

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

Economists can be divided into four almost separate groups. In one group we find the pure theorists, many of whom refer to themselves as mathematical economists. In another group the pure econometricians reside. Most of their work belongs in the realm of mathematical statistics. In a third group we find applied economists and applied econometricians, whose published work usually reports results from the analysis of economic data. Finally, in the fourth group reside “all the others” – for example, government policy makers, economic consultants, and bank employees. Their work is guided by methodological considerations that are of little interest here. Each of the other three groups has a methodological basis for their members’ work that is inadequate for an orderly development of the science of economics.

The pure theorists’ methodological basis is identical with the methodological basis of nonintuitionistic mathematics... This methodological basis may be adequate for the development of pure mathematics, but it is sorely inadequate for developing economic theory. To wit: Mathematics is created out of the empty set, and its assertions concern properties of symbols. Mathematicians interpret their symbols to see if their axioms are consistent. The symbols then become sets to some and real numbers to others. Mathematical economists also interpret their symbols – the undefined terms of their theories – to check whether their axioms are consistent. The symbols then become, say, money and capital. But “money” and “capital” are symbols just as much as x and y are symbols, and symbols per se are of no interest in economics. To be adequate, an interpretation of the symbols of an economic theory must describe at least one situation in which the empirical relevance of the theory can be tested. The methodological basis of mathematics provides no guidelines for formulating such an interpretation. The methodological basis of the work of the applied economists and econometricians is described in Trygve Haavelmo’s seminal treatise *The Probability Approach in Econometrics* (1944). There Haavelmo delineates the relationship between abstract economic theories and economic reality, discusses the nature of stochastic models and their applicability to economic data, and outlines a general scheme for testing economic theories. Haavelmo’s unquestioned authority and the profoundness of his arguments notwithstanding, I believe that the methodological basis that he constructed for applied economics and econometrics is inadequate because it does not provide economic researchers with a formal theoretical apparatus that can guide them in formulating their statistical models and provide them with an easy means of checking whether their arguments are sound. Evidence of the need for such an apparatus is the ample supply of meaningless estimates of statistical parameters in economic journals.

The pure econometricians' methodological basis is the methodological basis of nonintuitionistic mathematics. This basis may suffice for mathematical statistics, but it is inadequate for a meaningful development of econometrics. Econometrics is the theory of how to measure economic relations. Philosophical problems concerning the possibility of economic knowledge are as much a part of econometric theory as the asymptotic properties of parameter estimates and the power of statistical tests. Since the methodological basis of mathematics is not equipped to deal with philosophical problems, it is inadequate for the purposes of econometrics.

Q1. Why does the author say that the methodological basis of mathematics is inadequate for developing economic theory?

- a) The symbols used in mathematics are undefined terms of its theories, while the symbols used in economic theory are not undefined.
- b) The methodological basis for mathematics does not help in formulating statistical models.
- c) The methodological basis for mathematics is unsuitable to verify whether a theory has any empirical relevance.
- d) The methodological basis for mathematics does not concern itself with the philosophical problems intrinsic to economics.

Q2. According to the author, which of the following aspects is not mentioned in the passage as being addressed by Haavelmo in *The Probability Approach in Econometrics*?

- a) The applicability of stochastic models for analysing economic data.
- b) Testing the reliability of an economic theory.
- c) The relationship between economic theories and economic reality.
- d) The advantages that stochastic models have as compared to other statistical models for studying economic data.

Q3. Which of the following can be inferred from the statement "Evidence of the need... in economic journals"?

- a) It is not possible for economists to have their economic theories tested.
- b) There isn't any notable framework which provides guidelines for formulating statistical models in economics.
- c) When developing a statistical model for studying economic data, econometricists select variables unrelated to the data at hand.
- d) The theoretical apparatus for formulating statistical models that Haavelmo provided in his work is inadequate.

Q4. According to the author, how should the methodological basis of a pure econometrician be different from that of a nonintuitionistic mathematician?

- a) The statistical tests used in econometrics must be more rigorous than those used in nonintuitionistic mathematics.
- b) The statistical tests used in econometrics must include epistemological variables which are not present in the statistical tests used in mathematics.
- c) The methodological basis of econometrics must be able to deal with epistemological problems, which is not in the realm of nonintuitionistic mathematics.
- d) The methodological basis of pure econometrics should be the same as the methodological basis of pure econometricians.

Q5. The author mentions that the methodological basis of mathematics is inadequate for which of the following groups of economists?

- I. Pure theorists
- II. Pure econometricians
- III. Applied econometricians
- IV. Applied economists
- V. Policy makers

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

Q6. According to the passage, what is the difference between pure econometricians and applied econometricians?

- a) Applied econometricians deal with the statistical analysis of real world economic data, while the pure econometricians are not concerned with economic data from the real world.
- b) Applied econometricians use the statistical models that pure econometricians design but do not formulate any statistical models on their own.
- c) Pure econometricians concentrate on measurement of economic relations, while applied econometricians work more with analysis of economic data.
- d) Pure econometricians deal with the philosophical aspects of econometrics while applied econometricians deal with the statistical aspects.

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.

Many writers on art have claimed that photography is inherently realistic. Since this medium operates mechanically to produce images through the use of light, chemistry, and machinery, it is alleged that photographic depiction can occur without the intervention of artistic intentions, and that the results possess unusual veracity. On this view, photographs are emanations from their subject matter or little bits of reality rather than representations of it. They serve as testimonials; it is pointed out that photographs, but not paintings, are used as evidence. Sonograms are first proof of a new human life and children's school pictures document their changing appearance over the years. At the other end of the spectrum, photographs of the dead at funerals show us that the deceased person existed until only recently.

But discussions of photographic realism seem to involve an important ambiguity. In one sense, to speak of a photograph's realism is to assert something about the image's *epistemic value*, implying that it has a particular kind of accuracy or that it is a truthful representation. Here the causal origin of the image is relevant, since it links photographs to other kinds of signs that show a direct causal link to their source, such as X-rays or electrocardiograms. Such signs may even be found in nature, as in the case of measles spots, teeth marks, footprints, or blood spatters at murder scenes. These indicative marks are what C. S. Pierce would call indexical signs; they may not be images at all. They will not present a "picture" directly to our eyes unless we are experts trained at interpreting them.

In this second sense, the label "realistic" characterizes the *psychological force* or emotional persuasiveness of certain images. They seem to present something directly to our eyes in a particularly vivid and lifelike way. When I view a photograph of my dead grandmother, it seems as if she is smiling directly at me. But images made in other media can be realistic in this psychological sense without being literally accurate or mechanically caused in the way photographs are. ...

The ambiguity in the label "realistic" can be understood to reflect a fundamental difference in the way photographs and other images are commonly used. In his

book *The Engine of Visualization: Thinking through Photography*, Patrick Maynard draws a distinction much like what I have in mind between the two senses of realism, but he describes it in terms of how images actually function. Maynard speaks of the difference between an image's "depictive" or representational function and its "manifestation" function.

Maynard traces these two functions of photographs back to sources within two distinct traditions of image-making in Europe. In the West, art associated mainly with Catholicism developed forms of ever more naturalistic, illusionistic depiction. On the other hand, in Eastern Orthodox realms, emphasis was instead placed upon icons as hieratic images revealing some

holy person's manifestation. Such manifestation has less to do with effecting a realistic likeness than with supplying the viewer /with a sense of contact or presence with the represented subject. Insofar as a photographic image functions today to supply a similar sense of contact or manifestation, Maynard says, it "resembles an earlier and prolific, important sort of image, an icon: 'an image whose *function* is largely that of manifesting what it depicts and thereby providing realism through the sense of presence.'"

Q7. Which of the following are examples of realistic images in other media referred to in the last sentence of the third paragraph?

1. A photo realistic painting of a deceased grandmother of a person.
2. A realistic painting of a garden as the painter recollects it.
3. An abstract painting which evokes a multitude of feelings in the viewer.
4. A photograph taken in a battlefield depicting the pain and suffering of the soldiers fighting in the battle.

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

Q8. It can be inferred from the passage that *epistemic value* of an image most probably

- a) is central to art in Eastern Orthodox realms.
- b) is what makes an image affect us emotionally.
- c) is significant in art associated with Western Europe.
- d) stems from the unreal nature of the image.

Q9. According to the passage, which of the following can be inferred to be a reason why "photographs, but not paintings, are used as evidence"?

- a) It is believed that photographs can represent reality while paintings cannot.
- b) Photographs will not include any artistic intentions but paintings will always include artistic intentions.
- c) Photographs possess a psychological force which paintings usually do not.

d) Photographs are considered pieces of reality while paintings are considered mere representations of reality.

Q10. Which of the following options best defines “indexical signs” as can be inferred from the passage?

- a) A sign which is assigned arbitrarily and is accepted as a social convention.
- b) A sign which has a causal connection with what it signifies.
- c) A sign which possesses some of the qualities of the signified object.
- d) A sign which is responsible for the causation of the signified object.

Q11. Which of the following will diminish the epistemic value that photographs are believed to possess?

- a) The ability to paint photo realistic paintings.
- b) The ability to capture intricate details through photography.
- c) The ability to photograph activity inside a human brain.
- d) The ability to digitally alter photographs.

Q12. According to Maynard, which of the following is true from the last paragraph of the passage?

- a) Art was associated with naturalistic depiction in the Western world, while in the Eastern world, naturalistic depiction is not so central to art.
- b) Icons were central to art in the Western world, while they were not in the Eastern world.
- c) In Western European art, a sense of presence provides realism to art, while in Eastern European art, realistic likeness was considered more important.
- d) Western European art concentrated on realism, while in Eastern European art, creating a sense of presence in the viewer was considered central.

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.

“Every novel is an ideal plane inserted into the realm of reality; Cervantes, who wrote *Don Quixote*, takes pleasure in confusing the objective and the subjective, the world of the reader and the world of the book. In those chapters of *Don Quixote* which argue whether the barber's basin is a helmet and the donkey's packsaddle a steed's fancy regalia, the problem is dealt with explicitly; other passages, as I have noted, insinuate this. In the sixth chapter of the first part, the priest and the barber inspect *Don Quixote's* library; astoundingly, one of the books examined is Cervantes'

own *Galatea* and it turns out that the barber is a friend of the author and does not admire him very much, and says that he is more versed in misfortunes than in verses and that the book possesses some inventiveness, proposes a few ideas and concludes nothing. **The barber, a dream or the form of a dream of Cervantes, passes judgment on Cervantes. . . .**

This play of strange ambiguities culminates in the second part; the protagonists have read the first part, the protagonists of Don Quixote are, at the same time, readers of Don Quixote. Here it is inevitable to recall the case of Shakespeare, who includes on the stage of Hamlet another stage where a tragedy more or less like that of Hamlet is presented; the imperfect correspondence of the principal and secondary works lessens the efficacy of this inclusion. Something similar is created by accident in *The Thousand and One Nights*.

The Thousand and One Nights is an overdetermined narrative of magic, adventure, parable and poetry that, duplicates and reduplicates to the point of vertigo the ramifications of a central story in later and subordinate stories, but does not attempt to gradate its realities, and the effect (which should have been profound) is superficial, like a Persian carpet. The opening story of the series is well known: the terrible pledge of the king who every night marries a virgin who is then decapitated at dawn, and the resolution of Scheherazade, who distracts the king with her fables until a thousand and one nights have gone by and she shows him their son. The sheer length of the piece obliged the story's many copyists over the centuries to make numerous interpolations, one of which marks a perturbing turn in this already vertiginous confection. This involves the story of the six hundred and second night, magical among all the nights. On that night, the king hears from the queen his own story. He hears the beginning of the story, which comprises all the others and also, monstrously itself. So the heroine Scheherazade contrives an elaborate metafiction that potentially unhinges its internal drama. By drawing into her narrative the beginning of the story, what brought her there in the first instance, all the stories told her king hitherto and – monstrously – that story she is telling itself, does the reader clearly grasp the vast possibility of this interpolation, the curious danger? That the queen may persist and the motionless king hear forever the truncated story of *The Thousand and One Nights*,

The inventions of philosophy are no less fantastic than those of art: Josiah Royce, in the first volume of his work *The World and the Individual* (1899), has formulated the following: "Let us imagine that a portion of the soil of England has been leveled off perfectly and that on it a cartographer traces a map of England. The job is perfect; there is no detail of the soil of England, no matter how minute, that is not registered on the map; everything has there its correspondence. This map, in such a case, should contain a map of

the map, which should contain a map of the map of the map, and so on to infinity."

Why does it disturb us that the map be included in the map and the thousand and one nights in the book of *The Thousand and One Nights*? Why does it disturb us that Don Quixote be a reader of the *Quixote* and Hamlet a spectator of *Hamlet*? I believe that these inversions suggest that if the characters of a fictional work can be readers or spectators, we, its readers or spectators, can be fictitious.

Q13. Which of the following choices best captures the central theme of the passage?

- a) Fiction can delve into the domain of reality.
- b) Works of philosophy and art both involve a judicious use of fantasy.
- c) There can be a vice versa relationship between fiction and the readers of the story.
- d) Conflationary elements in novels can make for palatable or normative fiction.

Q14. What is the primary purpose that "*The Thousand and One Nights*" excerpt serves in the passage?

- a) It includes a parallel point of discussion to justify the central theme.
- b) It establishes a correlation with the 'barber' example.
- c) It strengthens the paradox evident in the last sentence of para 4.
- d) It brings in themes from history to add an exclusive outlook to the passage.

Q15. Which of the following choices best completes the blank in the last sentence of para 3?

- a) now coherent and complete.
- b) now infinite and circular.
- c) now irregular and insane.
- d) now hesitant and fluctuating.

Q16. How many of the following statements can be understood to be true from the passage?

Enter the appropriate number in the input box given below the question.

1. The overdetermined interplay of the real with the imaginary forges ideology as a process that is apparently conflationary rather than contradictory.
2. Shakespeare's Hamlet is mentioned in the passage to portray the characters of Hamlet as spectators.
3. The *Galatea* by Cervantes finds a mention in his other work, *Don Quixote*, where it is disparaged by one of the characters, himself a creation of Cervantes.
4. The boldface sentence serves as a prelude to what comes next in the passage: how different works/ characters insert a world within another.
5. The Persian Carpet is mentioned in the passage to represent stylized symbolic imagery common to a woven carpet and to various superficial stories that are spun together.

Q17. All of the following are true about *The Thousand and One Nights* EXCEPT?

- a) The king takes, as bride, a virgin every night and has her slain the next morning.
- b) Having married the king, Scheherazade succeeds in entertaining the king with her stories for a thousand and one nights.
- c) Several supporting stories attempt to reiterate and follow the impact of the principal plot but it turns out that the latter is given a perfunctory treatment.
- d) The sheer length of the piece led to the preclusion of perturbing elements from the sequence of events.

Q18. Which of the following would describe the relationship between the subjective and objective in the works of fiction mentioned in the passage?

- a) The subjective serves as a reflection of the objective, sometimes vague or incomplete.
- b) The subjective is the world of the reader and the objective is the world of the novel/ text/ authorial power.
- c) The subjective is emboldened by the objective and then both of them work in tandem in tracing an infinite tunnel.
- d) The subjective examines the introspective nature of prose which helps engage its readers while the objective demonstrates how writers critique themselves through their work.

DIRECTIONS for questions 19 to 21: The passage given below is followed by a set of three questions. Choose the best answer to each question. For years, techies have argued that getting an extra monitor or two for your desktop computer is an especially effective way to increase personal productivity. The logic seemed airtight: Two (or more) computer monitors means more room on your virtual desktop, which means more room to do your work. And more room to work would seem to mean faster work. Even science seemed to agree. As the price of computer monitors plummeted over the last decade, studies showed that increasing display size increased people's productivity. It didn't seem to matter that the research was sponsored by NXC. Now two-monitor setups, once the rarefied domain of Wall Street and Silicon Valley, have become *de rigueur* in office parks across America. ...

In a switch that amounts to heresy among some techies, I've become a two-screen skeptic. Two months ago, about five years after becoming an ardent proselytizer for the Church of the Second Display, I turned off the extra screen on my desktop computer. At first, the smaller workspace felt punishingly cramped. But after a few days of adjusting to the new setup, an unusual serenity invaded my normally harried workday. With a single screen that couldn't accommodate too many simultaneous stimuli, a screen just large enough for a single word processor or browser window, I found something increasingly elusive in our multi screen world: focus.

Unlike monitor makers with their multi display studies, I have no research proving you'll find as much benefit from a single monitor as I did. But research from another academic domain, the study of how we focus in increasingly addled workplaces, suggests my experience might not be unusual. While extra monitors might increase productivity in certain situations — the sort of situations that can be easily tested in a research setting — they seem to do so at a high cost, by displaying a stream of digital splendors, constantly vying for your attention.

Q19. Which of the following is most probably true regarding NXC from the second paragraph of the passage?

- a) It is in the interest of NXC that people should not use two-monitor setups.
- b) NXC is a company whose primary source of revenue is from the sale of computer monitors.
- c) NXC stands to benefit if people use an additional monitor for their desktop computer.
- d) NXC is interested in increasing the productivity of the workforce across the country.

Q20. According to the passage, which of the following is most likely a disadvantage of working with a two-screen setup?

- a) Having two screens results in increased strain on our eyes.
- b) Large amount of visible information increases the chances of getting distracted
- c) Extra monitors do not result in increased productivity.
- d) It is easier to organize our work when using a single monitor rather than when using two monitors.

Q21. It can be understood from the passage that the author

- a) used a two-screen setup for around five years before switching to a single screen setup.
- b) believes that a two-screen setup is better for getting his work done.
- c) used a two-screen setup for well over five years before switching to a single screen setup.
- d) strongly recommended using a two-screen setup for around five years after which he himself switched to a single screen setup.

DIRECTIONS for questions 22 to 24: The passage given below is followed by a set of three questions. Choose the best answer to each question.

.... Then there is the extremely important phenomenon of polyploidy. Genes are aligned along chromosomes. Every kind of organism has its characteristic number and arrangement of chromosomes. Eggs and sperm (or the appropriate cells in ovules and pollen in case of plants) contain only one set of chromosomes, and is haploid. When they fuse in the act of fertilization, the resulting embryo has two sets of chromosomes and is then diploid. Human beings and chimpanzees are diploid.

Sometimes, the chromosome number will double (as they normally do in preparation for cell division) but the cell fails to divide. The diploid cell becomes tetraploid with four sets of chromosomes. The newly formed tetraploid organism can breed successfully with other tetraploids of its own kinds but it cannot breed successfully with either of its parents. So it forms an instant new species. ... The common potatoes grown in Europe are tetraploid derivatives of diploid potatoes that grow wild (and are cultivated) in the Andes. The octoploids form new species – unable to interbreed with the tetraploid parents that formed them.

Polyploid is the term that describes any organism with more than two sets of chromosomes. Sometimes the complications become too much even for the plants and they finish up with an odd number of chromosomes (some having been lost among all the cell divisions and matings). Plants with anomalous numbers of chromosomes are said to be 'aneuploid'. Unlike aneuploid animals who die or tend to be compromised if they live, plants put up with

aneuploidy. Sugarcane is aneuploid but that does not stop it being a vigorous major crop.

There is one further complication. Diploid organisms that are of different species mate to produce fully viable offspring. Usually such crosses fail, because the chromosomes of the two parents are incompatible. ... The cells will not produce sound gametes (eggs and sperm, or ovules and pollen) since this requires close cooperation between chromosomes.

But if a hybrid organism doubles its chromosomes, it often can produce viable gametes. So we find diploid parents of different species mating to produce diploid, hybrid offspring that are sterile; but the hybrids then double their chromosomes and become tetraploid – and the hybrid tetraploids are then fertile. This happens a lot among plants. Indeed the complications seem endless. A tetraploid plant may mate with a closely related diploid plant to produce a triploid offspring – two sets of chromosomes from the tetraploid parent and one set from the diploid parent. Triploids are sterile – they cannot produce gametes at all – but they may still form viable plants. Thus the cultivated banana is triploid. Because it is sterile, its fruits contain no seeds (as wild banana fruits do). So the domestic banana has to be produced vegetatively, by planting cuttings. Triploid hybrids double their chromosomes to become hexaploid (with six sets of chromosomes). The most famous and important hexaploid organism of all is bread wheat (pasta wheat is diploid). Among trees, Willows (genus *Salix*) and Acacias provide hundreds of examples of polyploid species.

Q22. According to the passage, what is responsible for the ‘complications’ mentioned in para 3?

- a) Lack of cell division accompanied by a doubling of the chromosome number.
- b) Mating.
- c) Cell division.
- d) Incompatible chromosomes.

Q23. The following pairs denote a plant/ animal mentioned in the passage and the status of the number of chromosomes.

In how many pairs is the number of chromosomes mentioned correctly for the given plant/ animal?

Enter the appropriate number in the input box given below the question.

1. European potatoes – octoploid
2. Wild bananas – triploid
3. Bread wheat – triploid hybrid
4. Pasta wheat – hexaploid
5. Sugarcane – aneuploid
6. Chimpanzees – haploid

Q24. Which of the following statements cannot be inferred to be true from the passage?

- a) The tetraploid organism cannot breed successfully with its diploid parents and the octoploid organism cannot breed successfully with its tetraploid parents.
- b) Aneuploid organisms like sugarcane are generally sterile and have to be cultivated vegetatively from planting cuttings.
- c) Diploid organisms of different species mate to produce sterile hybrid offspring which become fertile when they double their chromosomes.
- d) Bread wheat can have triploid hybrids as its parents that doubled their chromosomes, while the cultivated banana could have originated from a tetraploid plant and a diploid plant.

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 sequence as your answer in the input box given below the question.

- 1. The Extraditables was an organization created by Colombian drug lords in the early 1980s who mounted a campaign of violence to get Colombia to ban extradition.
- 2. "We prefer a grave in Colombia to jail in the United States."
- 3. This was because they feared that a prison sentence abroad meant doing real hard time.
- 4. That was the slogan of *Los Extraditables*.
- 5. At home they could run their businesses from behind bars until they escaped or bribed a judge into releasing them.

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 sequence as your answer in the input box given below the question.

- 1. Some engine part does not explode in a fiery bang. The rudder doesn't suddenly snap under the force of takeoff.
- 2. Plane crashes are much more likely to be the result of an accumulation of minor difficulties and seemingly trivial malfunctions.
- 3. In reality, the typical commercial jetliner – at this point in its stage of development – is about as dependable as a toaster.

4. Moreover, the captain doesn't gasp as he's thrown back against his seat.
5. Plane crashes rarely happen in real life the same way they happen in the movies.

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 sequence as your answer in the input box given below the question.

1. When someone feels he has been unjustly dealt with by an emotionally or socially significant person, it is very easy for him to become preoccupied with the injustice and make the other person the center of his life.
2. Nevertheless, enemy centering is very common, particularly when there is frequent interaction between people who are in real conflict.
3. Rather than proactively leading his own life, the enemy-centered person is counterdependently reacting to the behaviour and attitudes of a perceived enemy.
4. And what about putting an enemy at the center of one's life?
5. Most people would never think of it, and probably no one would ever do it consciously.

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 sequence as your answer in the input box given below the question.

1. Their English equivalents - "four" and "seven" are longer: pronouncing them takes about one-third of a second.
2. In other languages too, there is reproducible correlation between the time required to pronounce numbers in a given language and the memory span of its speakers.
3. Chinese number words are remarkably brief: most of them can be uttered in less than one-quarter of a second ("4" is "si" and "7" is "qi").
4. In this domain, the prize for efficacy goes to the Cantonese dialect of Chinese, whose brevity grants residents of Hong Kong a rocketing memory span of about 10 digits.
5. The memory gap between English and Chinese apparently is entirely due to this difference in length.

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 sequence as your answer in the input box given below the question.

1. In communist times a summer break usually meant a trip with workmates to a stony beach or a bracing mountainside--within the Soviet motherland.
2. Now the pleasure of holidaying closer to home is perforce being rediscovered by an ever-growing category of citizens.
3. As the Kremlin's extreme froideur with the West enters its second year, the number of *nevyezdniye* Russians may surpass 4m.
4. When the red flag came down, Russians flew off en masse on exotic forays to Turkey or Thailand.
5. To use a very Soviet term, these citizens are *nevyezdniye*: forbidden, by virtue of their state employment or access to secrets, from going abroad.

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. Coubertin had explained to the Committee members: "These three words represent a programme of moral beauty. The aesthetics of sport are intangible."
2. The Olympic motto is the hendiatis *Citius, Altius, Fortius*, which is Latin for "Faster, Higher, Stronger".
3. Some olympic symbols – such as the flame, fanfare, and theme – are more commonly used during Olympic competition, but others, such as the flags, can be seen throughout the year.
4. It was proposed by Pierre de Coubertin upon the creation of the International Olympic Committee in 1894 and was introduced in 1924 at the Olympic Games in Paris.
5. A more informal but well-known motto, also introduced by Coubertin, who got it from a sermon by the Bishop of Pennsylvania during the 1908 London Games, is "The most important thing is not to win but to take part!"

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. The triumph of a culture of honour helps to explain why the pattern of criminality in the American South has always been so distinctive.
2. The consensus reached is that that region was plagued by a particularly virulent strain of what sociologists call a “culture of honour.”
3. When lots of families fight with one another in identical little towns up and down the same mountain range, it’s a pattern.
4. When one family fights with another, it’s a feud.
5. What was the cause of the Appalachian pattern?

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. In these terms, Hopkins’ decades fighting guinea worm are the same as just over a year spent tackling smallpox.
2. With guinea worm it takes a year to know if you have been successful – or to learn if a missed case has infected the pond that supplies a town’s water.
3. With smallpox, the incubation period was two weeks, and every fortnight its nemesis Donald Hopkins could collect data and assess progress.
4. It is no coincidence that the countries where guinea worm remains are some of the most unstable and inaccessible.
5. There is another difficulty of eradicating guinea worm: time spent fighting a disease should not be measured in human years, but in the disease’s lifespan.

Q33. DIRECTIONS *for questions 33 and 34:* The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.

Conscience is the endowment that senses our congruence or disparity with correct principles and lifts us toward them – when it’s in shape. Just as the education of nerve and sinew is vital to the excellent athlete and education of the mind is vital to the scholar, education of the conscience is vital to the truly proactive, highly effective person. Training and educating the conscience, however, requires even greater concentration, more balanced

discipline of the mind and life, more consistently honest living.

- a) The voice of conscience is so delicate that it is easy to stifle it: but it is also so clear that it is impossible to mistake it.
- b) It requires regular feasting on inspiring literature, thinking noble thoughts and, above all, living in harmony with its still small voice.
- c) People who exist on that level aren't living; they are "being lived"; they are reacting, unaware of the unique endowments that lie dormant and undeveloped within.
- d) And you don't need any special equipment to do it.

Q34. DIRECTIONS for questions 33 and 34: The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.

Without the familiar light of day, the world after dark becomes an alien place. Darkness is anonymous, meaning that any response is valid; isolating, inviting, mysterious, magical, comforting, terrifying, unearthly. It is a time of dreams and nightmares, insomnia and fantasy, hauntings and enchantments. No wonder then that the nocturnal has continually fascinated artists.

- a) Art reveals a plethora of emotional responses, each a reaction to the transformative quality of night; from awe, anxiety and solitude, to love and loss, revelry, insomnia, and closure.
- b) Featuring the work of 60 artists, Towards Night draws on the 19th century European Romantic tradition and examines contemporary and historical feelings of wonderment and dystopia inspired by the midnight hour.
- c) Whilst divided by period, purpose, movement and medium, each of these pieces are linked by their fascination with the night-time world.
- d) Dedicated to displaying the themes of art comes a major exhibition hosted by Eastbourne-based Towner Art Gallery.

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

Manish was appointed the principal of a college in 2008. At the beginning of the year, he decided to assign unique ID numbers to all the students studying in the college. He also planned to assign ID numbers to all the

students who would join the college in subsequent years, such that no two students studying in the college at the same time will have the same ID number. The ID numbers that he assigns to the students are natural numbers and the ID number of any student remains the same for all the years that he is in the college. Each student who joins the college studies in the college for exactly four successive years – from the first year to the fourth year – before passing out of the college. Any student joins the college at the beginning of a calendar year and passes out of the college at the end of a calendar year. In 2008, there were exactly 46 students in the first year, 39 students in the second year, 84 students in the third year and 77 students in the fourth year. The students in the first year were assigned ID numbers from 1 to 46; the students in the second year were assigned ID numbers from 47 to 85; the students in the third year were assigned ID numbers from 86 to 169; the students in the fourth year were assigned ID numbers from 170 to 246. In each of the subsequent years, when the students in the fourth year pass out of the college, Manish plans to reuse the ID numbers of the students who would pass out by assigning them to the students who would join the college in that year. Only when the ID numbers of the outgoing students are not sufficient for the students who join the college, he plans to use higher numbers. While assigning these ID numbers, he always assigns any student the lowest possible natural number ensuring that no two students have the same ID number.

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

If the number of students who joined the college in 2009, 2010 and 2011 are 59, 61 and 64 respectively, the student with which of the following ID number will be in the second year in 2012?

- a) 45
- b) 145
- c) 210
- d) 230

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

If the number of students who joined the college in each of 2009, 2010 and 2011 is x and the ID number of one of the students in the first year in 2011 is 158, what is the minimum possible value of x ?

- a) 72
- b) 44
- c) 56

d) 42

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

If the ID number of a student in the third year in 2012 is 245, what is the minimum number of students who would have joined the college from 2009 till 2012?

- a) 160
- b) 155
- c) 154
- d) 165

Q4.

DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices. Two students, A and B, joined the college in 2010 and 2011 respectively. How many of the following pairs of ID numbers can be the ID numbers of A and B respectively?

- I. 158, 159
- II. 141, 140
- III. 154, 76
- IV. 189, 158

- a) 0
- b) 2
- c) 3
- d) 4

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

Kiran participated in a quiz show which comprised five rounds, namely, Quickfire, AV, Connect, Match and Wipeout, not necessarily in the same order. In each round, Kiran scored 10 or 15 or 30 or 50 points.

The following information is known about Kiran's score in each round:

1. The number of points Kiran scored in the second round is more than that in the fourth round.
2. Kiran's score at the end of the Wipeout round was 20 less than what he scored in Quickfire round.
3. Kiran's score immediately before the start of the Quickfire round was 60.
4. Kiran's score at the end of Connect round was 20 more than his score at the end of Match round.

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

How many points did Kiran score by the end of Match round?

- a) 20
- b) 30
- c) 40
- d) 60

Q6. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.

How many points did Kiran score in the third round?

- a) 10
- b) 15
- c) 30
- d) 50

Q7. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.

What is the total number of points scored by Kiran in the quiz?

- a) 90
- b) 70
- c) 85
- d) 135

Q8. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.

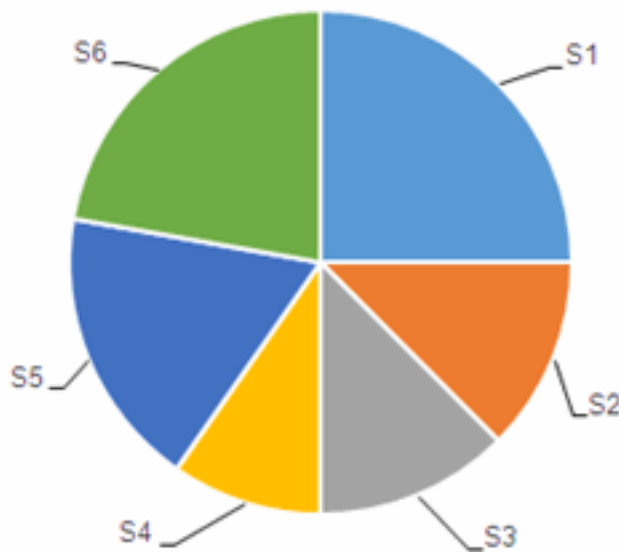
In which of the following rounds did Kiran score the maximum number of points?

- a) AV
- b) Match
- c) Connect
- d) Wipeout

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

Hari wrote six exams, each in a different subject among Maths, Physics, Chemistry, Economics, Botany and Zoology. The pie chart below, which is drawn to scale, provides the marks scored by Hari in each subject as a percentage of the total marks obtained by him in all the six subjects put together. The names of the subjects have intentionally been left out in the pie

chart and instead, the subjects are labelled as S1 to S6, in no particular order.



Further, it is also known that

1. in the pie chart, S1, S2 and S3 subtend angles of 90° , 45° and 45° respectively.
2. Hari scored 15 marks less in Chemistry than in Economics but he scored more in Chemistry as compared to Physics.
3. the angle that S4 subtends at the center is smaller than that subtended by S3.
4. the marks scored by Hari in Maths are the same as the sum of the marks scored by him in two other subjects, in each of which, Hari scored an equal number of marks.
5. the difference between the highest marks that Hari scored in any subject and the lowest marks that Hari scored in any subject is 55.
6. Hari scored 30 marks less in Zoology than in Chemistry.

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

What are the total marks scored by Hari across the six subjects?

- a) 400
- b) 360
- c) 450
- d) 270

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

How much did Hari score in Botany?

- a) 45
- b) 40
- c) 35
- d) 50

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

In given the pie chart, the sector representing which of the following subjects is definitely adjacent to the sector representing Zoology?

- a) Economics
- b) Maths
- c) Chemistry
- d) Physics

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

What is the angle subtended in the pie chart by the sector which represents the marks scored by Hari in Chemistry?

- a) 50°
- b) 55°
- c) 65°
- d) 70°

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

Jai, the watchman in an office, noted down the number of people that entered and exited the office building during each hour. Further, it is known that there was no one in the office before 9:00 AM and there was no one in the office after 5:00 PM. Also, any person entered the office exactly once and exited the office exactly once from 9:00 AM to 5:00 PM. The following table provides the number of persons entering and exiting the office during each hour:

Time	Number of Persons Entering	Number of Persons Exiting
9:00 AM to 10:00 AM	15	0
10:00 AM to 11:00 AM	26	10
11:00 AM to 12:00 noon	36	19
12:00 noon to 1:00 PM	41	54
1:00 PM to 2:00 PM	61	12
2:00 PM to 3:00 PM	29	23
3:00 PM to 4:00 PM	7	52
4:00 PM to 5:00 PM	6	51

Note: In the above table, the first row represents the number of people entering and exiting the office during the hour starting at 9.00 AM, i.e., including 9.00 AM, and ending just before 10.00 AM, i.e., excluding 10.00 AM.

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

What is the maximum possible number of persons that could have been in the office at 1:47 PM?

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

What is the maximum possible number of persons in the office at any time?

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

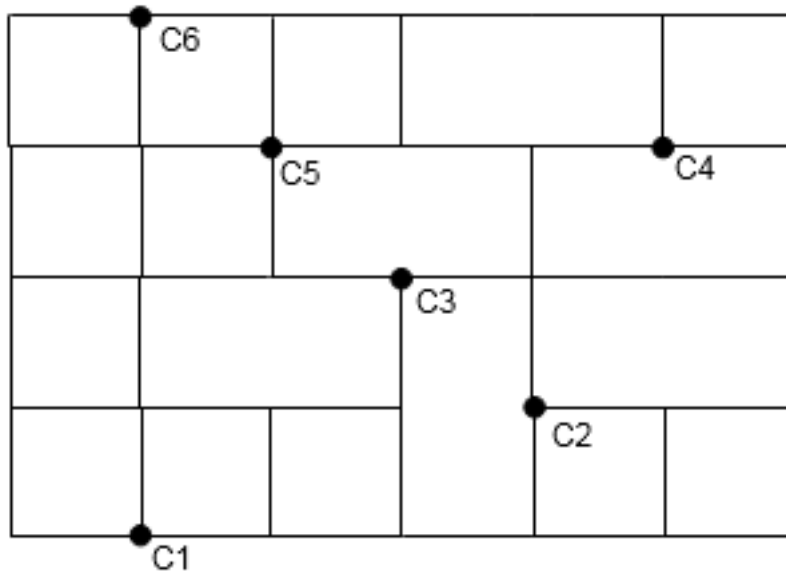
What is the maximum possible number of persons who could have entered the office at 1:00 PM and exited the office just before 5:00 PM?

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

What is the maximum possible number of persons who would have spent exactly 419 minutes in the office?

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

The following diagram shows the roads connecting six cities, indicated in the diagram as C1 through C6:



The six cities, denoted in the diagram as C1 through C6, are Violetwick, Whitesilver, Shadehollow, Moormeade, Southshore and Icefay, not necessarily in the same order. Any person travelling from one city to another does not pass through any other city. Further, while starting from a city, among the roads connected to that city, a person will travel only along the roads going North or South. However, while arriving at a city, he may arrive at the city along any of the roads connected to that city.

In the information provided below, the number and the order of the turns taken (left or right) by a person to travel between a few pairs of cities are given. Further, before and after taking any turn, a person always travels for some distance.

1. To reach Shadehollow from Moormeade, a person took two right turns, a left turn and another right turn, in that order.
2. To reach Violetwick from Whitesilver, a person took two right turns and a left turn, in that order.
3. To reach Southshore from Violetwick, a person took three left turns and two right turns, in that order.

Q17. DIRECTIONS for questions 17 to 19: Select the correct alternative from the given choices.

What is the city represented by C5?

- a) Moormeade
- b) Whitesilver
- c) Violetwick
- d) Southshore

Q18. DIRECTIONS for questions 17 to 19: Select the correct alternative from the given choices.

If a person starts from Shadehollow, took one left turn and reached another city, which of the following cannot be the city that he reached?

- a) Whitesilver
- b) Southshore
- c) Moormead
- d) More than one of the above

Q19. DIRECTIONS for questions 17 to 19: Select the correct alternative from the given choices.

If a person wanted to go from Moormead to Shadehollow, what is the minimum number of turns that he must take?

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

Q20. DIRECTIONS for question 20: Type in your answer in the input box provided below the question.

If a person started from Southshore and took exactly one turn, how many of the other five cities can he reach?

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

Six players – A through F – played in a badminton singles tournament, in which each player played exactly once against each of the other five players. In each match, the first person to score 21 points with a lead of at least two points (i.e., with the opponent scoring less than 20 points) wins the match. If a player scores 21 points without a lead of at least 2 points, the match continues until either of the two players obtains a lead of two points. The matches were played across five days, Day 1 to Day 5, with each player playing exactly one match on each day. The following table provides the points scored by each of the five players on each of the five days that he played:

Player	Day 1	Day 2	Day 3	Day 4	Day 5
A	16	21	18	19	21
B	24	21	21	17	15
C	21	21	21	21	23
D	22	17	23	21	22
E	21	16	16	19	21
F	14	16	21	21	24

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

D won a match against which of the following players?

- a) A
- b) B
- c) C
- d) F

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

Which of the following pairs of players played against each other on Day 4?

- a) B, C
- b) B, D
- c) E, F
- d) C, E

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

What is the total number of points scored by both the players in the match that F played on Day 3?

- a) 44
- b) 42
- c) 39
- d) 37

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

Who among the following won all the matches he played after he played against E?

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

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

Six persons – A through F – are standing in a line, from East to West, not necessarily in the same order. However, three of the six persons are facing North and the other three are facing South. Further, no two persons standing next to each other are facing the same direction.

It is also known that

1. B is two places to the left of C but neither of the two are at any extreme end.
2. one of the persons who is facing South has five persons to the left of him.
3. the number of persons to the left of A, who is facing North, is one more than the number of persons to the right of D.
4. E is to the left of D and two places to the left of F.

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

How many persons are standing to the right of D?

- a) **4**
- b) **3**
- c) **0**
- d) Cannot be determined

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

Who among the following is standing adjacent to E?

- a) **A**
- b) **B**
- c) **D**
- d) Cannot be determined

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

How many persons are standing to the right of A?

- a) **4**
- b) **3**

- c) 2
- d) 0

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

The number of persons standing to the left of E is the same as the number of persons standing

- a) to the left of C.
- b) to the right of B.
- c) to the left of A.
- d) to the right of F.

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

On a particular day, five persons – Pavan, Salman, Farhan, Lokesh and Manish – went to a multiplex to watch five movies each of a different duration among 100 minutes, 125 minutes, 160 minutes, 180 minutes and 205 minutes. The show of each of the five movies began at a different time among 11:00 AM, 11:25 AM, 11:45 AM, 11:50 AM and 12:15 PM. Further, each show ended exactly after the duration of that movie and the five persons came out of the multiplex immediately after the show ended. It is also known that

1. no two persons came out of the multiplex at the same time
2. Pavan, who watched 125-minute-long movie, did not come out of the multiplex before 1:20 PM.
3. among the five persons, the last person to come out of the multiplex was Farhan.
4. Lokesh came out of the multiplex after 2:45 PM but he did not watch the 205-minute-long movie.
5. among the five persons, at least three persons came out of the multiplex before Manish did.

Q29. DIRECTIONS for question 29: Select the correct alternative from the given choices.

Who watched the 160-minute-long movie?

- a) Lokesh
- b) Manish
- c) Farhan

d) Salman

Q30. DIRECTIONS for question 30: Type in your answer in the input box provided below the question.

How many persons started watching a movie before Manish did?

Q31. DIRECTIONS for question 31: Select the correct alternative from the given choices.

At what time did Lokesh come out of the multiplex?

- a) 2:50 PM
- b) 2:55 PM
- c) 3:10 PM
- d) 3:15 PM

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

What is the duration (in minutes) of the movie that began at 11:45 AM?

QA

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

If a , b and c are positive real numbers such that $(\log_{10} a)(\log_{10} b) + (\log_{10} ab)(\log_{10} c) = 425$ and $abc = 1065$, find the value of

$$\left[(\log_{10} a)^2 + (\log_{10} b)^2 + (\log_{10} c)^2 \right]^{\frac{1}{3}}.$$

- a) 24
- b) 15
- c) 25
- d) 30

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

Imran has the same number of brothers as he has sisters. If each sister of Imran has twice as many brothers as sisters, how many siblings does Imran have?

- a) 7
- b) **5**
- c) **6**
- d) **8**

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

Find the cost price (in Rs.) of an item, if by selling it for Rs.800 a trader realizes a profit of 25%.

- a) **600**
- b) 640
- c) **625**
- d) **720**

Q4. DIRECTIONS for questions 4 and 5: Type in your answer in the input box provided below the question.

Find the least positive integer such that, if the leftmost digit in the integer is removed, the resulting number is $\frac{1}{13}$ th of the original integer.

Q5. DIRECTIONS for questions 4 and 5: Type in your answer in the input box provided below the question.

If the sum of the first 2017 terms of a geometric progression is 400 and the sum of the first 4034 terms is 700, find the sum of the first 6051 terms of the geometric progression.

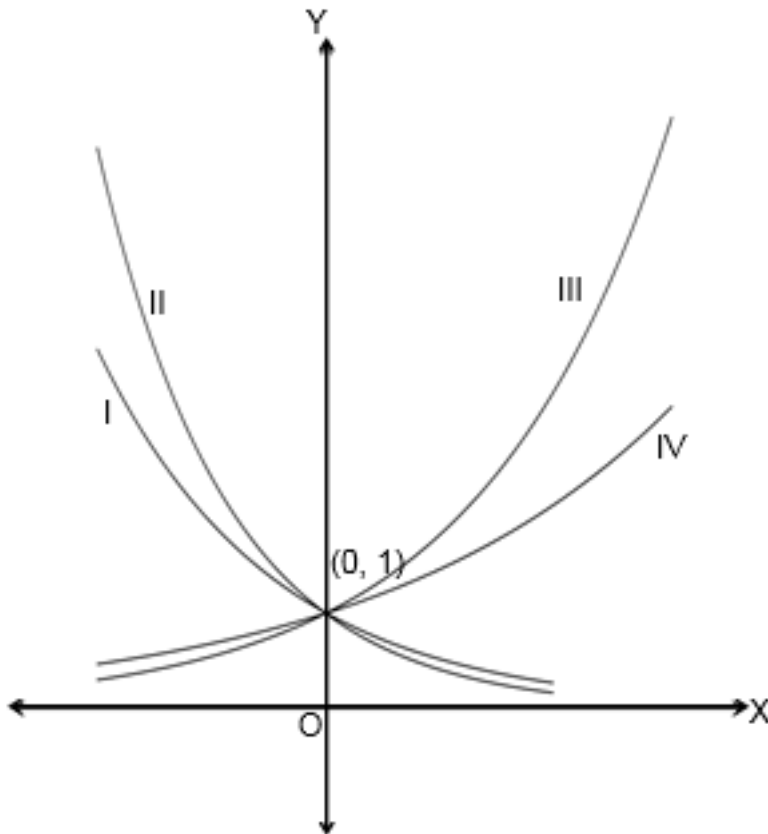
Q6. DIRECTIONS for questions 6 and 7: Select the correct alternative from the given choices.

If a coin is biased such that, when it is flipped six times, the probability of four heads and two tails turning up is four times the probability of two heads and four tails turning up, find the probability of an equal number of heads and tails turning up when the coin is flipped four times.

- a) $\frac{8}{27}$

- b) $\frac{6}{81}$
 c) $\frac{4}{81}$
 d) $\frac{3}{8}$

Q7. DIRECTIONS for questions 6 and 7: Select the correct alternative from the given choices.



The above figure represents the graphs of $0.3x$, $2x$, $0.2x$, and $3x$, identified as I, II, III and IV, not necessarily in the same order. Which of the following represents the correct correlation between, I, II, III and IV (in that order) and the graphs of the functions they represent?

- a) $2x$, $0.2x$, $0.3x$, $3x$
 b) $0.3x$, $0.2x$, $3x$, $2x$
 c) $0.2x$, $0.3x$, $3x$, $2x$
 d) $0.3x$, $0.2x$, $2x$, $3x$

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

Two students, P and Q, took an exam comprising exactly seven questions. Each question correctly answered fetches 2 marks and there is no penalty for incorrect answers. It is known that both P and Q attempted all the seven

questions. If the first question was answered correctly by P but incorrectly by Q, in how many ways can P get a total score that is more than that of Q?

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

A and B can build a certain wall in 20 days and 30 days respectively. In how many days can they together build two such walls?

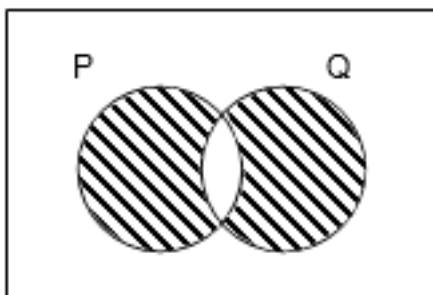
- a) 12
- b) **18**
- c) **20**
- d) **24**

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

Among 300 students in a coaching institute, 180 took the CAT exam, 150 took the XAT exam and at least 50 students took neither the CAT nor the XAT. If the number of students who took both the exams is at least N and at most M, find the value of $M + N$.

Q11. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

Consider the shaded region in the following figure:



How many of the following correctly represent the shaded region shown above?

- (i) $(P - Q) \cup (Q - P)$
- (ii) $(P' \cap Q) \cup (Q' \cap P)$
- (iii) $(P \cup Q) - (P \cap Q)$

- a) **3**
- b) 2
- c) **1**

d) 0

Q12. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

In triangle PQR, $PQ = 67$, $QR = 59$ and $PR = 62$. The angle bisectors of angle P and angle Q intersect sides QR and PR at S and T respectively. If X and Y are the feet of the perpendiculars from R to \overline{PS} and \overline{QT} respectively, find the measure of \overline{XY}

a) 27

b) $19\sqrt{2}$

c) 29

d) $15\sqrt{3}$

Q13. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

If the average weight of a class of 20 students decreased by 0.25 kg when a boy weighing 48 kg was replaced by another boy weighing A kg, find the value of A.

a) 43

b) 45

c) 53

d) 41

Q14. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

Eight men and three women can complete a certain work in eight days, which twelve men and a women take six days to complete. If a men and nine women take ten days to complete the same work, find a. (Assume that both men and women have a positive rate of work)

a) 5

b) 4

c) 3

d) 2

Q15. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

Find the percentage reduction in the area of a rectangle, if its length is increased by 25% and its breadth is decreased by 25%.

- a) $6\frac{1}{4}\%$
 b) $6\frac{1}{2}\%$
 c) $6\frac{3}{4}\%$
 d) $8\frac{1}{2}\%$

Q16. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

Find the value of $(x - y)$, if $|x + 2017| - |x - 2017| = 2$ and $|y - 2017| - |y + 2017| = 2$.

- a) 0
 b) 2
 c) 3
 d) Cannot be uniquely determined

Q17. DIRECTIONS for questions 11 to 17: Select the correct alternative from the given choices.

If the total simple interest earned on Rs.60,000, at a rate of interest of 7.5% per annum, for n years is Rs.36,000, find n .

- a) 6
 b) 10
 c) 9
 d) 8

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

If a and b are positive real numbers such that $a^3b^2 = 1458$, find the minimum value of $4a + 3b$.

Q19. DIRECTIONS for questions 19 to 21: Select the correct alternative from the given choices.

If $x \oplus y = \frac{x+y}{x-y}$, find the value of t such that $7 \oplus (t \oplus 2) = 2$.

- a) 4

- b) $4\frac{1}{2}$
 c) 5
 d) 6

Q20. DIRECTIONS for questions 19 to 21: Select the correct alternative from the given choices.

The number of positive integral solutions to the equation $4x + 5y + 2z = 111$ is

- a) 112.
 b) 128.
 c) 134.
 d) 146.

Q21. DIRECTIONS for questions 19 to 21: Select the correct alternative from the given choices.

$$\sqrt[3]{x} = \frac{6}{5 - \sqrt[3]{x}}$$

Find the sum of all possible values of x for which

- a) 35
 b) 24
 c) 20
 d) 8

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

Find the smallest positive integral value of t for which the polynomial expression $x^4 - tx + 48$ can be expressed as a product of two quadratic expressions with integer coefficients.

Q23. DIRECTIONS for questions 23 to 26: Select the correct alternative from the given choices.

If a square of area 392 sq. cm is inscribed in a circle of radius r , such that all the vertices of the square lie on the circumference of the circle, which of the following gives the measure of r (in cm)?

- a) 14
 b) 12
 c) $7\sqrt{2}$
 d) 21

Q24. DIRECTIONS for questions 23 to 26: Select the correct alternative from the given choices.

Two WBSTC buses, one going from Asansol to Kolkata, starting at 8 am, and the other going from Kolkata to Asansol, starting at 8:55 am, share the same route and cross each other at 11 am. If both the buses reach their respective destinations simultaneously, at what time do they reach their destinations? (Assume that the two buses travel without stopping from their origin city to their destination city)

- a) 12:45 pm
- b) 1:00 pm
- c) 1:30 pm
- d) 1:45 pm

Q25. DIRECTIONS for questions 23 to 26: Select the correct alternative from the given choices.

Consider the following definition of $f(x)$:

$f(x) = f(f(x+4))$, if $x < 100$ and

$f(x) = x - 2$, if $x \geq 100$.

Find the value of $f(50)$.

- a) 95
- b) 96
- c) 97
- d) 98

Q26. DIRECTIONS for questions 23 to 26: Select the correct alternative from the given choices.

The ratio of the lengths of the bases of two non-congruent isosceles triangles, each of integral sides, is 2 : 3. If the two triangles have the same perimeter and the same area, find the minimum possible value of the perimeter of each triangle.

- a) 51
- b) 68
- c) 76
- d) 102

Q27. DIRECTIONS for questions 27 to 31: Type in your answer in the input box provided below the question.

If $f_1, f_2, f_3, \dots, f_n$, is the list of all the factors of 10100 (i.e., the number of factors of 10100 is n), find the sum $\log_{10}(f_1) + \log_{10}(f_2) + \log_{10}(f_3) + \dots + \log_{10}(f_n)$.

Q28. DIRECTIONS for questions 27 to 31: Type in your answer in the input box provided below the question.

If x is an integer such that $40 < x < 100$ and $\cos 37x + \cos 35x = 8\cos 36x \cos 3x$, where x is measured in degrees, find the sum of all the possible values of x (in degrees).

Q29. DIRECTIONS for questions 27 to 31: Type in your answer in the input box provided below the question.

Three boys A, B and C, had a total of N mangoes with them, which they

divided between themselves in the following manner. First, A took $\frac{1}{4}^{th}$ of the total number of mangoes, then B took $\frac{1}{3}^{rd}$ of the remaining number of mangoes. Next, C took half the remaining number of mangoes. If the mangoes finally remaining were divided between A, B and C in the ratio 3 : 2 : 1, and no mango was cut in the entire process, find the minimum possible value of N .

Q30. DIRECTIONS for questions 27 to 31: Type in your answer in the input box provided below the question.

If ABCD is a square of side 24 cm and an isosceles triangle PCD is drawn, with $PC = PD$, such that the area common to the square ABCD and the triangle PCD is 360 sq.cm, find the area (in sq.cm) of the triangle PCD.

Q31. DIRECTIONS for questions 27 to 31: Type in your answer in the input box provided below the question.

There are n distinct balls in a bag. If the number of ways of selecting five balls from the bag is twice the number of ways of choosing two balls from the bag, find the value of n .

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

Manik wanted to draw the graph of the equation $3x + 7y = 42$ on a graph paper, with each square on the graph paper having a side of length one unit. How many of the unit squares in the graph paper will have their interiors lying entirely in the first quadrant and entirely below the graph of the given equation?

- a) 33
- b) 31
- c) 37
- d) 35

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

The difference between the total simple interest (SI) and the total compound interest (CI) earned on a certain sum of money, P, for two years is Rs. 364. If

the rates at which CI and SI are calculated are $8\frac{1}{3}\%$ per annum,

compounded annually, and $11\frac{1}{9}\%$ per annum respectively, find the value of P.

- a) Rs.6400
- b) Rs.7200
- c) Rs.7248
- d) Rs.7488

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

In the first year of a B-school, 68% of the students are boys and 75% of the students are engineers. After these students are joined by another 25 girls, all of whom are engineers, 64% of the students are boys. Find the total number of engineers in the first year of the B-school after the girls joined.

- a) 300
- b) 325
- c) 375
- d) 400