T.I.M.E.
Triumphant Institute of Management Education Pvt. Ltd.

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INSTRUCTIONS

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.

2. This test has a total of 100 questions in three sections: (i) Verbal Ability and Reading Comprehension – 34 Questions (ii) Data Interpretation and Logical Reasoning – 32 Questions and (iii) Quantitative Ability – 34 Questions. The total time available for the test is **180 minutes**. However, you will be allotted exactly 60 minutes for answering the questions in each section and you cannot switch from one section to another while answering the questions in a section.

3. All questions carry three marks each. Each wrong answer to any multiple-choice type question will attract a penalty of one mark. Wrong answers to any non multiple-choice type question will not attract any penalty.

SECTION – I
Number of Questions = 34

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

We wear our hearts on our soles. "Shoes are the best indicator of how people are feeling," says June Swann, a shoe historian based in Northampton, England. One can chart the rise and fall of prosperity from the elevation of a heel; hear the distant rumblings of war in the configuration of a toe; measure social change by the thickness of a sole. Shoes speak of status, gender, ethnicity, religion, profession, and politics. To be precise, the first man on the moon is a myth – it was the first shoe on the moon. The latest in space footwear, the M2 Trekker, is constructed in three parts – an inner pressure bladder, a middle structural layer and a protective cover – to withstand the temperatures on the moon and Mars.

Politically correct or not, there is an irresistible urge to pet a drop-dead gorgeous shoe; put it on a leash; take it to bed. Shoes that are an accessory to a fairy tale have been designed: shoes made of rhinestones, feathers, sequins, buttons, bows, beads, grommets, rings, chains, ribbons, silk brocade, bits of coral, lace and fur. Natasha Marro who learned shoemaking in London and started designing boots for films like Star Wars and pop stars like Christina Aguilera says, "Shoes are theatre. Shoes turn you into someone else."

Every shoe tells a story and so does a sandal. Ease your hand gently along the insole of the sagebrush bark fibre sandal in the University of Oregon Museum of Natural and Cultural History, and you can feel the imprint of a big toe in what may be the world's oldest existing example of footwear. The sandal, found in Fort Rock Cave in central Oregon in 1938, may be 10,500 years old, and was worn by a native North American who lived in caves during the winter months and hunted in marshes in summer.

"These are the traces of human lives," says Tom Connolly, the museum's research director. "The worn heel pockets on the sandals; the charred pinpricks on the toe flaps allow you to put yourself at a fireside. There's the sense you get from an assemblage of sandals here, those big and worn, small and child-size, those caked in mud, that allows you to see them as products of real human families: mom, kids, dad, grandparents."

Though humans may have wrapped their feet in skins earlier, Erik Trinkaus, an anthropologist at Washington University in St. Louis, says sturdy shoes originated between 40,000 and 26,000 years ago. Trinkaus studied the foot bones of Neanderthals living 100,000 to 40,000 years ago, compared them with the more delicate foot bones of our ancestors living 26,000 years ago, and concludes that shoe wearers developed weaker toes because of the reduced stress and increased support footwear allows. From there, shoes evolved like stone tools and art, with other advances in human culture.

Jenna Tedrick Kuttruff, a textile expert at Louisiana State University, points out that of the group of fibre sandals (some as old as 8,000 years) found in a Missouri cave she has examined, no two are alike. "The wearers of these shoes lived a subsistence existence," she says. "They didn't need to make each pair different. But it's human nature to make things visually appealing, to make one pair a little more complex than others to set it apart from someone else's." The desire to wear something different, distinctive, and decorative – that is to say, the instinct for fashion – has been around for a very long time.

1. Which of the following statements about the sagebrush bark fibre sandal can be concluded from the passage?
   I. It is approximately 10.5 millennia old and probably the world's oldest example of footwear.
   II. It was worn only by Native North Americans and only during the winters.
   III. It bears a partial impression of the wearer's foot on the inside.
   IV. It is currently housed at Louisiana State University.
   (A) Only I, II and III (B) Only II, III and IV
   (C) Only I and III (D) Only I, II and IV

2. Which of the following statements about shoes can be deduced from the passage?
   (A) Along with stone tools and art, Neanderthals invented shoes about 26000 years ago.
   (B) The M2 Trekker was the first shoe in space ever.
   (C) Shoes make their wearers' toes stronger.
   (D) Skins were probably used to cover one's feet before shoes were invented.

3. Why does the author conclude that the instinct for fashion has been around for a very long time?
   (A) Because ancient shoes evolved alongside art, their evolution can be considered an advance in human culture.
   (B) Because the makers of ancient fibre sandals sought to make each pair unique and attractive, though they did not need to do so.
   (C) Because ancient fibre sandals used to be very visually appealing in spite of the subsistence existence of their wearers.
   (D) Ancient people sowed the seeds for modern fashionable footwear by being fashionable enough to wear fibre sandals.

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

Soon after Andrew Lees embarked on his medical career at University College Hospital London, one of his superiors gave him a rather strange reading list. Rather than the usual fusty anatomical volumes, it included *The Complete Sherlock Holmes.*

What on earth could the fictional detective teach an aspiring neurologist? As it turns out, a good deal, as Lees recently wrote in a paper in *Brain journal.* Whatever your expertise, the insights provide a welcome lesson in the art of rational thinking.

As Lees points out, Holmes' creator Arthur Conan Doyle was a physician himself, and there is evidence that he modelled the character of Holmes on one of the leading doctors of the day, Joseph Bell of the Royal Edinburgh Infirmary.

But Lees suspects that as his stories developed, Conan Doyle may have also drawn some inspiration from other doctors, such as William Gowers, who wrote the *Bible of Neurology*.

Gowers often taught his students to begin their diagnosis from the moment a patient walked through the door, as seen in a record of one of his clinical demonstrations, later published as *A Clinical Lecture on Silver and Syphilis*: "Did you notice him as he came into the room? If you did not, then you should have done so. One of the habits to be acquired and never omitted is to observe a patient as he enters the room; to note his aspect and his gait. If you did so, you would have seen that he seemed lame, and you may have been struck by that which must strike you now – an unusual tint of his face." It's remarkably similar to Holmes' habit of profiling each person he meets based on the scantest of clues. In particular, it was the importance of the seemingly inconsequential that seems to inspire both men.

Both Gowers and Holmes also warned against letting your preconceptions fog your judgement. For both men, cool, unprejudiced observation was the order of the day. It is for this reason that Holmes chastises Watson in *The Scandal of Bohemia*: "You see, but you do not observe. The distinction is clear." Or in the words of Gowers: "The method you should adopt is this: Whenever you find yourself in the presence of a case that is not familiar to you in all its detail forget, for a time all your types and all your names. Deal with the case as one that has never been seen before, and work it out as a new problem *sui generis*, to be investigated as such."

Occasionally, Gowers' real-life powers of observation appear to have rivalled those of Conan Doyle's fictional hero. Consider his study of a man initially misdiagnosed with a psychological disturbance similar to hysteria:

"I looked casually at the bed-card and at once my eye was caught by the record of his occupation 'Painter'. I looked from the bed-card to his gums, and there I saw written in equally distinct characters the record of the effect of his occupation – in a conspicuous lead-line." By simply using his eyes to see what others had missed, Gowers correctly inferred that the man was being poisoned by his pigments.

There are many other examples: how both men "reasoned backwards", for instance, dissecting all the possible paths that may have led to a particular disease (in Gowers' case) or murder (in Holmes').

But perhaps the most important lesson to be learned, from both Gowers and Holmes, is the value of recognising your errors. "Gentlemen – It is always pleasant to be right, but it is generally a much more useful thing to be wrong," wrote Gowers, while Holmes admits: "I confess that I have been blind as a mole, but it is better to learn wisdom late than never to learn it at all."

4. How does studying about Sherlock Holmes help an aspiring neurologist?
   (A) The cases that Sherlock Holmes solves are similar to the cases that a neurologist needs to diagnose.
   (B) The character of Sherlock Holmes, being modelled after a real-life doctor, was well versed in medicine.
   (C) The qualities that Holmes exhibits in solving his cases can be useful for a neurologist in diagnosing the ailments of his patients.
   (D) Most of the cases that Sherlock Holmes solves involve neurological conditions.

5. Which of the following principles does the author emphasize while presenting the demonstration by Gowers which was later published as *A Clinical Lecture on Silver and Syphilis*?
   (A) When diagnosing a patient, identifying the key symptoms of a disease in the patient is more important than observing the patient himself.
   (B) A doctor should profile each person he meets in order to identify if the person is suffering from any ailment.
   (C) Traits that are considered inconsequential often convey more than the ones considered important.
   (D) Characteristics usually regarded as insignificant can be important in solving a case, medical or criminal.

6. What does Gowers imply (in para 7) when he states that "Whenever you find yourself in the presence of a case that is not familiar to you in all its detail, forget for a time all your types and all your names"?
   (A) Theoretical knowledge is not useful when dealing with most of the cases.
   (B) An unfamiliar case should not be typecast and should be treated as unique.
   (C) Every case has to be worked out as a new problem *sui generis*, without any biases.
   (D) Information on any unfamiliar case will not usually be available in the existing medical knowledge.

7. Which of the following is not mentioned in the passage as a similarity between Holmes and Gowers?
   (A) Both of them recognized the importance of the seemingly inconsequential.
   (B) Both of them scrutinized all the possible causes for an effect and zeroed in on one.
   (C) Both of them understood the importance of being wrong.
   (D) Both of them profiled every person they met based on the slightest clues.

8. Which of the following can be inferred about the patient (in para 8) who was "initially misdiagnosed with a psychological disturbance similar to hysteria"?
   (A) The doctor who misdiagnosed the patient was not aware that the patient was a painter by profession.
   (B) The patient was unwittingly ingesting the pigments present in the paints that he used to work with.
   (C) The patient had accidentally swallowed large quantities of paint because of which he was admitted to the hospital.
   (D) Gowers deduced that the patient must be a painter by observing the lead-line present along the patients' gums.

9. Which of the following statements is closest to the principle underlying the approach adopted by Holmes and Gowers as mentioned in the penultimate paragraph – "...both men "reasoned backwards",... dissecting all the possible paths that may have led to a particular disease... or murder..."?
   (A) When you have eliminated the less possible, whatever remains, even if improbable, must lead to the truth.
   (B) No cause occurs without effect, and no effect occurs without cause.
   (C) Any effect will have more than one cause all of which can be equally probable.
   (D) Observation is the key to diagnosis.

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

In the modern world, there's a certain snobbery around telling comic strips. Even when we do try to give them a certain credibility, it can sometimes feel like we are damning them with faint praise, as fantasy author Neil Gaiman remembered when a pompous fan told him his Sandman series should be considered "graphic novels" rather than mere "comic books": "I felt like someone who had been informed that she wasn't actually a prostitute, that in fact she was a lady of the evening."

If Gaiman had been a Mayan artist living between 600 and 900 AD, his experience may have been very different; their drinking vessels were painted with pictures and text that told a story as you turned the cup. Far from being throwaway escapism, they were considered prized objects and often exchanged to ease political negotiations and to build alliances between states. "It was the highest quality art you could have," says Soeren Wichmann at Leiden University in the Netherlands. "It was highly valued, whereas in modern societies comics are frowned upon."

Wichmann points out that unlike modern graphic novels, they mainly depicted just a few scenes from well-known stories – the idea being that its viewers already knew the main sequence.

Of course, visual storytelling of some kind can be seen in the oldest cave paintings, but he thinks it is particularly striking how similar these Mayan scenes are to the comics we enjoy today – including the way they represent speech, motion, bad smells, funny animals and naughty jokes. "You have all these mechanisms come together – it's getting close to something that is very similar to comics."

Should we be surprised by these strange parallels? Neil Cohn at the University of California, San Diego (who edited *The Visual Narrative Reader*) points out that communicating with visual narratives may be as natural as speech or hand gestures; it should really be considered another form of language. Like spoken or signed languages, he therefore thinks each visual language may evolve their own vocabularies and grammars.

You can see this all across the world; he has found that American comics and Japanese manga books follow distinct rules when constructing their stories... So, even though the drawings on Mayan vessels may look like modern comics, they will have their own conventions too, he thinks; they are not the same thing.

Even so, some of the similarities have caught his attention; he is intrigued that visual metaphors like fire are still used to represent anger, even hundreds of years ago in a distant culture. "That anger is associated with fire in the Mayan narratives... is informative for how we conceive of these types of abstract ideas."

If nothing else, these fantastic pieces of artwork should remind us that comical, visual stories were once the gifts of kings – the Mona Lisas of their day.

10. Which of the following is NOT mentioned in the passage as a difference between modern comics and the comics on Mayan pottery?
(A) While comics in the modern world are considered only a pastime, in the Mayan times, they were considered a form of art.
(B) Modern comics pictorially represent mere stories, whereas the comics on Mayan pottery depicted informative and/or abstract ideas.
(C) The rules that are followed by comics in the modern times are different from those that were followed during the Mayan times.
(D) Comic artists during the Mayan times were considered creators of high quality art unlike the comic artists in the modern times.

11. When the author states that "Even when we do try to give them a certain credibility, it can sometimes feel like we are damning them with faint praise", (para 1), he implies that the comic artists in the modern world
(A) are not as valued as the comic artists during the Mayan times.
(B) are considered arrogant and snobbish because of the praise they receive for their work.
(C) are usually belittled even in the praise that they receive for their work.
(D) receive only subtle praise and are severely underappreciated.

12. Which of the following statements, if true, will most weaken Neil Cohn's observations on Mayan comics?
(A) Recent analysis has shown that the rules followed in depicting stories on Mayan pottery are very similar to those followed by the creators of modern comics.
(B) Visual narratives are much more difficult to comprehend and therefore, are not as natural as speech or hand gestures.
(C) While there are a few similarities with modern comics in the depiction of certain emotions, there are many differences in the way other elements are represented in the comics on Mayan pottery.
(D) Unlike modern comics, comics on Mayan pottery represent scenes from well-known stories and are therefore usually incomplete.

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.

Sleep – or the lack of it – tends to obsess me. This is because I used to think I did not get enough of it. For a while, this was true. After I crossed 45, I usually slept no more than six hours, sometimes less. At 49, I was diagnosed with ischemic heart disease, a block in a minor artery. It is, of course, hard to attribute causality, but, in general, research has shown that impaired sleep can put you at risk from a variety of ailments, including diabetes, stroke and heart disease. Anecdotally, I know that when I slept badly, many things were difficult, from exercising to working.

Disturbed sleep is a common global, urban phenomenon, and the trigger for a slew of related studies. The latest research, presented last week at the American Stroke Association's International Stroke Conference, summed it up thus: Seven to eight hours of sleep a night and 30 to 60 minutes of exercise, three to six times a week, reduces stroke risk in adults by 25%. They also found that sleeping more than eight hours a night increases stroke risk by 146%.

So, beneficial sleep appears to be a balancing act between length of sleep, exercise and diet.

The role of diet was explained most clearly in December 2015. Weight loss from dietary change can make you sleepier, regardless of what you weigh, said a study in the journal *Sleep*. Older studies have established links between obesity and sleepiness: losing weight can give you more daytime energy and improve the quality of sleep.

A key to understanding a good night's sleep is to disabuse yourself of some popularly held notions: that animals get better sleep; that your ancestors slept better; and that people who live simpler, close-to-nature lives get better sleep.

Animals – specifically, those related to humans – do indeed get more sleep than us, but we get better sleep, revealed a December 2015 study in the journal *Evolutionary Anthropology*. Humans average seven hours of sleep a night, while some other primates grab between 14 and 17 hours. There is a difference in the quality of human and primate sleep, said the study, explaining that a quarter of our sleep is spent in the deeper stage called REM (rapid eye movement), the phase of dreams. For many of our primate cousins, this phase constitutes no more than 5% of sleep.

What about our more primitive human relatives in hunter-gatherer societies? Surely, they get better sleep without the glare of and alerts from smart phones and green-blue light from computers and televisions on standby? Well, they get slightly less sleep than we do, so artificial light does not appear to be a sleep-depriving factor, said an October 2015 study in the journal *Current Biology*.

There is an anthropological basis for the short, efficient sleep of humans. When our ancestors moved from the trees to the ground and discovered fire, they found it helped them keep predators at bay, stay warm –and provide better sleep, which in turn freed up time for learning and bonding. And deep sleep probably allowed brains to become smarter.

13. Which of the following could be a possible reason for the author to mention the latest research presented at American Stroke Association's International Stroke Conference?
(A) To establish causality between exercise and decrease in the risk of a stroke.
(B) To emphasize the correlation between duration of sleep and risk of a stroke.
(C) To understand what is the risk of the author getting a stroke.
(D) To understand the link between urbanization and sleep deprivation.

14. Which of the following is a conclusion of the study published in the journal *Sleep* mentioned in the passage?
(A) People who lose weight due to changes in their diet will feel sleepier.
(B) The quality of sleep improves in people who lose weight.
(C) People who lose weight due to changes in their diet do not have to sleep as long as others.
(D) Changes in diet will make people sleepier.

15. Which of the following can be understood from the passage regarding the quality of sleep?
(A) The more one sleeps, the better the quality of sleep.
(B) Quality of sleep can be improved by losing weight.
(C) People who exercise regularly will have a better quality of sleep compared to those who do not.
(D) People who live close to nature have a better quality of sleep.

16. Which of the following is a correct observation regarding the sleep of primates and humans, according to the passage?
(A) Even though primates sleep for a longer duration, the REM phase of their sleep is significantly shorter than that of humans.
(B) Even though the duration of the REM phase of sleep is almost the same in humans and primates, primates need to sleep significantly longer than humans.
(C) Humans spend significantly more time in the REM phase of sleep than primates because they are arboreal.
(D) Since humans sleep for shorter duration as compared to primates, their quality of sleep is better than that in primates.

17. It can be understood from the passage that compared to us, primitive humans in hunter-gatherer societies
(A) got slightly less sleep than we do but the quality of their sleep was better than that of our sleep.
(B) got slightly less sleep than we do and the quality of their sleep was worse than that of our sleep.
(C) slept for shorter durations.
(D) slept for shorter durations and usually had a disturbed sleep.

18. According to the passage, humans benefited from the short, efficient sleep cycle because it
(A) helped them discover fire which protected them from predators.
(B) freed up their time which they used for developing efficient hunting practices.
(C) helped them to learn new things and bond with others in their free time.
(D) helped them to become physically fit as compared to other primates.

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.

Just as it is impossible to discuss intelligently the history of the potato without a reference to those early agriculturists who won and fashioned it, so would it be futile were we to leave undescribed the peculiar setting in which both plant and man evolved their mutual understanding. For the early history of the potato was set on a stage dominated by the mysterious grandeur of the Andes, whose dread influence could never have been long absent from the thought and actions of the men who, thousands of years before the coming of Columbus, won for all mankind this and other priceless gifts from the recesses of nature's storehouse.

The problem is confined geographically to the continent of South America, by the fact that nowhere in Central or North America was the potato cultivated in pre-Columbian times. This is the more curious when we realize that as far north as Colorado various species of wild tuber-bearing *Solanums* are to be found.

Mexico, in particular, is so rich in such plants and the tubers of some of these wild plants are at times eaten by the natives, but they are not, and apparently never were, cultivated. The same is reported from Guatemala. When later the potato gained an entry into Mexico after the Conquest, it was the Peru-Bolivian potato which was imported and grown there. The Navajo Indians of South Western United States still boil and roast the small tubers of the two wild species, *S. jamesii* and *S. fendleri*. It seems possible that the people of these parts, especially in Mexico, were on the point of developing an independent culture of the potato when the coming of the Spaniards destroyed their civilization.

In South America, the immigrant peoples found a large variety of wild potatoes, but in contrast to those of North and Central America, they brought them into cultivation at an early stage of their settlement, possibly 2000 years or more before the Spanish Conquest. Why people of the same original race should have behaved so differently on either side of the equator is a problem, the solution of which is almost certainly to be found in the extraordinary geographical and climatic conditions of the area into which the settlers penetrated.

In the warm regions of Mexico and Central America, the cereal maize, so easily grown and so bounteous in its returns, contended with the manioc or cassava for the first place in nature's bounty. On the high tablelands of inner Colombia, Ecuador and Bolivia, where manioc is wanting and maize begins to fail, we may suppose that successive immigrant waves, searching for a staple food, eventually found it in the wild potato. These high altitudes, by reason of their isolation and their freedom from malaria and the diseases of the jungle, afforded a permanent home in which the immigrants attained for a time a level of culture only a little below that reached later on the Peruvian coast.

If man's material and psychological experience within a specific environment influences the structure of the society he builds, moulding the character, and colouring the reactions of the individuals who compose it, a thesis which to-day is not likely to be seriously disputed, then it is a matter of no small importance to determine how and from what direction the original immigrant natives, the first who cultivated the potato, reached the area we are discussing.

19. Which of the following is the most appropriate interpretation of the "problem" referred to by the author when he states "The problem is confined geographically to the continent of South America" (para 2)?
(A) Understanding why potato is cultivated only in certain regions and not elsewhere.
(B) Understanding the origin of potato cultivation.
(C) Identifying the factors responsible for the growth of potato cultivation in South America.
(D) Exploring the relation between the South American culture and the cultivation of potato.

20. It can be inferred from para 3 that the Spanish Conquest
(A) wrecked an independent strain of potato crops which were grown in parts of North America.
(B) was responsible for the introduction of Peru-Bolivian potatoes in Mexico as it created a bridge between North and South America.
(C) destroyed any chance of a different strain of potatoes being developed in North America.
(D) united the regions where Colombia, Peru, Ecuador, Bolivia and Chile are now present and facilitated the spread of the potato crop in these regions.

21. According to the third, fourth and fifth paragraphs of the passage, what is the primary reason for potatoes to be cultivated in the regions south of the equator but not to the north?
(A) The geography and climate to the north of the equator did not permit the cultivation of potatoes but were favourable for the cultivation of maize and manioc.
(B) By the time the immigrants who settled in the northern regions developed the tools required for the cultivation of the potatoes, the Spaniards destroyed their civilization.
(C) The southern regions, because of the geographic and climatic conditions, had an abundance of wild potatoes which were not present in the north.
(D) The geographic and climatic conditions in the northern region allowed the cultivation of maize which provided better yield than potatoes.

22. What advantage did the high altitudes of inner Colombia, Ecuador and Bolivia provide, as can be understood from the penultimate paragraph of the passage?
(A) The high altitudes allowed the development of culture which could never be achieved in the Peruvian coast.
(B) The immigrants were able to form permanent settlements at these altitudes primarily because they found an abundant food supply in the wild potatoes present there.
(C) The high altitudes offered potato crops protection from diseases thereby increasing their yield, because of which the immigrants were able to introduce potatoes in that region.
(D) As the high altitudes offered protection from diseases, the immigrants formed permanent settlements in these regions and this led to potatoes being adopted as staple in that region.

23. Which of the following encouraged the cultivation of potatoes in South America?
I. Absence of diseases
II. Presence of endemic wild potatoes
III. Spanish Conquest
IV. High altitudes
V. The Incas

(A) Only I and II (B) Only II and III
(C) Only I, II and IV (D) Only I, II, IV and V

24. Why is it important to understand how and from where the original immigrant natives reached South America, as can be inferred from the passage?
(A) To understand the conditions which favoured the cultivation of potato, we must first understand the environmental influence on the natives before and during their immigration to South America.
(B) The direction from which the immigrant natives reached South America provides information about the origin of the potatoes carried by the natives during their immigration.
(C) The natives' material and psychological experience with the potato crop endemic to South America played an important part in further cultivating the crop in that region.
(D) Immigrant natives who reached South America from different directions had different reactions to the availability of potato crop in South America.

DIRECTIONS *for questions 25 to 28:* The five sentences (labelled 1, 2, 3, 4 and 5) given in the following question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

25. (1) Now, scientists have found an explanation for this mysterious glacial stability.
(2) But in the mountainous Karakoram region of Asia – home to K2, the second-highest peak on Earth – the glaciers aren't melting.
(3) While precipitation is increasing across the Himalayas, most of this moisture drops in the summer – except in Karakoram, where snow dominates the scene.
(4) Glaciers around the world are melting, retreating and even vanishing altogether.
(5) If anything, some are expanding.

26. (1) Many successful criminal prosecutions rely largely or entirely on circumstantial evidence, and civil charges are frequently based on circumstantial or indirect evidence.
(2) A popular misconception is that circumstantial evidence is less valid or less important than direct evidence.
(3) The 2004 murder trial of Scott Peterson was another high-profile conviction based heavily on circumstantial evidence.
(4) Much of the evidence against convicted American bomber Timothy McVeigh was circumstantial, for example.
(5) This is only partly true: direct evidence is popularly, but mistakenly, considered more powerful.

27. (1) The first real price increase occurred in July 2010 when bitcoins went from around $0.0008 to $0.08 for a single coin.
(2) Bitcoins initially traded for next to nothing.
(3) Bitcoin was first invented by Satoshi Nakamoto in 2008 and released as an open-source software in early 2009.
(4) The currency has seen some major rallies and crashes since then.
(5) The alternative currency has seen a lot of action in its fairly short life.

28. (1) Large scale crop failure and disease were also endemic during this time, as well as raids by other tribes and civilians.
(2) In 1868, a treaty was negotiated between Navajo leaders and the Federal government allowing the surviving Navajo to return to a reservation on a portion of their former homeland.
(3) Furthermore, a small group of Mescalero Apaches, enemies of the Navajo, had been relocated to the area resulting in conflicts.
(4) This was a failure for many reasons as the government failed to provide an adequate supply of water, wood, provisions, and livestock for 4,000–5,000 people.
(5) In 1864, around 9,000 Navajos were forced to embark on a trek of over 300 miles to Fort Sumner, New Mexico for internment at Bosque Redondo.

DIRECTIONS *for questions 29 to 31:* Four alternative summaries are given below the text. Choose the option that best captures the essence of the text.

29. In the 16th, 17th, 18th, and 19th centuries music inspired writers, philosophers, aristocrats and other thinkers of the time. Music of a classical variation was not available to the public. One had to attend a performance to experience the work of composers such as Bach, Beethoven, and Mozart. Such music was considered that of the upper class and the sounds coming from the peasant's homes and markets were lesser versions of these grand orchestras. As time progressed there was a shift. With the birth of radio, television, record players, and electric instruments, the entire idea of music changed. Music in the 20th century is built on popularity among the masses. One hit wonders rule the radio waves. Everyone, from the poorest of poor to the richest of rich has the ability and right to listen to music. Age matters not in music appreciation, the 20th century marks the time when young children begin to learn the classics on the piano.
(A) Music in the 20th century has all the aspects of something underground and music after the 20th century is that underground becoming mainstream.
(B) Music before the 20th century was a privilege of a chosen few but music in the 20th century is accessible to and appreciated by a large section of the population.
(C) Music in the 20th century has a much greater variety than that of previous centuries.
(D) Music wouldn't truly have a purpose without its audiences. Before the 20th century, music was the indulgence of the upper class but in the 20th century, everybody enjoys one hit wonders.

30. The breeding and brooding habits of the Fiordland crested penguins have been difficult to study because they live in the temperate rainforest. The nesting areas are difficult to see because of the thick vegetation where the nests are located. The total population has been estimated to be fewer than 1,000 breeding pairs. Fiordland penguins make their nest in the soft ground in the thick undergrowth of plants well apart from other birds' nests. Usually two eggs are laid but only one chick survives. The egg is kept warm for 30 to 36 days, with the male and the female taking turns on the nest in long 5 to 12 day shifts. After the eggs hatch, the male stays with the chick for 2 to 3 weeks, while the female brings food. Chicks are left alone to hide in the underbrush or they may form small crèches while both parents hunt food. Chicks get their adult feathers and go to sea in about 75 days. The Fiordland penguins are shy and timid and live and breed on the rugged west and southwest coastlands of the South Island of New Zealand, including two offshore islands of Stewart and Solander.

(A) The Fiordland penguins, believed to be fewer than 1000 breeding pairs, breed on coastlands of the South Island of New Zealand. Both parents take turns at brooding, for about a month. Hatched chicks are looked after by the male parents for about three weeks, while the females bring food. Thereafter both parents may forage, leaving the chicks in groups or in nests in the soft ground in the thick underbrush of the temperate rainforests. In about seventy five days, the chicks are grown enough to go to sea.

(B) Fewer than 1000 breeding pairs of the Fiordland penguins are found on coastlands of South Island of New Zealand. The nests are in soft ground in the thick underbrush of the temperate rainforests. The Fiordland penguins take 30 to 36 days to hatch. The male stays on in the nest to keep the eggs warm. The female brings food for the chicks. The chick is abandoned in a crèche after 3 weeks and goes to sea in 75 days.

(C) Fiordland penguins hatch in a nest made in the soft ground in the thick undergrowth of plants near the coastlands of South Island of New Zealand. The male and female penguins take turns hatching one of the two eggs laid initially. Once the eggs hatch, the male leaves to take care of the feeding needs of the chick. The chick learns to become independent after 3 weeks of life and takes to the oceans in 75 days.

(D) Fiordland penguins are natives of New Zealand. The penguins take 30 to 36 days to hatch. The male and female penguins take turns to keep the eggs warm for 5 to 12 hours a day. One of the two eggs hatch. The female brings the food to the surviving chick for the first 2 to 3 weeks, and leaves the chick in a crèche with the male.

31. Why cannot we talk of the real Tao? The real Tao is not a concept, and therefore words cannot describe it. It is beyond organized religion, cultures, philosophy, and spirituality. It is something that must be lived and experienced and not just talked about. All Chinese philosophy has tried to understand the cosmos and unify Heaven, Earth and mankind, the sublime and the mundane, the material and the spiritual. The Chinese have always tried to integrate man and nature, knowing that man and nature are not two separate entities. The ancient Chinese had a holistic, ecological view of life, in which our existence on earth only makes sense if it is linked with the sun, the moon and the stars, the wind and the rain, and all the other processes of nature. At its deepest level, Taoism which is of ancient Chinese origin, says we have enough to do being authentic and vital, compassionate and ethical in real life – right here, right now; so, we need not invent other worlds or ruling forces whose existence in any case is uncertain and confusing. Taoism exhorts the seeker to be natural, follow nature's principles, and attain an enlightened and empowered state of being.

(A) Taoism is against the invention of new worlds because that gives rise to uncertainties and confusion. By supporting a life close to nature, Taoism actually contradicts the social mores and the precepts of established cultures. It unifies heaven and earth and other elements of the cosmos.

(B) Taoism, as a spiritual concept, originated in China, and is aimed at a proper understanding of the cosmos. Taoism advocates a life close to nature as all life depended on all other life for its existence and that thinking of things as separate is only possible intellectually. It forbids a pursuit of other worlds and forces which will leave one confused and unenlightened.

(C) Taoism, an ancient Chinese philosophy, seeks a basic comprehension of the cosmos. Taoism advocates a natural way of life, and claims that invented worlds are not needed to give a good life. It has had a significant impact on the development of Chinese civilization and its ideas pervade all aspects of the culture.

(D) Taoism, of ancient Chinese origin, defies wordy description and is beyond organized religion, cultures, philosophy, and spirituality. Its essence is performing natural, moral and real deeds in the here and now and being connected with nature, without inventing new worlds or uncertain ruling forces, so that one attains enlightenment.

DIRECTIONS *for questions 32 to 34:* 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.

32. (1) In the UK, it is responsible for an estimated 700,000 cases, over 100 deaths and costs almost £1 billion to the UK economy.

(2) This leads to the bacterium still being in a viable state to reproduce in the human gut and make an individual ill.

(3) Patients with *Campylobacter* poisoning should drink lots of fluids to stay hydrated as long as the diarrhoea lasts.

(4) The majority of cases in the UK are the result of contaminated chicken meat, which has not been cooked properly.

(5) *Campylobacter jejuni* is a serious problem in the western world because it is one of the leading causes of food poisoning.

33. (1) Franchises ranging from "Doctor Who" to "Back to the Future" have seen adventure-loving humans get in a vehicle and arrive in the past or future.

(2) Some scientists believe that time travel is impossible, saying that an attempt would be fatal to any human who chooses to undertake it.

(3) Time travel – moving between different points in time – has been a popular topic for science fiction for decades.

(4) While most people think of time as a constant, physicist Albert Einstein showed that time is an illusion, a fourth dimension.

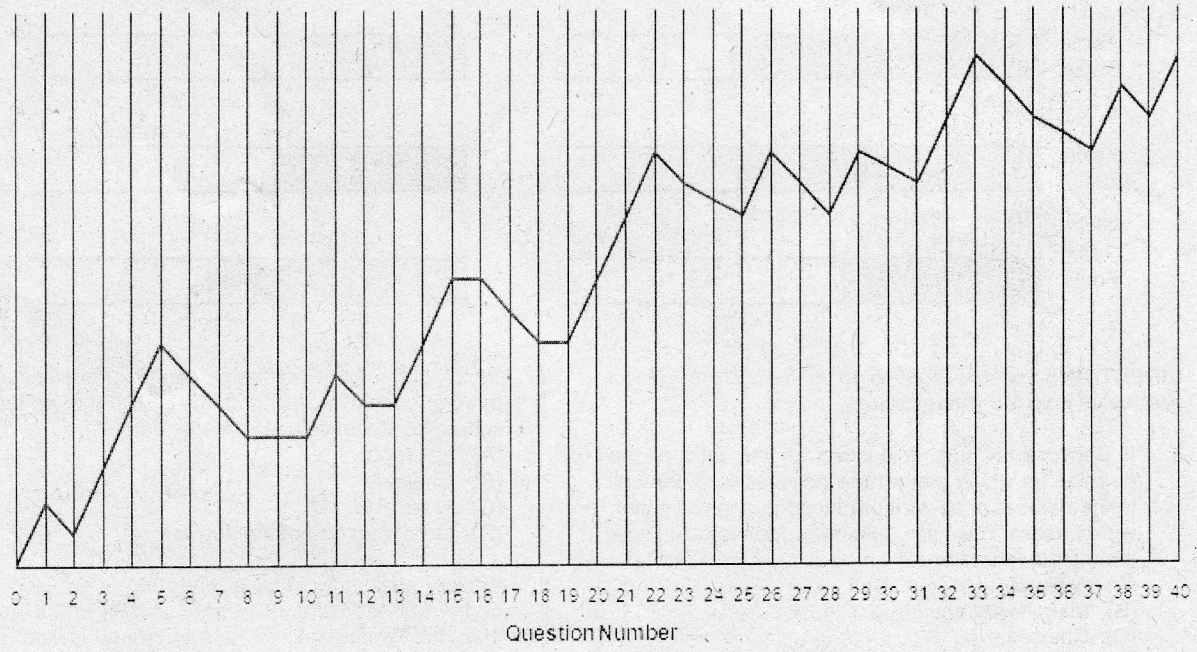
(5) The reality, however, is more muddled.

34. (1) That also would make them stop dividing and eventually die.
(2) Because broken DNA is dangerous, a cell has the ability to sense and repair chromosome damage.
(3) Telomeres do not shorten in tissues where cells do not continually divide, such as heart muscle.
(4) Without telomeres, chromosome ends could fuse together and corrupt the cell's genetic blueprint, possibly causing malfunction, cancer, or cell death .
(5) Without telomeres, the ends of chromosomes would look like broken DNA, and the cell would try to fix something that wasn't broken.

SECTION – II
Number of Questions = 32

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

In an online test which comprised 40 questions, every correct answer carried four marks while each wrong answer attracted a penalty of two marks. Further, the student was allowed to leave up to five questions unattempted without attracting any penalty, beyond which, each subsequent question (i.e., in excess of the five) that he left unattempted, carried a penalty of 1 mark. During the test, after each question that the student attempted/left unattempted, the net score of the student until (including) that question was evaluated. The line graph below shows the net score of the student after the evaluation of each question:



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

1. How many questions which were not attempted by the student attracted a penalty?

2. What is the final score of the student in the test?

DIRECTIONS *for questions 3 and 4:* Select the correct alternative from the given choices.

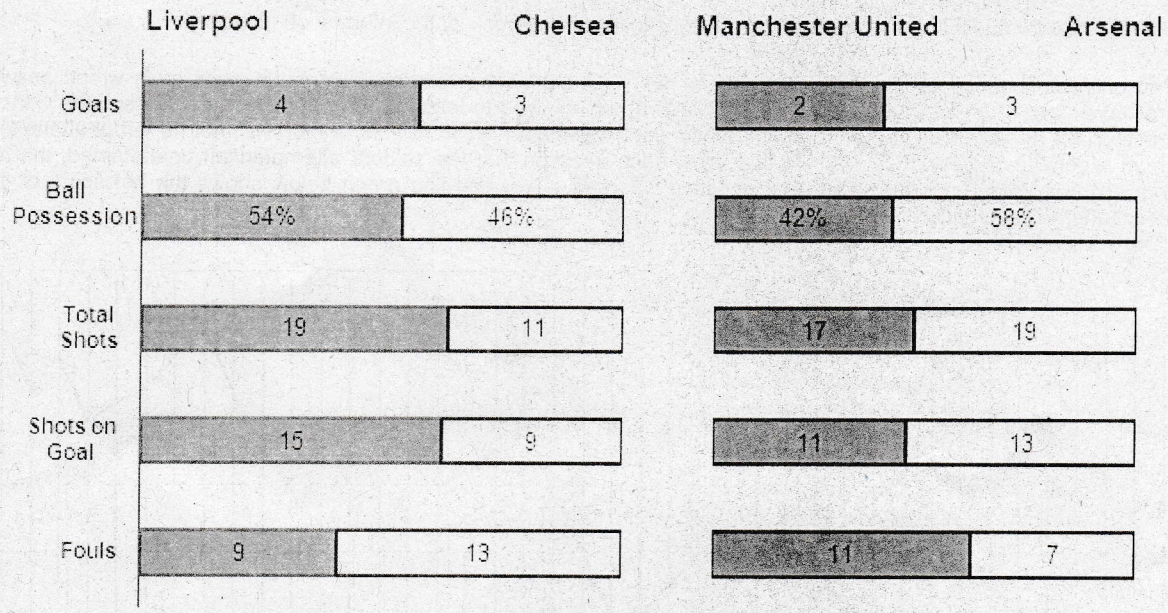
3. How many of the questions that were answered correctly by the student were such that they were preceded by a question which was also answered correctly but succeeded by a question that was answered incorrectly?
(A) 3 (B) 4
(C) 7 (D) 6

4. If the net score obtained by the student in the first 'i' questions of the test, expressed as a percentage of the maximum possible score that can be obtained in the first 'i' questions, is defined as p_i, then which of the following is the highest?
(A) p_7 (B) p_{15}
(C) p_{22} (D) p_{33}

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

The semi-finals of a football tournament took place between four teams – Arsenal against Manchester United and Chelsea against Liverpool. Each match lasted for exactly ninety minutes and the following information is provided in the graphs below regarding the two matches:

- *Goals*: The total number of goals scored by each team in the match.
- *Ball Possession*: The percentage breakup of the time for which each team had possession of the ball.
- *Total Shots*: The total number of shots taken at the goal, comprising both shots which are on target, called *Shots on Goal*, and shots which are off target, called *Shots off Goal*.
- *Fouls*: The total number of fouls committed by each team during the match.



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

5. If Conversion Time is defined as the ratio of the duration for which a team has possession of the ball to the number of shots it produced during the game, which team has the minimum conversion time among the four teams?
(A) Arsenal
(B) Manchester United
(C) Chelsea
(D) Liverpool

6. For which team is the ratio of the number of fouls committed by the team to the duration for which the ball was in possession of the opponents' team the highest?
(A) Manchester United (B) Arsenal
(C) Liverpool (D) Chelsea

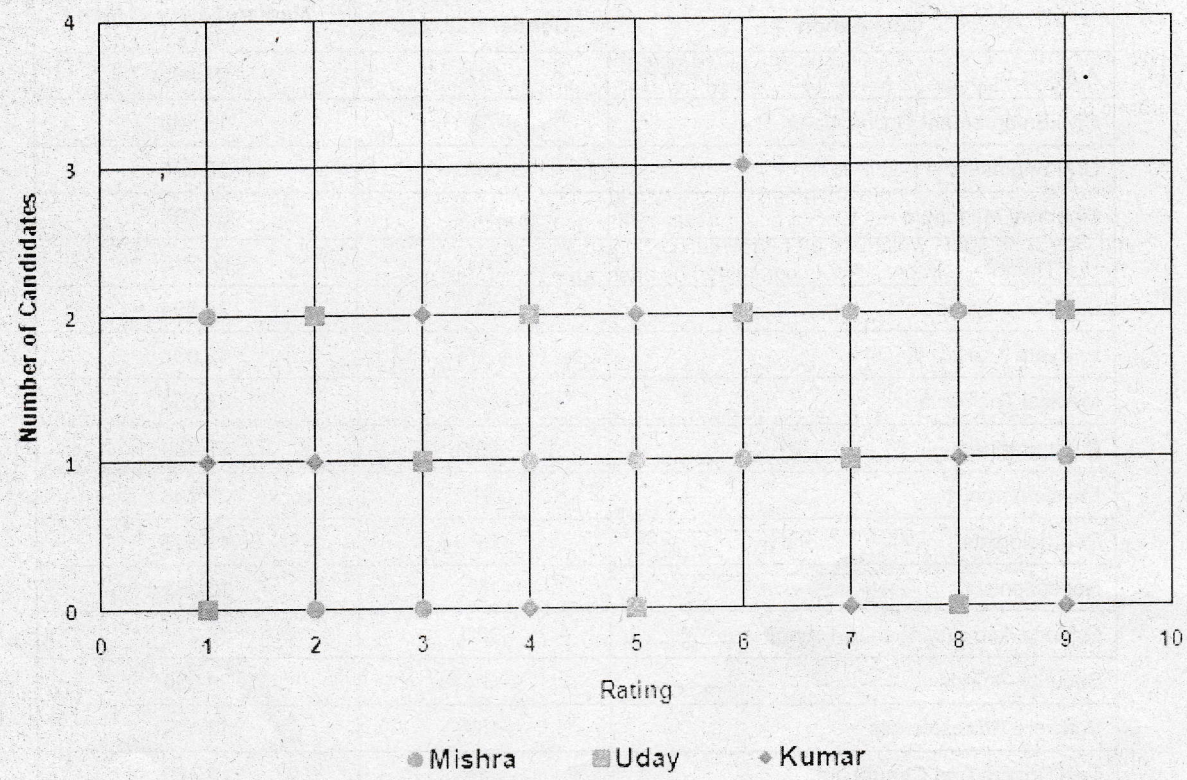
7. Which of the following teams could not have scored the first goal in its match, if it is known that no team scored consecutive goals in any match?
(A) Liverpool
(B) Chelsea
(C) Arsenal
(D) More than one of the above

8. If every *shot on goal* by a team that is not blocked by the opponents' goalkeeper converts into a *goal*, then the goalkeeper of which team blocked the maximum percentage of *shots on goal* that came his way?
(A) Liverpool (B) Chelsea
(C) Manchester United (D) Arsenal

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

In an interview panel for admission to an MBA college, there were three panel members – Mishra, Uday and Kumar. During the interview, the three panel members individually rated each candidate on a scale of 1 to 10 and at the end of the interview, the final score of a candidate is calculated as the average of the ratings given by the three panel members. On a particular day, ten candidates – A through J – appeared for the interview. However, none of the ten candidates received a final score greater than 8.

The following scatter chart shows the number of candidates for whom a particular rating was given by each panel member and the table below it presents partial information regarding the ratings given by each panel member to each candidate:



	A	B	C	D	E	F	G	H	I	J
Mishra				8	6					
Uday			6			9				2
Kumar	6	1		8	3		5		3	
Final Score	**4**	**3.33**	**6.67**		**4**	**7**	**4**	**5**		**3**

DIRECTIONS *for questions 9 to 11:* Type in your answer in the input box provided below the question.

9. What is the rating given by Uday to I?

10. How many candidates received the same rating from at least two of the three panel members?

11. For how many candidates was the rating given by any of the panel members not greater than 7?

DIRECTIONS *for question 12:* Select the correct alternative from the given choices.

12. What is the highest final score received by a candidate?
(A) 7 (B) 7.33 (C) 7.67 (D) 8

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

In a survey conducted in the UK in 2014, it was found that there was a difference between the Median Salary paid to men and that paid to women in various occupations. This gap in pay for a particular occupation is called the Gender Pay Gap for that occupation and it is calculated as the Median Salary of women minus the Median Salary of men, with the difference being expressed as a percentage of the Median Salary of the men. The table below provides the Median Salary for men and the Gender Pay Gap for a few occupations:

Occupation	Gender Pay Gap	Median Salary of Men (in £)
Authors	13%	27,889
Civil Enforcement Occupations	7%	18,630
Civil Engineers	–22%	38,906
Financial Managers	–37%	66,000
IT Directors	5%	60,215
Lab Technicians	–34%	24,094
Lawyers	–12%	42,998
Medical Technicians	–30%	28,853
Photographers	–29%	27,139
Physiotherapists	–9%	28,793
Psychologists	–18%	43,842
Receptionists	–10%	13,281
Science And Engineering Technicians	–32%	29,271
Security Guards	–3%	20,096
Software Professionals	–15%	40,145
Taxi Drivers And Chauffeurs	–41%	19,270
Teachers	–18%	36,971
Town Planning Technicians	5%	27,725
Vehicle Valets	4%	14,632
Welfare Professionals	13%	25,719

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

13. For which occupation is the median salary for women the second highest?
(A) IT Directors
(B) Financial Managers
(C) Lawyers
(D) None of the above

14. For how many occupations is the median salary of women less than £25,000?
(A) 8 (B) 9 (C) 10 (D) 11

15. Among the occupations in which the median salary of women is less than £20,000, what is the highest difference between the median salary of men and that of women, approximately?
(A) £7,870 (B) £7,901
(C) £8,192 (D) £9,367

16. If there was a revision in the salaries of women in 2015, because of which the median salary of female lawyers increased by 10% as compared to the previous year, while the median salary of male lawyers remained the same as that in the previous year, what was the Gender Pay Gap for Lawyers in 2015?
(A) –3.20% (B) –3.31%
(C) 3.20% (D) 3.31%

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

Eight persons – Ashish, Badri, Chetan, Gautam, Joseph, Karthik, Lalit and Manish – are sitting around a circular table which had eight equally spaced seats around the table. The following information is known about their seating arrangement:

(i) If Ashish and Karthik exchanged places, Karthik would be sitting to the left of Badri.
(ii) If Lalit and Badri exchanged places, Badri would be sitting opposite Gautam.
(iii) If Chetan exchanged places with the person to the left of Joseph, Chetan would be sitting opposite Manish.
(iv) If the person sitting to the left of Ashish and the person sitting to the left of Chetan exchanged places, Ashish would be sitting opposite Manish

DIRECTIONS *for questions 17 to 19:* Select the correct alternative from the given choices.

17. Who is sitting opposite Karthik?
(A) Ashish
(B) Manish
(C) Badri
(D) Cannot be determined

18. If Gautam is sitting adjacent to Manish, who is sitting to the right of Lalit?
(A) Badri
(B) Karthik
(C) Ashish
(D) Joseph

19. Which of the following pairs of people are definitely sitting adjacent to each other?
(A) Badri, Lalit
(B) Joseph, Manish
(C) Gautam, Ashish
(D) Ashish, Manish

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

20. In how many ways could the eight persons be sitting around the table?

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

Ravi had a calculator which had ten digits and all the basic mathematical operators. He decided to clean the calculator by removing all the keys and while reassembling it, he interchanged the locations of three pairs of keys. For example, if he placed the key '9' in the place of the key '6', he placed the key '6' only in the place of the key '9' and not any other key. All the six keys that were interchanged corresponded only to numbers and not to any mathematical operators. Later, he input some calculations and obtained outputs as provided in the table below. The input is shown in terms of the keys that Ravi pressed, while the output is the output displayed by the calculator.

Input	Output
128 + 64	195
912 + 43	942
95 + 84	128
178 + 19	192

DIRECTIONS *for question 21:* Select the correct alternative from the given choices.

21. The key of which of the following numbers was not interchanged with any other number in the calculator?
(A) 2 (B) 3 (C) 5 (D) 7

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

22. What will be the output if Ravi inputs'314 + 470' in the calculator?

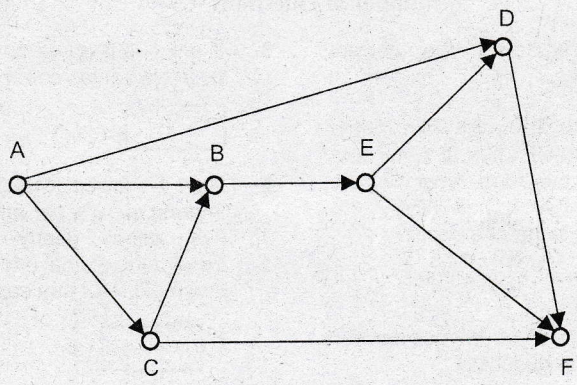
DIRECTIONS *for questions 23 and 24:* Select the correct alternative from the given choices.

23. For which of the following numbers will the output of the calculator be the same as the input?
(A) 958 (B) 674
(C) 423 (D) 107

24. Which of the following, if input into the calculator, will have the same output as that when 123 + 456 is input into the calculator?
(A) 189 + 981 (B) 132 + 480
(C) 439 + 142 (D) 158 + 420

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

Six towns – A through F – are connected by roads as shown in the figure below. The arrows represent the direction in which people can travel.



On a particular day, 100 people started from A and reached F passing through different towns in between. However, no person passed through the same town twice. Further, it is also known that

(i) the number of people who passed through town B is twice the number of people who passed through D.
(ii) the number of people who travelled on the road connecting town C and town B is one fourth the number of people who travelled on the road connecting town D and town F.
(iii) the number of people who travelled on the road connecting town B and town E is double the number of people who passed through town C.
(iv) exactly 64 people passed through town E.

DIRECTIONS *for question 25:* Type in your answer in the input box provided below the question.

25. How many people travelled through town D?

[ ]

DIRECTIONS *for questions 26 and 27:* Select the correct alternative from the given choices

26. Which of the following routes was taken by the maximum number of people?
(A) ABEF (B) ADF
(C) ACBEDF (D) ACF

27. Among the following roads, on which road did the maximum number of people travel?
(A) The road connecting Town E and Town F
(B) The road connecting Town C and Town F
(C) The road connecting Town C and Town B
(D) The road connecting Town E and Town D

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

28. What is the number of people who travelled on the road connecting Town D and Town F?

[ ]

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

Tarun, a storekeeper, sells pen drives of four different capacities, 8 GB, 16 GB, 32 GB and 64 GB, the prices of which are ₹200, ₹350, ₹650 and ₹1100 respectively.

At the beginning of a day, Tarun had with him ₹1450. During the day, exactly six customers – Amar, Karan, Lolly, Mithun, Naveen and Pavan – visited his store at different times and together purchased three 8 GB pen drives, three 16 GB pen drives, two 32 GB pen drives and two 64 GB pen drives. Each of the six customers purchased at least one pen drive and they paid for the pen drives using cash. Further, it is also known that,

(i) while Tarun had ₹5750 with him after Lolly paid for his purchase, he had ₹4300 after Amar paid for his purchase.
(ii) Amar and Naveen were the only ones to purchase one pen drive each, while Mithun did not purchase a 32 GB pen drive.
(iii) Karan purchased two pen drives of the same capacity and after he paid for his pen drives, Tarun had ₹2350 with him.
(iv) Pavan was the last person to visit the store and the capacity of none of the pen drives that he purchased was the same as the capacity of any of the pen drives that Lolly purchased.

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

29. What is the total capacity of the pen drives purchased by Karan?
(A) 16 GB (B) 32 GB
(C) 64 GB (D) 128 GB

30. Who spent the maximum amount on purchasing the pen drives?
(A) Mithun (B) Pavan
(C) Karan (D) Lolly

31. Who among the following purchased a 32 GB pen drive?
(A) Naveen (B) Lolly
(C) Amar (D) Karan

32. What is the average amount spent by each person in purchasing the pen drives?
(A) ₹1100 (B) ₹1004.67
(C) ₹858.33 (D) ₹825

SECTION – III
Number of Questions = 34

DIRECTIONS *for question 1:* Select the correct alternative from the given choices.

1. Amar has chocolates worth ₹20 with him, while Akbar has biscuits worth ₹30 with him. If Amar and Akbar exchange the items that they have, Amar will have twice the number of items that Akbar has. What is the ratio of the price of a chocolate to that of a biscuit?
(A) 3 : 4 (B) 4 : 5
(C) 4 : 3 (D) 5 : 4

DIRECTIONS *for questions 2 to 4:* Type in your answer in the input box provided below the question.

2. A shopkeeper marks up the price of a pen by 20% and sells the pens individually or in packs of 20. Further, he gives a 10% discount on a pack of 20 pens. If Tarun bought two packs of pens and five individual pens for a total of ₹492, what is the cost price of a single pen?

₹ [ ]

3. If $a + b$ is a prime number and $ab = 84$, how many possible values can $a + b$ assume?

[ ]

4. Ravi borrowed ₹10000 from a bank at a simple interest of 10% per annum. If Ravi repaid his loan in five equal yearly instalments, paying each instalment at the end of the respective year, how much did Ravi pay each year?

₹ [ ]

DIRECTIONS *for question 5:* Select the correct alternative from the given choices.

5. The quadratic equation whose roots are the reciprocals of the roots of $3x^2 + 4x + 2 = 0$ is
(A) $2x^2 + 4x + 3 = 0$.
(B) $2x^2 - 4x + 3 = 0$.
(C) $2x^2 - 3x - 3 = 0$.
(D) $2x^2 + 4x - 2 = 0$.

DIRECTIONS *for question 6:* Type in your answer in the input box provided below the question.

6. If x and y are positive and $x^6y^4 = 1024$, find the minimum value of $12x + 8y$.

[ ].

DIRECTIONS *for question 7:* Select the correct alternative from the given choices.

7. The sum to infinity of the series $-1+\frac{1}{2\times3}+\frac{5}{4\times9}+\frac{19}{8\times27}+\frac{65}{16\times81}....$ is

(A) $\frac{1}{2}$. (B) $\frac{13}{2}$.

(C) $-\frac{1}{2}$. (D) $-\frac{13}{2}$.

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

8. If the average of the first five terms of an arithmetic progression is 4 and the average of the first ten terms is 9, what is the fifteenth term of the progression?

[ ]

DIRECTIONS *for questions 9 to 13:* Select the correct alternative from the given choices.

9. How many four-digit numbers divisible by 9 can be formed by using exactly two distinct digits?

(A) 26 (B) 42

(C) 69 (D) 56

10. If $f(x) = 13 + |x - 16|$ and $g(x) = 2+\frac{1}{f(x)}$, what is the maximum value of $g(x)$?

(A) 2 (B) $\frac{27}{13}$

(C) $\frac{28}{13}$ (D) $\frac{29}{13}$

11. If three runners, A, B and C, start simultaneously from the same point and run around a circular track of length 500 m, in the same direction, at speeds of 5 kmph, 8 kmph and 15 kmph respectively, what is the time taken by them to meet for the first time?

(A) 60 minutes (B) 30 minutes

(C) 15 minutes (D) 10 minutes

12. If four men and three women can finish a job in 10 days and five men alone can finish the same job in 12 days, how long will it take eight men and two women to finish the job, if the two women are scheduled to join after exactly half the work is finished?

(A) $\frac{193}{28}$ days (B) $\frac{180}{28}$ days

(C) $\frac{197}{28}$ days (D) $\frac{195}{28}$ days

13. Three numbers, a, b and c, are in the ratio 5 : 6 : 13. If $2a + 5b = 10$, then find the value of $a + b + c$.

(A) $\frac{9}{2}$ (B) 5 (C) $\frac{11}{2}$ (D) 6

DIRECTIONS *for questions 14 to 16:* Type in your answer in the input box provided below the question.

14. If $\sqrt{19}+\sqrt{14}=\sqrt{a+\sqrt{b}}$, then the value of $a + b$ is

[ ].

15. The average marks of ten students in a test, comprising ten questions carrying one mark each, without any negative marks for incorrect answers or unattempted questions, was 4.4. However, one question was eventually removed from evaluation, because of which the average became 3.8. How many students had not earned any marks for the question that was removed?

[ ]

16. What is the largest number which leaves remainders of 4, 6 and 2 when it divides 460, 690 and 990 respectively?

[ ]

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

17. If the product of three consecutive natural numbers is $153n$, find the minimum possible value of n.

(A) 2 (B) 32

(C) $\frac{80}{3}$ (D) None of the above

18. What is the remainder when the number $(232)_6$ is divided by $(120)_4$?

(A) $(201)_3$ (B) $(26)_7$

(C) $(22)_8$ (D) $(21)_9$

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

19. A bag contains balls of only two colours, Blue and Red. The ratio of the number of blue balls to the number of red balls in the bag is 5 : 6. If two red balls are taken out of the bag, the ratio becomes 10 : 11. What is the total number of balls in the bag initially?

[ ]

DIRECTIONS *for questions 20 and 21:* Select the correct alternative from the given choices.

20. If the cost of three pencils and six erasers is ₹24 and the cost of a pencil is 20% more than that of an eraser, what is the cost of one pencil?

(A) ₹2.5 (B) ₹3

(C) ₹3.5 (D) ₹4

21. Tarun and Raghu started a business with investments of ₹15000 and ₹18000 respectively. Four months later, Umesh joined the business with an investment of ₹12000. If Raghu left the business one month after Umesh joined, what is the ratio in which Tarun, Raghu and Umesh share the profits at the end of the first year?

(A) 10 : 8 : 5 (B) 20 : 18 : 16
(C) 15 : 12 : 10 (D) 30 : 15 : 16

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

22. If the average monthly income of Viru in a year was ₹25000 and he earned an average of ₹23000 per month from January to October of that year, what was his average monthly income for the remaining months of that year?

₹ ☐

DIRECTIONS *for questions 23 and 24:* Select the correct alternative from the given choices.

23. Two vessels contain milk and water in the ratio 9 : 4 and 3 : 7 respectively. In what ratio should the contents of these vessels be mixed, if the resultant mixture should contain milk and water in the ratio 10 : 11?

(A) 69 : 48 (B) 68 : 49
(C) 590 : 481 (D) 481 : 590

24. If $x = \cfrac{1}{4 - \cfrac{1}{4 + \cfrac{1}{4 - \left(\cfrac{1}{4 + \ldots \infty}\right)}}}$, find the value of x.

(A) $\frac{\sqrt{65} - 7}{4}$ (B) $\frac{-7 - \sqrt{65}}{4}$
(C) $7 - 3\sqrt{5}$ (D) $3\sqrt{5} - 7$

DIRECTIONS *for question 25:* Type in your answer in the input box provided below the question.

25. If $\frac{2\log m}{\log n} + \frac{3\log mn}{2\log n} = 2$, and $n = m^k$, then find k.

☐

DIRECTIONS *for questions 26 and 27:* Select the correct alternative from the given choices.

26. If $p \Psi q = \frac{p}{q^2 - 1}$, then find the value of $3 \Psi (4 \Psi 5)$.

(A) $-\frac{108}{35}$ (B) $-\frac{98}{35}$
(C) $-\frac{36}{35}$ (D) $-\frac{78}{35}$

27. Find the area of the quadrilateral whose vertices are (4, 0), (5, 6), (10, 6) and (12, 0) respectively.

(A) 39 sq. units (B) 52 sq. units
(C) 65 sq. units (D) 78 sq. units

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

28. If x and y are distinct prime numbers less than 30, how many ordered pairs (x, y) satisfy the inequality $4x + y > 100$?

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DIRECTIONS *for question 29:* Select the correct alternative from the given choices.

29. Everyday, Ramu starts from his school at the same time, walks home at a speed of 4 kmph and reaches home at 5:00pm. If he walks at a speed of 5 kmph instead, he will reach home at 4:45 pm. At what time does Ramu start from the school everyday?

(A) 3:30 pm (B) 3:45 pm
(C) 4:00 pm (D) 4:15 pm

DIRECTIONS *for question 30:* Type in your answer in the input box provided below the question.

30. If the roots of the equation $(x - p)(x - q) + r = 0$ are 4 and 5, where p, q and r are non-zero positive integers, then what is the highest possible value of r?

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DIRECTIONS *for question 31:* Select the correct alternative from the given choices.

31. If a cube of side 22 cm is melted and recast to form a sphere, what will be the radius of the sphere? (Assume $\pi = \frac{22}{7}$)

(A) $\sqrt[3]{2541}$ cm (B) $\sqrt[3]{2514}$ cm
(C) $\sqrt[3]{2451}$ cm (D) $\sqrt[3]{2415}$ cm

DIRECTIONS *for question 32:* Type in your answer in the input box provided below the question.

32. What is the last digit of $258^{35} + 393^{58}$?

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DIRECTIONS *for questions 33 and 34:* Select the correct alternative from the given choices.

33. What is the area of the circumcircle of a right angled triangle whose base is 5 cm and height, 12 cm?

(A) 42.25π sq.cm. (B) 144π sq.cm.
(C) 169π sq.cm. (D) 84.5π sq.cm.

34. Karthik invested in a stock, the price of which first increased by 30% and then decreased by 20%. What will be Karthik's gain/loss percentage, if he sold the stock after the price decrease?

(A) 4% loss (B) 4% gain
(C) 6% gain (D) 6% loss