VARC

DIRECTIONS *for questions 1 to 3:* The passage given below is followed by a set of three questions. Choose the best answer to each question.

Every morning, designers wake up to happily work on their products, be they digital or physical, with an inner belief that people will want to use their products and will have a blast doing so.
Here is a little revelation. People are not really into using products. Any time spent by a user operating an interface, twisting knobs, pulling levers or tapping buttons is time wasted. Rather, people are more interested in the end result and in obtaining that result in the quickest, least intrusive and most efficient manner possible.
I still find a lot of products today, be they digital or physical, to be too complex and feature-driven**.** Shouldn't we as designers instead be looking to remove complexity for users as much as possible or as much as allowed for by current technology, by making our products fit more seamlessly into their daily lives and routines? …
If we go back some 15 to 20 years ago, web design was all about visual design. Older readers will recall the days of 2Advanced Studios and other similar blockbuster websites. They were gorgeous, with amazing Flash animation and carefully crafted images and pixels. If we were to look back at these websites today through the filter of modern design, though, we could say for certain that the experience at that time was less than desirable.
… These websites were essentially crafted to be admired; they were pieces of art, and the actual benefit to the user, the result, was secondary, if that.
Perhaps in those early days we didn't know any better because we humans rarely learn from other fields, and we are terrible at translating knowledge learned in one field to another. No studies or best practices for the web were available, but over time, as digital design has grown (encompassing interaction, visual, interface and motion design), we have come to the realization that the less time a user spends on a website – especially a tool or service – the better.
Who would have thought in the early days of Google Search that Google would want to shave milliseconds from the search process so that users could get away from Google as quickly as possible. Google was among the first digital companies to realize, or simply to inherit knowledge from other industries at the time, that time spent with the product itself was wasted time and that the quickest route to the result is the best way to design.

Q1. Which of the following is a characteristic of the blockbuster websites created 15 to 20 years ago?

a) These websites had a large number of buttons and controls.
b) These websites were created to be visually appealing even at the expense of functionality.
c) These websites did not provide any benefit to the users of the website.
d) These websites are too complex and feature-driven.

Q2. What does the author imply when he states that "we humans rarely learn from other fields"?

a) There was very little interaction between experts from different fields in the early days.

b) Best practices available for web designing was not used in other industries.
c) Even though we knew that a user wanted to spend more time using an aesthetically appealing product, we did not use this knowledge in web design.
d) We already knew that users wanted to spend as little time as possible with products but did not use this knowledge in web design.

Q3. Which of the following websites will the author consider to be an example of good design?

a) A website having a lot of options in the form of buttons, knobs and levers.
b) A website being visually appealing.
c) A website providing immediate results.
d) A website which is built using insights borrowed from other industries.

DIRECTIONS *for questions 4 to 6:* The passage given below is followed by a set of three questions. Choose the best answer to each question.

Worrying news for people in developed countries who will be born in 2030. A new study suggests their life expectancy will exceed 90. Only last year the World Health Organisation told us that, globally, "babies born in 2015 [could] expect to live to 71.4 years", so that's quite a jump we see here.

I dread to think what next year's estimate will be, because life in your 90s is not always much fun. My mother lived to 98. It was difficult and frustrating for her from 90 to 95, losing her independence, and hellish after her stroke in her mid-90s – by which time she was longing to die, often begging me and the hospital consultants to finish her off. "We can't help you with that, I'm afraid," said one consultant, and I had to look the other way and have a little cry.

But my mother's despair was understandable. Because, as the WHO pointed out last year, that "healthy life expectancy falls a good deal short of life expectancy". And that's the big problem. It would be lovely to live into your 90s if you were fit and healthy, could live free of discomfort, and carry on doing the things you loved – dancing, cooking, chatting, getting about – but you usually can't.

Life is not much fun if, like my mother and her peers, you can barely move or talk, everything hurts, you're terrified of incontinence and dementia, you feel like a useless burden, and most of your friends are dead. Or if they're still around, you can't get to see them. Who's going to take you to meet your remaining old chums and look after you?...

I would laugh if it wasn't so serious. In the UK, our health and social care setups are going down the pan already. What state are they going to be in after 2030? I imagine 70- and 80-year-old children tottering around caring for their ancient parents. Unless they're still working, because who can afford to be retired for 25-30 years?

I am frightened of death, but becoming almost more frightened of living to a very old age in this country. But perhaps I won't have to. There are always caveats to these reports: climate change, natural disasters, new and uncontrollable diseases or gigantic wars may wipe out millions of us. I don't like to sound too dismal, but I no longer know which is the worse option.

Q4. The author feels that life expectancy exceeding 90 years is "worrying news for people in developed countries who will be born in 2030" because

a) of the lack of the social care systems in the developed world.

b) a nonagenarian can most probably not lead a healthy life.
c) after reaching 90 years, the person becomes a useless burden.
d) a person above 90 years of age will not be taken care of.

Q5. As can be inferred from the fifth paragraph of the passage, which of the following problems will a person whose age is over 90 years most probably face?

a) The children of such persons will be retired and will not be able to take care of their parents.
b) The children of the persons over 90 years of age will be unwilling to take care of their parents.
c) The persons who are over 90 years of age will have to depend on their children as they get older.
d) The persons who are over 90 years of age will have children who are themselves very old.

Q6. Which of the following options does the author consider when he states that "I no longer know which is the worse option"?
I. Living to a very old age in the UK.
II. The author dying before he gets old.
III. Reduction in life expectancy due to a global catastrophe.
IV. Moving to a developing country from the UK.

a) I and II
b) II and III
c) I and III
d) III and IV

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

The practice of alchemy combined the studies of metallurgy and chemical processes through laboratory experimentation with the studies of medicine and disease and mysticism, religion, and philosophy. The most well-known aim of alchemy was to find a technique through which the alchemist could transmute base metals like lead into gold. For some alchemists "the great work" was less about the prosaic transformation of materials than about a higher transformation of one's soul: to leave baser human foibles behind for spiritual enlightenment. The vehicle by which either transmutation would occur was the production of the Philosopher's Stone. Small portions of this material added to lead were said to change it into gold. Taken internally, the Philosopher's Stone would act as an elixir of life.
The common popular view of alchemy, its practitioners, and place of practice is that of Renaissance Europe. The practice of something akin to alchemy can be traced back to ancient Babylon. ... The Greek mania for simplifying the universe so it could be better understood led to the creation of the four elements concept. The Greeks visualized the world around a diagram listing air, fire, earth, and water as the four basic building blocks of the universe. The entire universe, they believed, was made up of combinations of these four elements and their corresponding conditions (hot, dry, cold, and wet). The logic behind this arrangement suggested that, if all matter was made of these four simple elements, it would be relatively easy to change one bit of matter into another by simply

re-arranging the recipe by which they were combined. With that, the popular concept of alchemy was born.
Two of the most famous Islamic alchemists were Al Jabir ibn Hayyan (722-815) and Al Razi (866-925). Jabir, known to his later Christian admirers as Geber, created a number of alchemical apparatus – such as the distillation flask, alembic, and test tubes – that became standard equipment in any alchemical laboratory. ...
The golden age of alchemy was from the late Medieval through renaissance periods of European history. Renaissance magi came to believe that the originator of alchemy was Hermes Trismigistus (thrice great Hermes), a composite of Greco-Roman deities. As a result, an entire body of knowledge, not all of which was alchemical, was developed based upon the writings attributed to this character and called the *Hermetica*. The first alchemical book to reach Europe was a translation by Englishman Robert of Chester called *The Book of the Composition of Alchemy. ...* Most modern scientific chemical processes can find their origins in alchemical research. Alchemy also had a role in the growth of modern medicine and the pharmaceutical industry. Alchemy was seen not as a way to produce silver and gold to make one rich, but as a means of producing medicines to make one healthy. It is persuasively argued by historians that alchemical research helped pave the way for later understandings of the universe and was a pivotal intellectual part of the Scientific Revolution. ... The modern reappraisal of alchemy, and its resurrection as a worthwhile topic of historical study, came in the late 1970s with the publication of Belgian historian of science Robert Halleux's *Les Textes Alchemique*. He saw the work of some alchemists as organized and experimental and thus forming the basis of modern experimental science.
The origins of chemistry have been linked to the history of alchemy in popular as well as scholarly texts. The traditional view is that alchemy was a strange, irrational fringe pursuit and that chemistry, as a logical practice, evolved out of it almost accidentally. This view has been repudiated by the scholarship of Lawrence Principe and William Newman. Their close reading and analysis of original texts and primary sources shows that there was no differentiation between alchemy and chemistry to the practitioners of the field prior to about 1700. Principe and Newman suggest using the term *chymistry* to label the interwoven nature of these two historical pursuits. After the early part of the 16th century, however, a division between the two practices did appear, with alchemy veering off into the more spiritual and metaphysical aspect of the endeavor (including the transmutation of metals) and chemistry moving toward its modern form as a non-metaphysical science of materials and atomic structure. As such, *chymistry* was the foundation of the modern pharmaceutical and metallurgical industries and contributed to modern laboratory techniques of a number of sciences. The transmutation aspect can even be seen as an early step toward biological evolution theory.

Q7. The practice of alchemy or something alike can be traced back to which of the following countries/ civilizations?

a) Greece
b) Babylon
c) Egypt
d) India

Q8. Which of the following apparatus did the Islamic alchemist nicknamed Geber not create?

a) Test tubes
b) Alembic
c) Crystallization flasks and crucibles
d) Distillation flasks

Q9. According to the passage, which of the following was not believed to be the aim of alchemy?
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) Transformation of base metals into gold.
(2) Spiritual enlightenment by soul transformation.
(3) Development of a method to understand the universe.
(4) Creation of a subject called Chemistry.
(5) Produce medicines to make one healthy or to cure a person.

Q10. What is the importance of the Philosopher's Stone, according to the passage?

a) The discovery of the Philosopher's Stone led to the emergence of a separate field called chemistry.
b) The Philosopher's Stone would act as an elixir of life.
c) The Philosopher's Stone was the vehicle through which human weaknesses could be converted into spiritual strengths.
d) The Philosopher's Stone was used commonly in disciplines like medicine and chemistry.

Q11. According to the passage, which of the following does not accurately explain a difference between alchemy and chemistry?

a) Alchemy is a rational pursuit whereas chemistry is a strange illogical practice that evolved accidentally.
b) Alchemy was a strange, irrational endeavour and chemistry was a logical practice.
c) Alchemy involved metaphysical aspects of science including metal transformation while chemistry did not involve metaphysical aspects.
d) None of these.

Q12. Which of the following books do not find a mention in the passage?

a) Les Textes Alchemique
b) Hermetica
c) The book of the Composition of Alchemy
d) Turba Philosophorum

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

A few weeks ago, in reaction to something I had written about blackness and whiteness in recent movies, I received a note from a reader. “Since when is everything about race?” he wanted to know. Perhaps it was a rhetorical question.

A flippant – though by no means inaccurate – answer would have been 1619. A more constructive response might have been to recommend Raoul Peck’s life-altering new documentary, “I Am Not Your Negro.” Whatever you think about the past and future of what used to be called “race relations” – white supremacy and the resistance to it – this movie will make you think again. You would be hard-pressed to find a movie that speaks to the present moment with greater clarity, insisting on drawing stark lessons from the shadows of history.

There is a thrilling communion in the documentary between the filmmaker – whose previous work includes a documentary about Patrice Lumumba – and his subject James Baldwin, now dead for thirty years. The voice-over narration (read by Samuel L. Jackson) is entirely drawn from Baldwin’s work. Much of it comes from notes and letters written in the mid-1970s, when Baldwin was somewhat reluctantly sketching out a book, never to be completed, about the lives and deaths of Medgar Evers, Malcolm X and Martin Luther King Jr. Reflections on **those** men (all of whom Baldwin knew) and their legacies are interspersed in the film with passages from other sources. ...

A former child preacher, Baldwin could not have known about Ferguson and Black Lives Matter, about the presidency of Barack Obama and the revival of white nationalism in its wake, but in a sense he explained it all in advance. He understood the deep, contradictory patterns of our history, and articulated, with a passion and clarity that few others have matched, the psychological dimensions of racial conflict. ...

Baldwin was a performer – a master of the heavy sigh, the raised eyebrow and the rhetorical flourish. At one point, on “The Dick Cavett Show,” Baldwin tangles with Paul Weiss, a Yale philosophy professor who scolds him for dwelling so much on racial issues. The initial spectacle of mediocrity condescending to genius is painful, but the subsequent triumph of self-taught brilliance over credentialed ignorance is thrilling to witness.

In that exchange, you are aware of Baldwin’s profound weariness. He must explain himself – and also his country – again and again, with what must have been sorely tested patience. You glimpse an aspect of his personality that was often evident in his writing: the vulnerable, bright, ambitious man thrust into a public role that was not always comfortable. “I want to be an honest man and a good writer,” he wrote. The disarming, intimate candor of that statement characterized much of what would follow, as would a reckoning with the difficulties of living up to such apparently straightforward aspirations.

“I Am Not Your Negro” reproduces and redoubles this effect. It doesn’t just make you aware of Baldwin, or hold him up as a figure to be admired from a distance. You feel entirely in his presence, hanging on his every word, following the implications of his ideas as they travel from his experience to yours. At the end of the movie, you are convinced that you know him. And, more important, that he knows you.

Recounting his visits to the South, where he reported on the civil rights movement and the murderous white response to it, Baldwin modestly described himself as a witness, a watchful presence on the sidelines of tragedy and heroism; an outsider by virtue of his Northern origins and his alienation from the Christianity of his childhood. But he was also a prophet, able to see the truths revealed by the contingent, complicated actions of ordinary people on both sides of the conflict. This is not to say that he transcended the struggle or detached himself from it. He demonstrated that writing and thinking clearly are manifestations of commitment, and that a ruthless critical spirit is necessary for moral and political action.

“I Am Not Your Negro” is a thrilling introduction to his work, a remedial course in American history, and an advanced seminar in racial politics – a concise, roughly 90-minute movie with the scope and impact of a 10-hour mini-series or a literary doorstop. ... “I can’t be a pessimist because I’m alive,” Baldwin had said. “I’m forced to be an optimist.”

Q13. Whom does the pronoun ‘those’ in the last sentence of para 3 refer to?
Identify all that apply and enter the corresponding number in the input box given below. You must enter your answer in increasing order only. For example, if you think (1) and (2) apply, then enter 12 (but not 21) in the input box.
(1) Medgar Evers
(2) Samuel L. Jackson
(3) Martin Luther King Jr
(4) Patrice Lumumba
(5) Malcolm X

Q14. Which of the following choices correctly depicts characteristics of James Baldwin as can be inferred from the passage?

a) He came across as brilliant and resilient without thinking too much of the future.
b) He had deep and relatively unparalleled insight about the psychological aspects of racial conflict.
c) He enjoyed public attention at all times and was able to live upto self-imposed standards of patience, honesty and morality.
d) He had a predilection for Christian values even in his forties.

Q15. What does the author imply when he says “A flippant – though by no means inaccurate – answer would have been 1619." (para 2)?

a) The answer of 1619 is inaccurate with respect to the context.
b) The answer of 1619 was not convincing enough for the audience.
c) Although the answer of 1619 is not wrong, a better response could be a biopic of a black man's chequered life.
d) The reader who posed the rhetorical question had an insouciant attitude towards 'race'.

Q16. What can be inferred from the statement "Baldwin could not have known about Ferguson and Black Lives Matter ....." (para 4)?

a) Baldwin did not meet Ferguson during his lifetime and could not be associated with Black Lives Matter even though he wanted to.
b) Baldwin only had a few popular friends like Medgar Evers, Malcolm and Martin Luther King and he did not know Barack Obama quite well.
c) Since Baldwin was more interested in topics related to race and the revival of white nationalism, he was able to foresee 'Ferguson', 'Black Lives Matter' and the presidency of Barack Obama.
d) Baldwin died before the presidency of Barack Obama and the popularization of Ferguson and Black Lives Matter.

Q17. What is the final conclusion of the author in this passage?

a) The documentary "I am not your Negro" is worth the time spent.
b) The documentary is a good answer for the question from an anonymous reader.
c) Baldwin was always an optimist throughout his life.
d) Baldwin's writings clearly described the present moment or situation with utmost clarity.

Q18. What can be inferred from the sentence "This is not to say that he transcended ....." (para 8)?

a) Baldwin did not experience the struggle of ordinary people.
b) Baldwin understood both sides of the conflict although he was not actively a part of it.
c) Irony, skepticism and a ruthless critical spirit are necessary tools for effective moral and political action.
d) Baldwin's alienation from the Christianity of his childhood was clearly evident in his writings.

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.

When comparing ourselves versus other people, we tend to rate ourselves more highly on a host of positive measures, including intelligence, ambition, friendliness, and modesty. This self-enhancement effect is most profound for moral characteristics. While we generally cast ourselves in a positive light relative to our peers, we believe that we are more moral than others. This self-righteousness is destructive because it reduces our willingness to cooperate or compromise, creates distance between ourselves and others, and can lead to intolerance or even violence. ...

Ben Tappin and Ryan McKay wondered why people strongly believe they are moral, yet simultaneously regard the average person as significantly less so. They conducted a study in which participants considered 30 character traits, including traits associated with morality (e.g., sincerity), sociability (e.g., warmth), and agency (e.g., competence). Participants rated the extent to which each trait described themselves, described the average person, and was socially desirable. They worked out how irrational it was for people to think of themselves as better than average in each of these categories.

How did they determine how rational people were being? Well, some degree of self-enhancement is actually rational. When we make judgments about ourselves and others, we have far more information about our own actions and behaviors than we do about the average person and we are more cautious in our evaluations of others relative to ourselves.

The key to estimating the rational component of self-enhancement is understanding how an individual might infer the characteristics of others. To do this, Tappin and McKay adapted the Social Projection Index (SPI). This measure recognizes that statistically, most people are in the majority most of the time, so to make accurate judgments about others we should, to some extent, project what we know about ourselves. Of course the extent of that projection will vary: it depends on how unusual a person truly is. People are rational when they accurately perceive how similar they are to the average person, and make use of that.

To illustrate, consider the following example. Let’s say Jane’s ratings of herself are very similar to the average of the self-ratings made by others. She is fairly typical. In her case, it would be rational for her to assume that others have similar ratings to her own. And, conversely, it would be irrational for her to assume that she is better than others. Let’s say that Jack, on the other hand, rates himself in ways that are atypical of the average of the

self-ratings made by others. He is objectively unusual. In his case, it would be more rational for him to assume that he is better than others in some way.
Of course one challenge in making rational self-evaluations is knowing how typical (or atypical) you truly are. Tappin and McKay were able to measure individuals' typicality more precisely using the responses from their experiment. First, they calculated the profile of the "typical Joe" by averaging the self-evaluation ratings for all participants. Then, for each participant, they evaluated the extent to which individual self-ratings aligned with those of the "typical Joe," a measure known as the "coefficient of similarity." Those with a high coefficient of similarity (like Jane) would be expected to have similar ratings for self and others, while those with a low coefficient of similarity (like Jack) would be expected to have less similar ratings for self and others. For each participant, Tappin and McKay used the coefficient of similarity to compute inferred self-judgments – how participants should have rated themselves if their ratings were rational.
Tappin and McKay not only considered the discrepancy between actual self-ratings and inferred self-ratings; they also considered the extent to which these ratings were differentially affected by trait desirability. Irrational thinking is revealed when trait desirability more accurately predicts actual self-ratings than inferred self-ratings. In other words, you are irrational when you consider a trait highly appealing, and you let that appeal influence your self-ratings in such a way that you distort the similarity between yourself and others.
Tappin and McKay found that the irrational component of the self-enhancement effect was greater for morality traits than either agency or sociability traits. Participants were least likely to accurately use their self-judgments in projecting other-judgments when considering morality traits, and trait desirability predicted actual self-judgments of morality to a much greater extent than it predicted inferred self-judgments of morality.
... What are the consequences of irrationally believing ourselves to be more moral than others? Feelings of moral superiority could, in theory, protect our well-being but they could erode our own ethical behavior. Evidence from related studies suggests that self-perceptions of morality may "license" future immoral actions. When our moral self-image is well-established (either through actions or the self-enhancement effect), we may feel less obligated to follow a strict ethical code.

Q19. Which of the following choices can complete the last paragraph of the passage?

a) Therefore, it is bad to consider ourselves superior to others.
b) This is the reason that political discord, social conflict, and even terrorism in our country is on the rise.
c) Thus, the fact that we tend to believe that we are above the moral average could ironically makes us less so.
d) Thus, a feeling of moral superiority will lead to people following lenient ethical codes.

Q20. Which of the following is/are not (an) example(s) of the "self-enhancement effect" that the passage explains?
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) One considers oneself to be more intelligent.

(2) A thought or opinion that some people are more modest than others.
(3) A feeling of one being friendlier than others.
(4) A feeling of one's greater competence or creativity compared to others.
(5) In a particular town, all the women are strong, all the men are handsome, and all the children are above average.

Q21. According to the passage, why did Tappin and McKay adapt the Social Projection Index?

a) To find out about the characteristics of different kinds of people in their experiment.
b) To determine the extent of rationality present when people judge the characteristics of others.
c) To find out how many people (participating in the experiment) know about other people's qualities.
d) To prove that we have far more information about our actions and behaviours than we do about the average person.

Q22. All of the following can be inferred from the Jack and Jane example used in the passage EXCEPT?

a) If you are very similar to other people, your ratings of others should be similar to how you rate yourself.
b) If you are truly different from other people, you can be more justified in giving others different ratings than you give yourself.
c) You are able to determine how typical you truly are but not how atypical you are.
d) The extent of projection of what you know about yourself depends on how unusual you are.

Q23. How has the idea of a "typical Joe" helped the two researchers in their experiment?

a) It explains the extent to which the quality of desirability affects one's thinking.
b) It emphasizes the extent of similarity among the people in the experiment.
c) It stresses the extent of rationality in one's self-evaluation ratings.
d) It helps pinpoint the extent to which individual ratings matched the average self-evaluation ratings.

Q24. Which of the following is the correct finding of Tappin and Mc Kay's experiment?

a) We are most irrational when we consider moral traits.
b) The coefficient of similarity is not an important component in self-rating.
c) There is a discrepancy between actual self-ratings and inferred self-ratings.
d) Trait desirability predicted inferred self-judgments of morality to a much greater extent than it predicted actual self-judgments of morality.

Q25. DIRECTIONS *for questions 25 to 29:* 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 answer for the question given below the five sentences.

1. Last year Japan lowered the voting age from 20 to 18.
2. Now, Minami is not in her twenties but she is a high-schooler from Tokyo.
3. The upcoming election will probably not change their views.
4. But Minami does not plan to vote in an election for the upper house of the Diet, or parliament, on July 10th.
5. Like many Japanese, she finds politics dull.

Q26. DIRECTIONS *for questions 25 to 29:* 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 answer for the question given below the five sentences.

1. If a million teenagers had been given the same opportunity, how many more Microsofts would we have today?
2. We are so caught in the myths of the best and the brightest and the self-made that we think outliers spring naturally from the earth.
3. Hence, to build a better world we need to replace the patchwork of lucky breaks and arbitrary advantages that today determine success.
4. At the outset, I would like to say that the lesson here is very simple.
5. We look at the young Bill Gates and marvel that our world allowed that thirteen-year-old unlimited access to a time sharing terminal in 1968.

Q27. DIRECTIONS *for questions 25 to 29:* 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 answer for the question given below the five sentences.

1. If the cause is a blocked artery, blood flow can often be restored using clot-busting drugs.
2. When dealing with a stroke – loss of blood supply to the brain – time is of the essence.
3. This is called a “reperfusion” injury.
4. In one of nature’s crueller ironies, the metabolic changes that take place in cells after about three hours without oxygen or glucose mean that restoring blood flow becomes damaging in itself.
5. If those drugs are swallowed too late, however, they can do more harm than good.

Q28. DIRECTIONS *for questions 25 to 29:* 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 answer for the question given below the five sentences.

1. Each week they match wits with a special invited guest and a million dollars is at stake.
2. And by that standard, few have ever seemed as superbly qualified as Christopher Langan, who many call the smartest man in America and who has an IQ of one ninety-five.
3. The guest has to be smart enough to answer more questions correctly than his or her hundred adversaries.

4. It features a permanent gallery of one hundred ordinary people who serve as what is called “the mob”.
5. The television show 1 vs. 100 is one of many that sprang up in the wake of the phenomenal success of *Who Wants to Be a Millionaire?*

Q29. DIRECTIONS *for questions 25 to 29:* 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 answer for the question given below the five sentences.

1. It would be pollyannish to suggest that workers in industry or government today truly "participate" in the management of their enterprises.
2. "The central, crucial and important business of organizations," he declares, "is increasingly shifting from up and down to 'sideways'" and there is a virtual revolution in organizational structure – and human relations.
3. Yet there is evidence that bureaucratic hierarchies, separating those who "make decisions" from those who merely carry them out, are being altered, side-stepped or broken.
4. For people communicating "sideways" – i.e., to others at approximately the same level of organization – behave differently, operate under very different pressures, than those who must communicate up and down a hierarchy.
5. This process is noticeable in industry where "irresistible pressures" are battering hierarchical arrangements.

Q30. DIRECTIONS *for questions 30 to 32:* 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. Recent research has, however, shown there is much more going on as far as the clownfish is concerned.
2. Some fish species are known to wave their fins over their coral homes to help keep the coral oxygenated.
3. A new study in 2015 revealed that waste excreted by clownfish provides vital nutrients to anemones.
4. It is one of the best-known relationships in nature: the anemone provides a tentacle-guarded home and the clownfish drives off predators that would chew its protector.
5. Now researchers have found that clownfish can boost their hosts’ oxygen supplies at night too.

Q31. DIRECTIONS *for questions 30 to 32:* 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 few contemporary poets regard rock lyrics with anything close to critical admiration; though Paul Muldoon may be the exception to this rule.
2. Some rock musicians have been known to write poetry.
3. Two things ensure that his collection does not read like a pastiche of a rock album.
4. The music of Bob Dylan and Patti Smith, to take two examples, owes much to Arthur Rimbaud, a 19th-century French poet.

5. Others have even looked to poets for inspiration.

Q32. DIRECTIONS *for questions 30 to 32:* 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. Those with academic inclinations took extra classes with the head teacher in their teenage years and with luck made it into teachers' college.
2. Formal schooling – if you could call what happened in the wooden barn next door to my grandparents' house "formal schooling" – went only to fourteen years of age.
3. Those with broader ambitions had to somehow find their way into a private school, and from there to a university in the United States or England.
4. But given what we are learning about intelligence, the idea that schools and universities can be ranked, like runners in a race, makes no sense.
5. Chief among MacMillan's concerns was Jamaica's educational system – Jamaica had no public high schools or universities.

Q33. DIRECTIONS *for questions 33 and 34:* In each of the following questions, there are sentences or fragments of sentences that form a paragraph. Identify the sentence(s) or fragments of sentence(s) that is/ are correct in terms of grammar and usage, including spelling, punctuation and logical consistency. Enter the number corresponding to the sentence(s) or fragments of sentence(s) in the input box provided below the question. [Note: Enter your answer in increasing order only. For example, if you think that the fragments (2) and (4) are correct, then enter 24 (but not 42) in the input box.]

1. The amaranth flower is praised both in Aesop's fables as well as John Milton's "Paradise Lost" for its everlasting qualities.
2. In the eyes of Nick Maounis, a bond trader, that made it a good name for the hedge fund he set out in 2000.
3. Six years later, Amaranth Advisors looked an astonishing success, with stellar investment record and assets under management of more than $9 billion.
4. But by the end of the year, the group had been consigned to the compost heap. The story of its collapse is entertainingly told
5. in "Hedge Hogs" by Barbara Dreyfuss. It is a tale of hubris and nemesis, of traders who forgot about risk in the pursuit for reward.

Q34. DIRECTIONS *for questions 33 and 34:* In each of the following questions, there are sentences or fragments of sentences that form a paragraph. Identify the sentence(s) or fragments of sentence(s) that is/ are correct in terms of grammar and usage, including spelling, punctuation and logical consistency. Enter the number corresponding to the sentence(s) or fragments of sentence(s) in the input box provided below the question. [Note: Enter your answer in increasing order only. For example, if you think that the fragments (2) and (4) are correct, then enter 24 (but not 42) in the input box.]

1. It's fair to say that Christopher Nolan has been one of the most influential directors of the new millennium.
2. Nolan's films – *Memento, Dark Knight trilogy, Inception, Interstellar* – have been almost so much of a cultural talking point as the enigmatic director himself.
3. That prominence in the zeitgeist combined with the mystery surrounding the man and his method have ballooned Nolan

4. to almost mythic status amongst film fans. Curiosity and excitement for any project bearing his name are automatic guarantee,

5. to the point that criticism of his work (or technique) can be met with irrational levels of contention almost.

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

Mr. Kingsley, the owner of a resort, was studying the details of the persons who stayed at his resort during the month of April. He found that fifteen persons stayed at his resort between 1st April and 30th April. The table below provides the date on which each person arrived at the resort and the date on which he/she left. Any person who arrived at the resort on any day did so at the beginning of the day and any person who left the resort on any day did so at the end of that day. It is known that any pair of persons who stayed at the resort together for at least one day definitely met each other.

Name	Arrived on	Left on
Ajay	16th April	25th April
Akash	5th April	18th April
Bob	11th April	15th April
Lohit	2nd April	9th April
Kalyan	25th April	30th April
Pavan	6th April	14th April
Omar	10th April	15th April
Ratan	9th April	19th April
Rajesh	17th April	23rd April
Harish	4th April	13th April
Jai	12th April	21st April
Jeeva	23rd April	29th April
Manu	20th April	27th April
Minnie	3rd April	12th April
Wasim	1st April	7th April

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

On which day during the month of April did the highest number of persons stay at the resort?

a) 10th April
b) 11th April
c) 12th April
d) None of the above

Q2. DIRECTIONS *for questions 1 to 3:* Select the correct alternative from the given choices.
Who among the following would have met the highest number of persons at the resort?

a) Lohit
b) Pavan
c) Harish
d) Ratan

Q3. DIRECTIONS *for questions 1 to 3:* Select the correct alternative from the given choices.
What is the average number of persons at the resort per day during the given period?

a) 4.1667
b) 4.2667
c) 4.3667
d) 4.4667

Q4. DIRECTIONS *for question 4:* Type in your answer in the input box provided below the question.
Among the persons that Manu met at the resort, the maximum number of days that any person stayed in the resort was

DIRECTIONS *for questions 5 to 8:* Answer these questions on the basis of the information given below.
Six children – Jack, James, Jerry, Jim, John and Jude – were in a play and each child played a different object among a tree, the sun, the moon, a river, a rock and a flower. During the play, the children stood in a line from East to West, all facing North. The following information is known about their positions and their parts:

1. Jim, who stood adjacent to the child who played the sun, stood two places to the right of Jerry.
2. The child who played a rock stood four places to the right of the child who played a river.
3. Jack, who did not stand at any of the ends, stood adjacent to the child who played a flower, while Jim did not stand at the extreme right.
4. Jude played a tree, while Jerry did not play a river.
5. The child who played a rock was standing adjacent to James, who played the sun but was not standing at either end

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

a) John
b) Jerry
c) **Jim**
d) Jack

Q6. DIRECTIONS *for questions 5 to 8:* Select the correct alternative from the given choices.
Who stood two places to the right of the child who played a river?

a) Jerry
b) Jack
c) Jude
d) **Jim**

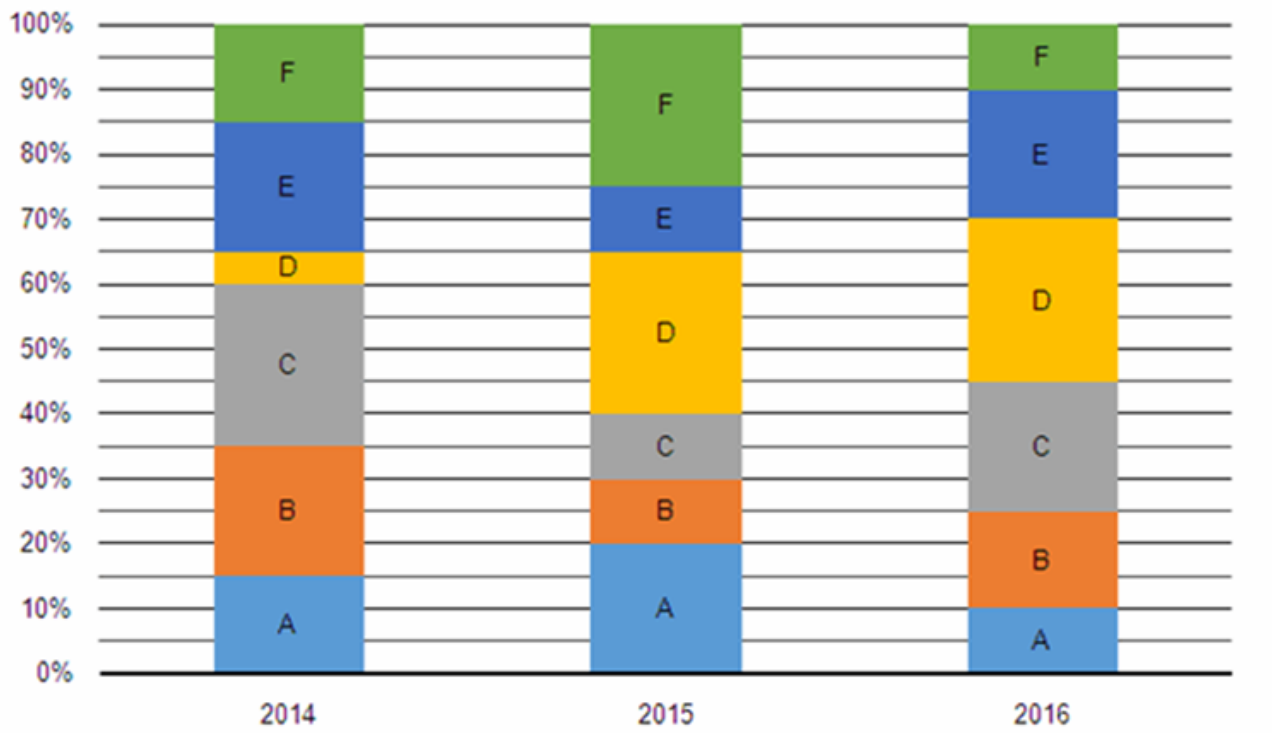
Q7. DIRECTIONS *for questions 5 to 8:* Select the correct alternative from the given choices.
The child who stood at the extreme right played

a) a river
b) a rock.
c) a tree.
d) the moon.

Q8. DIRECTIONS *for questions 5 to 8:* Select the correct alternative from the given choices.
Who among the following stood adjacent to the child who played the moon?

a) Jim
b) Jerry
c) James
d) Jude

DIRECTIONS *for questions 9 to 12:* Answer these questions on the basis of the information given below.
Six companies – A through F – sell packaged drinking water in a city. The bar graph below gives the percentage market share by revenue of each of the six companies, for each of three years, 2014, 2015 and 2016. It is also known that the revenue earned by the six companies combined increased by 10% in 2015, as compared to the previous year, and decreased by 15% in 2016, as compared to the previous year.



Q9. DIRECTIONS *for questions 9 to 12:* Select the correct alternative from the given choices.
What is the total revenue earned by A in 2015, if the difference between the revenue of E in 2016 and the revenue of C in 2014 is Rs.45 mn?

a) Rs.22.5 mn
b) Rs.33 mn
c) Rs.45 mn
d) Rs.40 mn

Q10. DIRECTIONS *for questions 9 to 12:* Select the correct alternative from the given choices.
For how many companies was the revenue of the company in 2016 less than that in 2014?

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

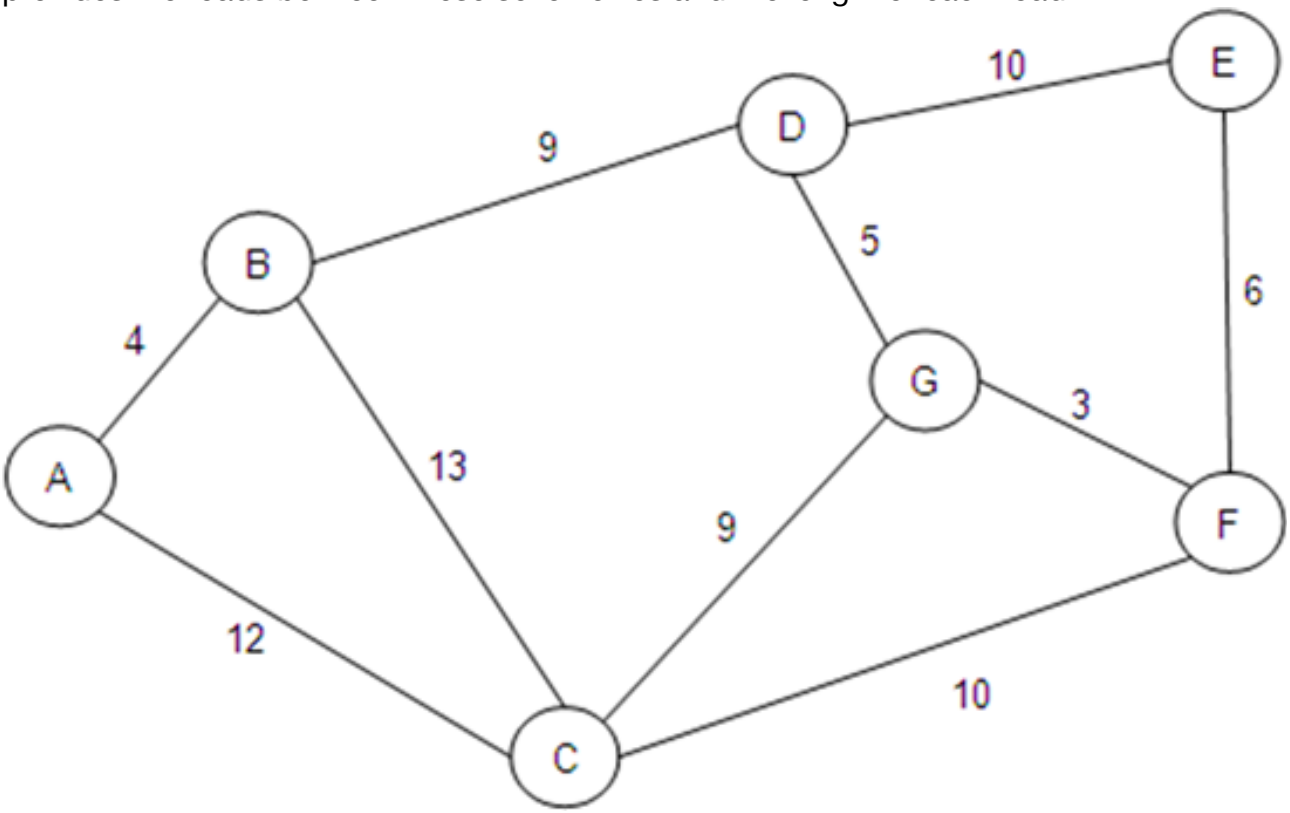
Q11. DIRECTIONS *for questions 9 to 12:* Select the correct alternative from the given choices.
Across the three years combined, which company earned the highest revenue?

a) B
b) **E**
c) **C**
d) D

Q12. DIRECTIONS *for questions 9 to 12:* Select the correct alternative from the given choices.
What is the percentage increase/decrease in the revenue from 2015 to 2016 of the company which showed the third highest percentage increase in revenue from 2014 to 2015? (Negative percentage represents a decrease in revenue)

a) –57.5%
b) –52.75%
c) **50%**
d) 75.5%

DIRECTIONS *for questions 13 to 16:* Answer these questions on the basis of the information given below.
Seven cities – A through G – are connected by two-way roads. The following diagram provides the roads between these seven cities and the length of each road in km:



Q13. DIRECTIONS *for questions 13 to 15:* Type in your answer in the input box provided below the question.
What is the minimum distance (in km) that a person has to travel to go from A to F?

Q14. DIRECTIONS *for questions 13 to 15:* Type in your answer in the input box provided below the question.
If a person wants to go from B to F, without passing through any city twice, what is the length (in km) of the longest route that he can take?

Q15. DIRECTIONS *for questions 13 to 15:* Type in your answer in the input box provided below the question.

A person starts from C and goes to E through the shortest route possible. From E, he goes to A, through the shortest route possible without visiting B. What is the total distance (in km) that the person would have travelled during this journey?

Q16. DIRECTIONS *for question 16:* Select the correct alternative from the given choices.
A person, who is at one of the seven cities, realizes that he can reach four cities by travelling for less than 10 km in each case. How many possibilities are there for the city that the person is at?

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

DIRECTIONS *for questions 17 to 20:* Answer these questions on the basis of the information given below.
Ramesh, a school teacher, wants to select a team of six students to help him with a project. He wants to select these six students from a group of ten – A through J – ensuring that there are at least as many girls in the team as there are boys. Among the ten students, A, C, G, H and I are boys and the rest are girls.
Further, it is also known that

1. if B is in the team, at most one among C and F can be in the team.
2. if A is in the team, neither H nor I can be in the team.
3. between D, E and F, at least one student must be in the team and at most two students can be in the team.
4. if E is in the team, neither B nor J can be in the team.
5. if I is in the team, D must be in the team.

Q17. DIRECTIONS *for question 17:* Select the correct alternative from the given choices.
In how many ways can Ramesh select the team such that there are an equal number of boys and girls in the team?

a) 12
b) **11**
c) **13**
d) **10**

Q18. DIRECTIONS *for question 18:* Type in your answer in the input box provided below the question.
In how many ways can Ramesh select the team such that there are more number of girls than boys in the team?

Q19. DIRECTIONS *for questions 19 and 20:* Select the correct alternative from the given choices.
If there are more number of girls than boys in the team, who among the following can never be in the team?

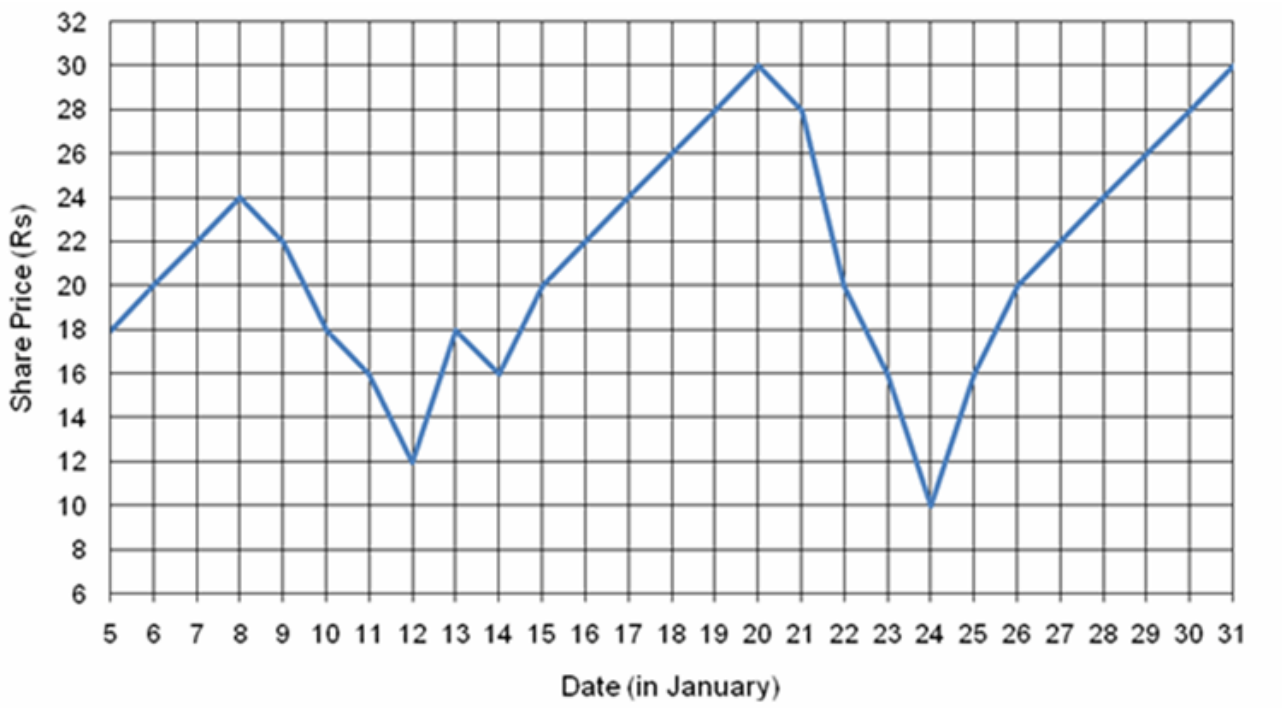
a) A

b) **C**
c) **G**
d) **H**

Q20. DIRECTIONS *for questions 19 and 20:* Select the correct alternative from the given choices.
Who among the following will definitely be in the team?

a) B
b) **C**
c) **F**
d) **D**

DIRECTIONS *for questions 21 to 24:* Answer these questions on the basis of the information given below.
The graph below provides the share price of XYZ Ltd. at the beginning of each day from 5th Jan to 31st Jan. Any person who trades in these shares does so only at the beginning of the day. Assume that there is no additional cost involved in buying and selling the shares.



Q21. DIRECTIONS *for questions 21 to 24:* Select the correct alternative from the given choices.
Kalyan, who had exactly Rs.160 with him, wanted to buy the shares of XYZ Ltd. If, during the given period, he wanted to buy the shares exactly twice and sell them exactly twice, what is the maximum profit that he can make?

a) Rs.1010
b) Rs.1100
c) Rs.1014
d) Rs.1140

Q22. DIRECTIONS *for questions 21 to 24:* Select the correct alternative from the given choices.
Raghu, a trader, had Rs.100 with him on 5th Jan and he wanted to maximize the amount with him by buying and selling the shares of XYZ Ltd. as many times as possible during the given period. What is the maximum amount that he can have at the end of 31st Jan?

a) Rs.1020
b) Rs.1022
c) Rs.1023
d) Rs.1024

Q23. DIRECTIONS *for questions 21 to 24:* Select the correct alternative from the given choices.
Tarun, who had Rs.100 with him on 5th Jan, purchased one share of XYZ Ltd. on 8th Jan and sold it on 11th Jan. N days after selling the share, he again purchased one share of XYZ Ltd. and sold it after N more days. If these are the only transactions made by Tarun during the given period and he neither made a profit nor incurred a loss during this period, how many values can N assume?

a) 1
b) **2**
c) **3**
d) More than 3

Q24. DIRECTIONS *for questions 21 to 24:* Select the correct alternative from the given choices.
If Jai had Rs.178 with him on 5th Jan, which he used to trade in the shares of XYZ Ltd. during the given period, what is the minimum amount that he could end up with at the end of 31st Jan?

a) Rs.30
b) Rs.32
c) Rs.34
d) Rs.44

DIRECTIONS *for questions 25 to 28:* Answer these questions on the basis of the information given below.
In a college, each student was graded, from A to E, for each course that he/she completed. Each course carried a certain number of credits (C) and each grade carried a certain weightage (W). The five grades, A, B, C, D and E, carry weight ages of 10, 8, 6, 4 and 0 respectively. For any semester, the CGPA of a student, who completed, say, *n* courses (Course 1, Course 2… Course *n*) in that semester, is calculated using the following formula:

$$CGPA = \frac{\sum_{i=1}^{n}(C_i \times W_i)}{\sum_{i=1}^{n} C_i}$$

In the above formula, Ci represents the number of credits carried by Course *i* and Wi represents the weightage of the grade received by the student in Course *i*.
In a certain year, there were only twelve students in the college studying in the first semester. The table below presents information about the weightages of the grades

obtained by each of the twelve students (except Carrie) in each course in the first semester. The number of credits carried by each course is given in parenthesis beside the respective course name. The students were also ranked, from 1 to 12, in the descending order of their CGPA. It is known that the CGPA of no two students in that semester was the same.

Students	Courses						
	SPM (3)	CM (4)	POM (2)	QRM (3)	AE (5)	DE (3)	QM (3)
Jack	10	8	4	6	10	4	4
Mary	8	6	8	0	4	10	10
Kim	10	6	0	4	6	10	4
Susan	0	4	6	4	8	10	10
Gary	0	8	6	6	10	4	10
Danny	6	10	10	8	0	8	8
Tom	4	4	10	8	8	6	6
John	10	0	8	10	8	0	0
Annie	4	10	4	0	8	8	6
Jude	6	6	8	10	0	4	4
Lea	10	8	6	0	4	10	4
Carrie							

Q25. **DIRECTIONS** *for questions 25 to 28:* Select the correct alternative from the given choices.
What is the maximum number of students whose rank could be better than that of Annie?

a) 4
b) **5**
c) **6**
d) **7**

Q26. **DIRECTIONS** *for questions 25 to 28:* Select the correct alternative from the given choices.
If Carrie was ranked neither first nor last and she obtained the same grade in all the courses which carried less than five credits, what is the sum of all the possible ranks of Carrie?

a) 21
b) **22**
c) **24**
d) **25**

Q27. **DIRECTIONS** *for questions 25 to 28:* Select the correct alternative from the given choices.
If Carrie was ranked second and she was graded C in all the courses which carried three credits, what will be the worst possible grade that she could have received in AE?

a) A
b) **B**
c) **C**

d) **D**

Q28. DIRECTIONS *for questions 25 to 28:* Select the correct alternative from the given choices.
Which of the following cannot be the rank of Carrie?

a) 2
b) **4**
c) **5**
d) **11**

DIRECTIONS *for questions 29 to 32:* Answer these questions on the basis of the information given below.
Eight persons – A through H – belong to the same family spread across three different generations. Among the eight, there are exactly two married couples. It is also known that each person is of a different age.
The following information is known about the relations between the eight persons:

1. All the persons who belong to any generation are older than all the persons who belong to the next generation and, in any couple, the wife is younger than the husband.
2. E is the younger brother of C, while G is the uncle of F, who is a male.
3. D is the youngest male and at least two females are younger than A's eldest child, one of whom is H.
4. The youngest child of A is a male and is married.
5. None of the grandparents have any siblings.

Q29. DIRECTIONS *for question 29:* Type in your answer in the input box provided below the question.
What is the maximum number of children that any of the eight persons have?

Q30. DIRECTIONS *for question 30:* Select the correct alternative from the given choices.
Who among the following is the third youngest?

a) F
b) **E**
c) **H**
d) **C**

Q31. DIRECTIONS *for questions 31 and 32:* Type in your answer in the input box provided below the question.
How many people are older than the father of F?

Q32. DIRECTIONS *for questions 31 and 32:* Type in your answer in the input box provided below the question.
Among the eight persons, how many persons have at least one sister younger than them?

QA

Q1. DIRECTIONS *for questions 1 and 2:* Select the correct alternative from the given choices.
If the quadratic equation $x2 - (a2 + 2)\,x + (a2 - 5a + 5) = 1$ has roots of opposite signs, find the range of a.

a) (–5, 9)
b) (2, 8)
c) (1, 4)
d) R – (–3, 2)

Q2. DIRECTIONS *for questions 1 and 2:* Select the correct alternative from the given choices.
A dishonest sugar merchant, while purchasing goods from the dealer, manages to receive 20% more sugar than the quantity of sugar he is supposed to receive. He later sells the sugar to his customers in such a way that for any customer, 30% of the sugar actually delivered must be added to get the original quantity of sugar asked for by the customer. The merchant sells the sugar to his customers at cost price (i.e., the price demanded by the dealer), but then charges them an additional amount claiming it as his transportation cost. If the additional amount that the merchant charges equals 10% of the cost that he incurred on the sugar that he is actually delivering to them, find his net gain percent. (Assume that the merchant's actual transportation cost is zero)

a) 66%
b) **60%**
c) **68%**
d) 71.6%

Q3. DIRECTIONS *for question 3:* Type in your answer in the input box provided below the question.
Find the numbers of factors of 152015 which are not factors of 152014.

Q4. DIRECTIONS *for questions 4 and 5:* Select the correct alternative from the given choices.
A transport company charges it customers for hiring its vehicles in the following manner. If the time taken for transportation is equal to or less than 4 hours, the company charges Rs.40/hr or Rs.10/km, whichever is higher. If the time taken is more than 4 hours, the company charges Rs.36/hr or Rs.5/km, whichever is higher. Harish hired a vehicle from the company, drove it for 60 km and paid a total of Rs.360. For how many hours did he drive the vehicle?

a) 5
b) **6**
c) **10**
d) None of the above

Q5. DIRECTIONS *for questions 4 and 5:* Select the correct alternative from the given choices.
Nikhil draws a set of eleven parallel lines on a plain sheet of paper. Akhil then draws another set of nine parallel lines on the same sheet of paper, such that each line that he draws intersects each line that Nikhil has drawn. Kirti then counts all the quadrilaterals that she can observe on the paper and arrives at a figure 'q'. If Kirti is not sure if she counted all the quadrilaterals that were possible, which of the following is the maximum possible value of *q*?

a) 990
b) 1260
c) 1980
d) 7920

Q6. DIRECTIONS *for question 6:* Type in your answer in the input box provided below the question.
Two motorcyclists, Ajay and Vijay, start simultaneously from a point S on an oval track and drive around the track in the same direction, with speeds of 29 km/hr and 19 km/hr respectively. Every time Ajay overtakes Vijay (anywhere on the track), both of them decrease their respective speeds by 1 km/hr. If the length of the track is 1 km, how many times do they meet at the starting point before Vijay comes to rest?

Q7. DIRECTIONS *for question 7:* Select the correct alternative from the given choices.
If x is real and greater than 1, then what is the value of the following expression?

$$\frac{x^2-x-6}{x^2+x-2}+\frac{x^2+2x-8}{x^2+3x-4}+\frac{2x^2-x-1}{x^2-2x+1}$$

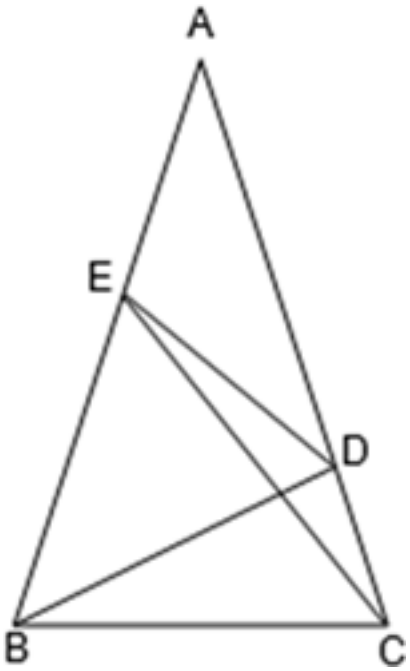
a) 3
b) 4
c) **1**
d) None of the above

Q8. DIRECTIONS *for question 8:* Type in your answer in the input box provided below the question.
Let S be the sum of the factorials of the first eight whole numbers. Find the remainder when 5S is divided by 13.

Q9. DIRECTIONS *for questions 9 and 10:* Select the correct alternative from the given choices.
Let $f(x) = |ax + b| + c$. If $f(2) = 15$ and the minimum value of $f(x)$ occurs for $x = 4$ and is equal to 9, find the value of $f(5)$.

a) 12
b) **15**
c) **10**
d) **8**

Q10. DIRECTIONS *for questions 9 and 10:* Select the correct alternative from the given choices.



In the figure above, AB = AC and $\angle$ A = $\angle$ DBC = 36°. If $\angle$ ECB = 54°, find $\angle$ DEC.

a) 18°
b) **24°**
c) **27°**
d) **36°**

Q11. DIRECTIONS *for question 11:* Type in your answer in the input box provided below the question.
If A and B are two sets, such that *n*(A) = 5 and *n*(B) = 3, then how many onto functions are possible from A to B?

Q12. DIRECTIONS *for questions 12 to 14:* Select the correct alternative from the given choices.
The average age of a couple at the time of their marriage was 27 years. After a few years, the couple had a pair of twins. If the average age of the family of four when each of the twins was five years old was two-thirds of the average age of the couple just before the birth of the twins, then find the average age of the family of four when each of the twins is 10 years old.

a) 22 years
b) 28 years
c) 25 years
d) 30 years

Q13. DIRECTIONS *for questions 12 to 14:* Select the correct alternative from the given choices.
Amit borrowed Rs.21,000 from Vinay at 10% p.a., under compound interest, compounded annually. If Amit has to repay the loan in two equal annual instalments, find the amount that he needs to pay in each instalment.

a) Rs.12,100
b) Rs.12,600
c) Rs.12,705
d) Rs.12,000

Q14. DIRECTIONS *for questions 12 to 14:* Select the correct alternative from the given choices.
Given $x > y$ and $z \neq 0$ and x, y, z are any real numbers, which of the following inequalities is not always true?

a) $x + z > y + z$
b) $xz > yz$
c) $\boldsymbol{xz^2 > yz^2}$
d) $(x - z) > (y - z)$

Q15. DIRECTIONS *for question 15:* Type in your answer in the input box provided below the question.
An open chain of diamonds consists of exactly 33 diamonds, with the diamond in the middle being the largest and the best. Starting from the left end, each successive diamond, till the largest diamond, costs 75 euros more than the previous one, and starting from the right end, each successive diamond, till the largest diamond, costs 175 euros more than the previous one. Find the value (in euros) of the largest diamond, if the total value of all the diamonds on the chain is 1,64,000 euros.

Q16. DIRECTIONS *for questions 16 to 19:* Select the correct alternative from the given choices.
The diagonals of rhombus ABCD are represented by the coordinate axes, such that BD is perpendicular to the x-axis. If the diagonals intersect at O, where OA = 4.5 units and AB = 7.5 units and for every point lying on AB, $xy \geq 0$, find the equation of CD.

a) $4x + 3y - 18 = 0$
b) $4x - 3y + 18 = 0$
c) $4x + 3y + 18 = 0$
d) Cannot be determined

Q17. DIRECTIONS *for questions 16 to 19:* Select the correct alternative from the given choices.
If $[x]$ denotes, the greatest integer less than or equal to x, then find the value of

$$\left[\sqrt{1}\right]+\left[\sqrt{2}\right]+\left[\sqrt{3}\right]+\left[\sqrt{4}\right]+\left[\sqrt{5}\right]+\ldots\ldots\text{upto}\ \left[\sqrt{1000}\right]$$

a) 18910
b) 20584
c) 20615
d) None of the above

Q18. DIRECTIONS *for questions 16 to 19:* Select the correct alternative from the given choices.

The time of oscillation of a pendulum of a clock varies directly with the square root of its length and inversely as the square root of acceleration due to gravity (g). If the length of the pendulum is 1 m and g = 10 m/sec², the time of oscillation is $\frac{2\pi}{\sqrt{10}}$ seconds. Find the time of oscillation, if the length is increased by 50% and g becomes 18 m/sec2.

a) $\frac{\pi}{3\sqrt{3}}$ seconds
b) $\frac{\pi}{\sqrt{3}}$ seconds
c) $\frac{2\sqrt{3}}{5}\pi$ seconds
d) $\frac{2\pi}{3\sqrt{3}}$ seconds

Q19. DIRECTIONS *for questions 16 to 19:* Select the correct alternative from the given choices.
Three mathematical operators @, # and * , are defined for real numbers as below:
@ (a, b, c)=$a(b + c)$
#(a, b, c)=ab + bc + ca
*(a, b)=ab
Other arithmetic operators like +, –, etc., have their usual meaning.
The value of which of the following expressions is equal to @ (a, b, c) + @ (b, c, a) + @ (c, a, b)?
I. 2#a, b, c)
II. 2{*(a, b) + *(b, c) + *(c, a)}
III. *(a, 2b) + *(2b, c) + *(c, 2a)

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

Q20. DIRECTIONS *for question 20:* Type in your answer in the input box provided below the question.
The prices of an apple, a mango and a custard apple are Rs.5, Rs.6 and Rs.4 respectively. If Manas spent Rs.P, Rs.2P and Rs.3P on the three kinds of fruits respectively, what is the minimum possible total amount (in Rs.) he could have spent in purchasing the three varieties of fruits?

Q21. DIRECTIONS *for question 21:* Select the correct alternative from the given choices.
When N chocolates were distributed equally among 98 students, 74 chocolates were remaining. Which of the following will be the last two digits of N, if it is expressed in the number system to the base 7?

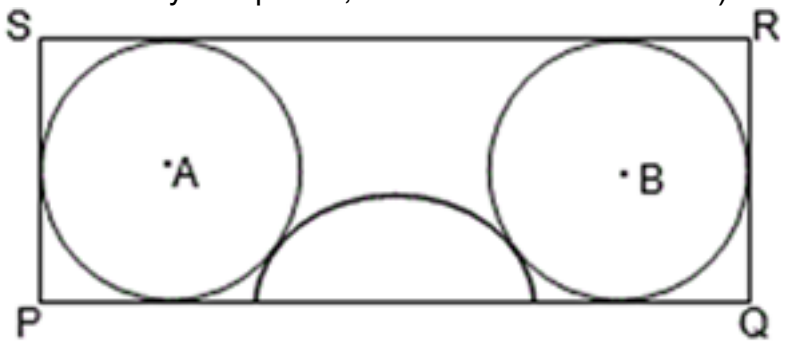
a) **34**
b) **37**
c) **25**
d) **54**

Q22. DIRECTIONS *for question 22:* Type in your answer in the input box provided below the question.
An entrance examination comprises exactly 200 multiple choice questions. Every question answered correctly is awarded one mark and every question answered incorrectly attracts a penalty of one-fourth of a mark. No marks are awarded or deducted for any question left unattempted. If a certain number of students, each of who attempted a different number of questions, all got the same net score of 40 marks in the exam, then what is the maximum number of such students possible?

Q23. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
Two trains, T1 and T2, simultaneously pass through a station on two parallel tracks without stopping at the station. The platform P2 passed by the train T2 is 50% more in length than the platform P1 passed by train T1. The train T1 runs at a speed of 72 kmph, while the other train is 25% slower and 50% longer. What is the ratio of the times taken by the trains T1 and T2 in passing the platforms P1 and P2respectively?

a) 4 : 3
b) 3 : 1
c) 1 : 2
d) Cannot be determined

Q24. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
In the rectangle PQRS given below, two identical circles are drawn with their respective centres at A and B, and each circle touching both the lengths and exactly one of the breadths. Now, a semicircle is drawn as shown, with its diameter along the length PQ and the arc of the semicircle touching both the circles. If the radius of the semicircle equals the distance between the two circles, what is the ratio of the length and the breadth of the rectangle? (The distance between two circles is defined as the shortest possible distance between any two points, taken one on each circle.)



a) 7 : 3
b) 8 : 3
c) 5 : 2
d) 17 : 7

Q25. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
Jayesh and Mohan start simultaneously towards each other from two places which are 1260 km apart. They travel with the respective speeds of 130 kmph and 122 kmph. What is the total distance they covered in the last minute before they cross each other?

a) 2.8 km
b) 3.6 km
c) 4.2 km
d) 5.0 km

Q26. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
Rahul and Naren play a peculiar game with marbles. The marbles are first arranged in four piles, each of 35, 36, 37 and 38 marbles respectively. At each turn, a player chooses one of the piles available and divides it into two smaller piles, both of which are then included in the piles available for the next player, and so on. The loser is the player who cannot do this. Assume that they play intelligently and they play to win.
Which of the following statements is/are false?
I. Rahul can never win, if he were to start the game.
II. Rahul will win everytime he starts the game.
III. Rahul can win irrespective of who starts the game.
IV. Naren can never win, if he does not start a game.

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

Q27. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
A regular hexagon ABCDEF is inscribed in a circle. From a point P, outside the circle, two tangents are drawn to the circle, touching it at A and C respectively. If PE = 30 cm, what is the area (in sq.cm.) of the triangle APC?

a) $150\sqrt{3}$
b) $75\sqrt{3}$
c) $50\sqrt{3}$
d) Cannot be determined

Q28. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.

Find the positive square root of $27 - 6\sqrt{6} + 12\sqrt{3} - 6\sqrt{2}$.

a) $3\sqrt{2} - \sqrt{3} - \sqrt{6}$
b) $3 + 2\sqrt{3} - \sqrt{6}$

c) $2\sqrt{6}+3\sqrt{3}-\sqrt{2}$
d) $3\sqrt{2}+\sqrt{6}-\sqrt{3}$

Q29. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
A toy consists of a base, which is in the form of a section of a sphere, surmounted by a cone. The base of the cone and the plane surface of the spherical section coincide completely. The volume of the conical portion is 250 π cu. units and its height is 30 units. If the total height of the toy is 55 units, then the surface area (in sq. units) of the sphere from which the base has been extracted is

a) 576 π
b) 676 π
c) 729 π
d) 784 π

Q30. DIRECTIONS *for questions 23 to 30:* Select the correct alternative from the given choices.
Ajay, Bhavan and Chetan had a total of 150 marbles with them. Ajay gave each of Bhavan and Chetan as many marbles as they already had. Bhavan, then gave each of Ajay and Chetan as many marbles as they already had. If Bhavan finally has 90 marbles, find the number of marbles that he initially had.

a) **70**
b) **60**
c) **50**
d) Cannot be determined

Q31. DIRECTIONS *for question 31:* Type in your answer in the input box provided below the question.
There are two pipes P1 and P2, through which water flows into a tank at speeds of 2 m/s and 6 m/s respectively. If the cross-sectional areas of the pipes are 15 cm2 and 25 cm2 respectively, and it takes 40 minutes to fill the tank, then find the capacity of the tank (in kilolitres).

Q32. DIRECTIONS *for questions 32 to 34:* Select the correct alternative from the given choices.
If p, q, r, s are four positive numbers, and $f(x) = |p + q| - |p - q| + |r + s| - |r - s|$, then $f(x)$ is equal to

a) Min (p, q) + 2 Max (r, s)
b) Max (p, q) + 2 Min (r, s)
c) 2 Max (p, q) + 2 Max (r, s)
d) 2 Min (p, q) + 2 Min (r, s)

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

If $f(x) = \frac{2x^2 - 5}{2x^2 + 1}$, then the minimum value of $f(x)$ is

a) **6.**
b) **0.**
c) – 6.
d) –5.

Q34. DIRECTIONS *for questions 32 to 34:* Select the correct alternative from the given choices.
In a clock, the length of the minute hand is 12 cm and the length of the hour hand is one-third less than that of the minute hand. What would be the distance (in cm) between the tips of the two hands at 8:00 a.m.?

a) **4** $\sqrt{17}$
b) **5** $\sqrt{19}$
c) **4** $\sqrt{19}$
d) **5** $\sqrt{23}$