has the same units digit as  $(A \times B)$ . How many pairs of values of  $A$  and  $B$  exist satisfying these conditions?

**Q32. DIRECTIONS** for questions 32 to 34: Select the correct alternative from the given choices.

The number of distinct triangles with integral valued sides and with perimeter 16 units is

- a) 3.
- b) 5.
- c) 4.
- d) 8.

**Q33. DIRECTIONS** for questions 32 to 34: Select the correct alternative from the given choices.

If  $a$ ,  $b$  and  $c$  are positive numbers satisfying  $a^2 + b^2 + c^2 = 12$ , then which of the following is true of the sum  $S = a + b + c$ ?

- a)  $S$  is at least 6
- b)  $S$  is at most 6
- c)  $S$  is at least 12
- d) None of these

**Q34. DIRECTIONS** for questions 32 to 34: Select the correct alternative from the given choices.

Find the area (in sq. units) of the quadrilateral formed by the straight lines  $y = -6$  and  $y = 2x + 4$ , and the negative co-ordinate axes.

- a) 28
- b) 21
- c) 35
- d) 42

