Mock CAT – II

INSTRUCTIONS

Before the Test:

1.   DO NOT OPEN THIS BOOKLET UNTIL THE SIGNAL **TO START** IS GIVEN.
2.   Keep only the Admit Card, pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rules, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place as indicated by the invigilator.
3.   Use only an HB pencil to fill in the Answer Sheet.
4.   Enter in your Answer Sheet: (a) in Box 10 the Test Form Number, which appears at the bottom of this page, (b) in Box 11 the Test Booklet Serial number, which appears at the top of this page.
5.   Ensure that your personal data have been entered correctly on Side 1 of the Answer Sheet.
6.   Check whether you have entered your 7-digit Enrollment ID in Box 2 of the Answer sheet correctly.

At the Start of the Test:

1.   As soon as the signal to start is given, open the Booklet.
2.   This Test booklet contains 24 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. Also that the Test form Number indicated on the cover page and at the bottom of the inner pages is the same. If there is a problem with your Test Booklet, immediately inform the invigilator/supervisor. You will be provided with a replacement.

How to answer:

1.   This test has **three** sections which examine various abilities. These 3 sections have **81 questions** in all with each section having **27 questions**. You will be given **two and half hours** to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.
2.   Directions for answering the questions are given before some of the questions wherever necessary. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. There is only one correct answer to each question.
3.   **Each section carries 60 marks**. Each section is divided into three sub-sections, A, B and C. All Questions in Sub-sections I-A, II-A and III-A carry one mark each. All Questions in Sub-sections I-B, II-B and III-B carry two marks each. All Questions in sub sections I-C, II-C and III-C carry three marks each. Wrong answers will attract a penalty of one-fourth of the marks allotted to the questions.
4.   Do your rough work only on the Test Booklet and NOT on the Answer Sheet.
5.   Follow the instructions of the invigilator. Candidates found violating the instructions will be disqualified.

After the Test:

1.   At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces. "You may leave now." The invigilator will make the announcement only after collecting the Answer Sheets from all the candidates in the room.
2.   You may retain this Test Booklet with you.

Candidates giving assistance or seeking/receiving help from any source in answering questions or copying in any manner in the test will have their Answer Sheets cancelled.

MCT-0011/07

SECTION – I

Sub-section I-A : Number of questions = 8

Note: Questions 1 to 8 carry one mark each.

DIRECTIONS for Questions 1 to 5: Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

1. The solitary condition of watching movies hasn't changed—if anything, DVD probably means that we are more often literally on our own when we watch films—but the movie world has lost some of its love for loners. Even CGI fantasies like the Toy Story films and the Lord of the Rings cycle are about teamwork. So if it is going too far to say that movies are more liberal than they were, they are at any rate less socially empty. Reality, it seems, no longer "pops you out of the story," as they say in Hollywood. We don't mind seeing it now and again on the big screen, especially if our daily lives don't always feel that real._____

   1. One of the biggies was Traffic, a film about duplicity in the US war on drugs that won four Oscars for Steven Gaghan as screenwriter.
   2. Erin Brockovich was about a single mother who takes on and beats a corporation, for which Julia Roberts won her Oscar.
   3. The political strain in cinema was there then—it always has been, the question is whether it will only ever be a strain.
   4. But to put this in perspective, it is worth looking back to the 2001 Oscars to see what was nominated in the year before 9/11.
   5. The MP4 format is becoming more popular.

2. Nobody likes to feel fearful and because of that, most people will habitually react to fear by avoiding, repressing or suppressing it. It takes courage and wisdom to see that our fear can be our greatest teacher. When we examine our fear, we will often discover that it is irrational. There is no real basis or substance to our fear. _____

   1. Fear is very much real and is built upon past experiences or imprints.
   2. That is why fear is often described as "False Evidence Appearing Real".
   3. The situation may have changed but the imprints compel us to react in a knee jerk manner.
   4. The good news is that this habit or tendency CAN be transformed.
   5. Fear helps us achieve great things in life.

3. One event defined the global automotive industry in 1913 - Henry Ford's moving assembly line. It paved the way for mass production and consumption of cars; it led to the birth of the world's first blockbuster car - the legendary model T; it spawned dozens of gigantic automotive companies whose revenues rivalled the GDPs of many nations; it made car manufacturing one of the most exalted forms of industrial activity. Ninety years later, the automotive industry is perhaps in the middle of the second such defining moment - 'the moving design line'. True, the moving design line was conceived more than a decade ago. _____

   1. They have demonstrated a strong tendency to pass on R&D, design, engineering and prototyping responsibility to vendors.
   2. They have also preferred to outsource what little design responsibility was left with them.
   3. But now, the break up of the automotive engineering design process and the dispersed development of the building blocks are a way of life for carmakers.
   4. Therefore, the phrase 'a defining trend' may not be more apt than 'a defining moment'.
   5. Outsourcing does create a burden on the car maker.

4. One theme central to Confucianism is that of relationships, and the differing duties arising from the different status one held in relation to others. Individuals are held to simultaneous stand in different degrees of relationship with different people, namely, as a junior in relation to their parents and elders, and as a senior in relation to their children, younger siblings, students, and others. While juniors are considered in Confucianism to owe strong duties of reverence and service to their seniors, seniors also have duties of benevolence and concern toward juniors. _____

   1. Loyal is the equivalent of filial piety on a different plane, between ruler and minister.
   2. Loyalty was particularly relevant for the social class to which most of Confucius' students belonged.
   3. Like filial piety, however, loyalty was often subverted by the autocratic regimes of China.
   4. The theme of extensive filial duties consistently manifests itself in many aspects of East Asian culture even to this day.
   5. Self-Reliance is not given so much emphasis in other cultures.

5. Basically, birds' wings are not flat but are shaped like an aerofoil - concave. Air passes over or under the wing as the bird moves forward, or as the wind blows. The air that moves over the top of the wing has further to travel to get across the wing, thus it speeds up. This causes the pressure to drop because the same amount of air is exerting its pressure over a greater area. Therefore, any given point experiences less pressure. This effectively sucks the wing up. Meanwhile the air going below the wing experiences the opposite effect. _____

   1. Hence a bird with air moving over its wings is pulled up from above and pushed up from below.
   2. The more curved the aerofoil the greater the lift providing the degree of curve does not impede the flow of air.
   3. It slows down, generates more pressure and effectively pushes the wing up.
   4. This is the resistance the air gives to anything passing through it.
   5. Birds are the inspiration behind the modern plane.

DIRECTIONS for Questions 6 to 8: Each question has a set of four sequentially ordered statements. Each statement can be classified as one of the following:
- Facts, which deal with pieces of information that one has heard, seen or read, and which are open to discovery or verification (the answer option indicates such a statement with an 'F').
- Inferences, which are conclusions drawn about the unknown, on the basis of the known (the answer option indicates such a statement with an 'I').
- Judgements, which are opinions that imply approval or disapproval of persons, objects, situations and occurrences in the past, the present or the future (the answer option indicates such a statement with a 'J')

Select the answer option that best describes the set of four statements.

6. 1. Restricting glucose first spurred the worms to generate more free radicals, but then they quickly built up long-lasting defences against them, said Michael Ristow, an endocrinologist at the University of Jena and the German Institute of Human Nutrition, who led the study.
    2. The couple had married under the Special Marriage Act and on August 30, probably fearing harassment by the Todis, sought police protection in writing.
    3. The assumption of the police and parents is that an adult woman is incapable of choosing her own partner — even though she can vote and decide the future of the country — and must therefore be coaxed, coerced or emotionally blackmailed to do her father's bidding.
    4. Negative emotions like lust, pride, attachment, anger, ego, greed and jealousy are distortions of love.
    1. IIIJ   2. FFIJ   3. FIJJ   4. JIJJ   5. FIJF

7. 1. Our life is a struggle involving pretensions of what we are not and in the process we do not feel good.
    2. Politics is unlike any other career, in the sense that it needs more passion and commitment and care for people.
    3. The reduction in the interest rates of loans for new borrowers is likely to create an incentive for the buyer who is thinking of a new house.
    4. We cannot thank our teachers enough for what they have given us.
    1. FFJI   2. FIJI   3. JJIJ   4. FIJJ   5. IIIJ

8. 1. A recent trend in capital punishment has been the reduction in the number of offences statutorily punishable by the death penalty.
    2. The traffic control drive, which began in this week, is expected to inspire drivers to obey traffic rules.
    3. The government has decided to maintain the United Kingdom's independent nuclear deterrent.
    4. In 1993, the Booker Prize was awarded to Salman Rushdie for Midnight's children.
    1. FIIJ   2. JIIF   3. FIFF   4. JFIJ   5. IJIF

Note: Questions 9 to 13 carry two marks each.

DIRECTIONS for Questions 9 and 10: The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences among the given choices to construct a coherent paragraph.

9. A. If something in the schedule has to slip, if something isn't going to get done, make sure it's not part of the 20 percent.
    B. Of the things you do during your day, only 20 percent really matters.
    C. The value of the Pareto principle for a manager is that it reminds you to focus on the 20 percent that matters.
    D. Identify and focus on those things.
    E. It can multiply the profitability of corporations and the effectiveness of any organization or individual.
    F. When the fire drills of the day begin to sap your time, remind yourself of the 20 percent you need to focus on.
    G. The 80 – 20 principle can and should be used by every intelligent person in their daily life.
    1. CBDAFGE   2. CDBAFGE   3. GECBDFA   4. GCEBDFA   5. BDFAGEF

10. A. Driven by the desire to control workers, bosses attack trade unionism using a system called Human Resource Management.
    B. Thus managers control the workforce – if workers are prevented from organizing and bargaining collectively, the bosses' job is made even easier.
    C. In this way, workers are forced to compete with each other at home and abroad.
    D. Instead the problems they cause are reflected in lower labour standards as we are forced to compete with each other, affecting professional and skilled as well as unskilled workers.
    E. Free trade, globalisation and unfettered capitalism have proved incapable of providing often repeated promises of prosperity.
    F. Human Resource Management works on a global level – stories abound of workers intimidated into accepting poor wages and conditions by bosses threatening to move production abroad.
    G. This system exploits every opportunity to isolate workers and force us into competition.
    1. AFEDCGB   2. EDAGFCB   3. AFGEDCB   4. EDAFCGB   5. AGFCBED

DIRECTIONS for Questions 11 to 13: In the following questions a passage is given with four statements following it. Read the passage and on the basis of the information available decide if :

a)   If the argument is an <u>upstream argument</u>
b)   If the argument is a <u>downstream argument</u>
c)   If the argument is a <u>lateral argument</u>
d)   If the argument is <u>irrelevant to the passage</u>.

Then from the answer choices choose the option where the statements have been labelled correctly.

Example of upstream, downstream and lateral arguments.

Passage: *Ram gave great attention to all minute details and carefully chose his ensemble while getting ready for Mira's birthday party.*

Upstream Argument: If the passage is a direct conclusion or inference that can be drawn from the statement, the statement is an upstream argument

E.g. *Ram took a lot of time to get ready for the party.*
One gets to know why Ram took a lot of time to get ready from the passage. Therefore in case of an upstream argument the passage logically follows the question statement

Downstream Argument: If the statement is a direct conclusion or inference that can be drawn from the passage then the argument is a downstream argument.

E.g. *Ram was complimented for his attire at the party.*
This would clearly be a downstream argument. Here, the statement happens to logically follow the passage. As we know that Ram gave great attention to his attire for the party, he looked good and was therefore complimented on the same.

Lateral Argument: If the statement supports the passage but is neither upstream nor downstream, then it is a lateral argument

E.g. *Ram believes in sartorial elegance*

Here the statement adds to the passage and supports it. However, it is neither an inference nor a conclusion. Such an argument is called a Lateral Argument. Also, a lateral argument is not related to the central idea of the passage but is not completely irrelevant to the topic of discussion. In the given statement we can say that Ram likes to dress well and look good. This is evident from the given passage but this nowhere relates to the fact that he was very careful while dressing up for Mira's birthday party. So it is not related to the central theme i.e. Ram's attire for Mira's party but is related to the topic i.e. Ram's eagerness to dress well.

11. The more worried investors are about losing their money, the more they will demand a high potential return on their investment; great risks must be offset by the chance of great rewards.
    (i)   Mr. Nair is nearing retirement and therefore, unlike in the past, these days he is allocating his savings more into fixed interest debt instruments than into the volatile stock market.
    (ii) The relation between the risk profile of an investment and expected returns from it are directly proportional to each other.
    (iii) Many stock market crises are created by speculators looking for high quick returns rather than regular investors with a more long-term view of their investments.
    (iv) A recent public issue by a company to raise money for a new venture failed because potential investors felt that the projected returns were too low.
    1. a, b, c, d   2. c, b, d, a   3. a, c, d, b   4. c, d, a, b   5. b, d, a, c

12. The response of present nuclear-missile defence systems controlled by complex computer programmes to unexpected circumstances is unpredictable.
    (i)   It is uncertain what the response of such a system to the explosion of a large meteorite in the earth's atmosphere with approximately the force of a 12-megaton nuclear blast would be.
    (ii) Scientists are busy developing the next generation of nuclear missile defence systems designed to respond to any relevant contingency in a predictable and programmed manner.
    (iii) Even after the end of the Cold War the threat of nuclear missile attacks is perceived as a real threat by most developed countries which continue to make huge expenditures in upgrading their missile defence systems.
    (iv) Even after the end of the Cold War the arms race has continued to escalate in different parts of the globe.
    1. a, d, b, c   2. a, b, c, d   3. b, a, c, d   4. d, a, b, c   5. c, d, a, b

13. Many countries located far from the equator have laws requiring the use of headlights by cars during daylight hours.
    (i)   Chances of automobile collision are more in daylight driving under poor visibility than in night driving.
    (ii) Poor daylight visibility, which is a problem for many countries located far from the equator, is often responsible for automobile collisions.
    (iii) Automobile collisions are often avoided by the enactment of appropriate laws by the authorities.
    (iv) Fewer automobile collisions probably occur each year in countries located far from the equator that have daytime headlight laws than in similar countries that do not have such laws.
    1. a, d, b, c   2. c, d, b, a   3. b, c, a, d   4. d, a, c, b   5. d, b, a, c

Note: Questions 14 to 27 carry three marks each.

DIRECTIONS for Questions 14 to 27: Each of the three passages given below is followed by a set of questions. Choose the best answer to each question.

PASSAGE - I

A short History of Rudeness is a thoughtful and witty book, an examination of manners, American-style. It draws on an impressive variety of sources. Obviously, as Mark Mathew says, manners, are a subject "every-one cares about," but it is difficult to recall a single book in which they are discussed as comprehensively and intelligently as in this one.

As Mathew understands, manners are at once simple and complex, and his attempt to characterize them takes this into account: "Manners, good and bad, pervade so much of daily life that at times they seem to embrace everything – considerateness and selfishness, freedom and anarchy, birth and death, cooking and upholstery, crime and punishment, linens and sex. Manners are trivial, profound and amorphous beyond compassing. Manners are what is left when serious issues of human relations are removed from consideration, yet without manners serious human relations are impossible."

Dip your toe into the murky waters of manners, and soon enough you'll find yourself dragged in right down, or up, to your hat. If manners were only about when (not to mention how!) to use fish knives or whether to walk on the street side of your female companion, perhaps they would be simple and subject to comfortable "rigidities and fiats." But manners are also about morals, and ethics, and mobility both physical and social, and class, and the workplace, and a great many other subjects that introduce ambiguity and uncertainty, rather than clarity, into the equation.

Mathew begins his journey through the mysteries of manners with a brief recollection of two New Yorkers who thrived early in the century. One, Colonel William Mann, published a scandalous weekly, Town Topics, that excoriated the high and mighty in a "personal, vicious, salacious" style; the other was Emily Post, whose famous book, Etiquette (1992), "addressed frankly a widening conviction among Americans that good conduct and morality were becoming unglued from each other." The two regarded each other with hostility, but:

'Mann and Post, had they ever met, could nonetheless have seen eye to eye on one key point. Both took manners seriously; neither thought them a trivial study; both saw them as indissolubly linked to the gravest issues of morality. Blackmailer and extortionist he may have been, but a genuine moral indignation fuelled Mann's attack on the hypocrisy of the gilded class he'd stealthily invaded. He despised the perverse misuse of social polish as a cover for vice. Manners, he thought, ought to reflect morals and reinforce them, not cover up for their absence. And Post, though she belonged to that class by unassailable birthright, agreed emphatically as to the moral importance of manners and the extent to which her compatriots often casually betrayed them. "The code of ethics.' Emily Post wrote, 'is an immutable law of etiquette." True good manners were therefore the reverse of vacuous rituals. 'The code of a thoroughbred.' she continued, '...is the code of instinctive decency, ethical integrity, self-respect and loyalty."

At present, the connection between manners and morals is a central theme of the political and/or social conservatives – Hummelfarb, John Silber, William Bennett – who have been the most forceful and prominent advocates of what might be called the moral life. Mathew, though he had – and what a relief it is! – no ideological axes to grind, seems to be rather to the left of the aforementioned, but this does not prevent him from examining their arguments sympathetically and dispassionately. "Manners are related to morals," he writes; "thus far the conservatives, from (Edmund) Burke to Himmelfarb and Silber, are right. But the link is far more deceptive, sinuous, and complicated than is usually admitted by those who yearn to restore some hypothetical lost bond between civility and ethics." What is moral to one person or group may be immoral to another person or group, and all parties to the disagreement may have legitimate, percussive reasons for what they believe, which is to say that what is mannerly to some will be unmannerly to others, and in many instances there simply is no way to reconcile their differences.

Not merely that, but there is "the close and troublesome linkage between manners and class." Manners "have immemorially served both as a badge of entry into an elite class and a barrier against encroachments by the déclassé," but "in America, values if not realities are egalitarian, and the persistence of sharp class distinctions is therefore a source of discomfort," to wit: "if manners are moral, and a rigid class system is immoral, then how can good manners not only coexist with but depend upon class?"

Complicating the issue still further is the relationship of manners to that most central of all American locations, the workplace.

Which leaves us to ponder the state of manners today, as we lurch into the next millennium in what seems – or so most critics and commentators, yours truly included, would have us believe – a most unmannerly fashion. There's all that rudeness and crudeness on the Internet, in pop music, in late-night cable television and daytime talk shows, in politics and sports and God knows what else. Is the end of manners really at hand?

Mathew, rather surprisingly, thinks not. The human instinct for civil behaviour, he believes, is powerful "First," he says, "civility is more adaptable and inventive than we give it credit for; it can take root even in the most unpromising soil. And second, as soon as we adjust ourselves to new manners, and begin to think them natural or even inevitable, they crumble in our grip, as if change and instability were part of their very existence…." What is perhaps most surprising, of all is that he finds hope in the person of Maratha Stewart, looking past her rank commercialism and self-promotion and finding an agenda that "seems not to imitate upper-class manners, but rather to separate the art of civilized living from class; to relocate it … to a schooling in good taste that anybody might acquire with thought and careful study."

14. In citing the specific things that manners at times seem to embrace, Mathew's aim is to
    1. be exhaustive with his illustrations and instances.
    2. suggest the range of things influenced by manners.
    3. establish the diminishing presence of manners in our daily lives.
    4. hold out manners as the deciding factor in all spheres of human life.
    5. none of the above.

15. Which of the following is the best paraphrasing of the last sentence of the second paragraph?
    1. Manners exist without serious human relations, but not vice-versa.
    2. Serious human relations exist without manners, but not vice-versa.
    3. Serious human relations can exist without manners, but not vice-versa.
    4. Manners and serious human relations go hand in hand.
    5. Manners cannot exist in the absence of serious human relations.

16. The reason that manners are not subject to 'comfortable rigidities and fiats' is that
    1. etiquette cannot be grammaticized.
    2. eating habits, and companionship, are very complex things..
    3. etiquette can be grammaticized, but not morality.
    4. manners are linked to ethics, the latter being averse to convenient compartmentalization.
    5. they encompass many spheres of our daily life.

17. Which of the following pair of terms have been interchangeably used in the course of the passage?
    1. "good conduct" and "morality".
    2. "social polish" and "vice".
    3. "high & mighty" and "gilded class".
    4. "social polish" and "gilded class".
    5. "ethics" and "gilded class".

18. In the passage, Mathew's main point/purpose is to remind us of
    1. the ineluctable linkage between manners and ethics.
    2. the subjective nature of morality itself.
    3. the crudeness attending on the day-to-day life of modern Americans.
    4. the great importance of his opus in any effort to chart the history of crudeness.
    5. the immorality of class differentiations.

PASSAGE - II

The start of a distinct modern molecular biology dates from the discovery of the structure of DNA by Watson and Crick.

In his book, **The Double Helix**, Jim Watson writes: "Back" in my rooms I lit the coal fire, knowing there was no chance that the sight of my breath would disappear before I was ready for bed. With my fingers too cold to write legibly I huddled next to the fireplace, daydreaming about how several DNA chains could fold together in a pretty and hopefully scientific way. Soon, however, I abandoned thinking at the molecular level and turned to the much easier job of reading biochemical papers on the interrelations of DNA, RNA and protein synthesis.

Virtually all the evidence then available made me believe that DNA was the template upon which RNA chains were made. In turn, RNA chains were the likely candidates for the templates for protein synthesis. There was some fuzzy data using sea urchins, interpreted as a transformation of DNA into RNA, but I preferred to trust other experiments showing that DNA molecules, once synthesized, are very very stable. The idea of the genes' being immortal smelled right, and so on the wall above my desk I taped up a paper sheet saying DNA -> RNA -> protein. The arrows did not signify chemical transformations, but instead expressed the transfer of genetic information from the sequences of nucleotides in DNA molecules to the sequences of amino acids in proteins"

The term Central Dogma is ascribed to Frances Crick. In his book, **What Mad Pursuit**, he describes why he used this term: "The other theoretical idea I proposed was of a rather different character. I suggested that "once 'information' has passed into protein *it cannot get out again,*" adding that "Information means here the precise determination of sequence, either of bases in the nucleic acid or of amino acid residues in the protein. I called this idea the central dogma, for two reasons, I suspect. I had already used the obvious word hypothesis in the sequence hypothesis, and in addition I wanted to suggest that this new assumption was more central and more powerful. I did remark that their speculative nature was emphasized by their names."

Nearly 20 years ago, biochemists found that a separable constituent of the cell Deoxyribonucleic acid or DNA appeared to guide the cell's protein synthesizing machinery. The internal structure of DNA seemed to represent a set of coded instructions which dictated the pattern of protein synthesis. Experiments indicated that in the presence of appropriate enzymes each DNA molecule could form a replica, a new DNA molecule containing the specific guiding message present in the original. This idea when added to what was already known about the cellular mechanisms of heredity appeared to establish a molecular basis for inheritance.

Proponents of the theory that DNA was a self duplicating molecule, containing a code that by itself determined biological inheritance, introduced the term 'central dogma' into scientific literature in order to describe the principles that were supposed to explain that the reverse effect is impossible, proteins cannot guide the synthesis of nucleic acids. But actual experimental observations deny the second and crucial part of this assumption. Other test-tube experiments show that agents besides DNA have a guiding influence. The kind of protein made may depend on the specific organism from which the necessary enzyme is obtained. It also depends on the test tube's temperature, the degree of acids and the amount of metallic salts present.

The central dogma banishes from consideration the interactions among the numerous molecular processes that have been discovered in cells or in their extracted fluids. In the living cell, molecular processes – the synthesis of nucleic acids and proteins or the oxidation of food substances – are not separate but interact in exceedingly complex ways.

No matter how many ingredients the biochemists test tubes may contain the mixtures are nonliving; but these same ingredients organized by the subtle structure of the cell constitute a system which is alive.

19. The experimental results mentioned in the passage suggest that biological inheritance depends on
     1. instructions contained in a single molecule within the cell.
     2. processes that are guided by specific enzymes.
     3. genetic information contained in metallic salts.
     4. interactions among several molecular processes in the cell.
     5. replicative processes within the chemistry of protein synthesis.

20. The author suggests that the most important difference observed between a dead cell and a living cell results primarily from the
     1. differences in the chemical elements present in each.
     2. differences in the degree of acidity present in each.
     3. biochemical procedures used to examine each cell.
     4. varying temperatures at which cells are examined.
     5. integrating mechanism thought to exist within the structure of the living cell.

21. The author presents his argument primarily by
     1. contrasting two fields of science.
     2. providing experimental evidence against a point of view.
     3. criticizing proponents of other theories.
     4. drawing an analogy with a related field of science.
     5. comparing two theories of cellular structure.

22. The author is primarily concerned with
     1. proposing that a new philosophical foundation for modern biochemistry be developed.
     2. describing the various processes that take place in a living cell.
     3. drawing analogies between different scientific fields.
     4. revealing a discrepancy between a scientific theory and some experimental results.
     5. questioning the assumptions behind experimental results in science.

23. The author refers to the results of test tube experiments involving the replication of DNA primarily to
   1. question the validity of experimental results that describe the structure of DNA.
   2. provide evidence to contradict the theory that DNA alone governs protein synthesis.
   3. show the way in which DNA acts as a self- duplicating molecule.
   4. explain the internal structure of DNA.
   5. reveal how nucleic acid can influence the synthesis of proteins.

PASSAGE - III

Karl Marx (1818-1883) is best known not as a philosopher but as a revolutionary communist, whose works inspired the foundation of many communist regimes in the twentieth century. It is hard to think of many who have had as much influence in the creation of the modern world. Trained as a philosopher, Marx turned away from philosophy in his mid-twenties, towards economics and politics. However, in addition to his overtly philosophical early work, his later writings have many points of contact with contemporary philosophical debates, especially in the philosophy of history and the social sciences, and in moral and political philosophy. Historical materialism — Marx's theory of history — is centered around the idea that forms of society rise and fall as they further and then impede the development of human productive power. Marx sees the historical process as proceeding through a necessary series of modes of production, culminating in communism. Marx's economic analysis of capitalism is based on his version of the labour theory of value, and includes the analysis of capitalist profit as the extraction of surplus value from the exploited proletariat. The analysis of history and economics come together in Marx's prediction of the inevitable breakdown of capitalism for economic reasons, to be replaced by communism. However Marx refused to speculate in detail about the nature of communism, arguing that it would arise through historical processes, and was not the realisation of a pre-determined moral ideal

In works like the German Ideology and The Communist manifesto written with Frederick Engels, Marx proposes a model of history in which economic and political conditions determine social conditions. Using Hegel's theory of dialectic, which suggests that history progresses throughout the resolution of contradictions within a particular aspect of reality, Marx and Engels posit a materialistic account of history that focuses upon the struggles and tensions within society. As society forms more complex modes of production, it becomes increasingly stratified; and the resulting tensions necessitate changes in society. For example, the introduction of heavy machinery into the feudal economic system fragmented existing social structures and necessitated a move towards capitalism.

Within Marx's dialectical account of history is the idea that a given individual's social being is determined by larger political and economic forces. Marx writes that it is not the consciousness of men that determines their being, but on the contrary, it is their social being that determines consciousness. Marx then expands this concept of determination into one of the central concepts of Marxism – that of base and superstructure. The base is the economic system on which the superstructure rests, cultural activities such as philosophy or literature belong to the superstructure. To Marxist's critics, a society's economic base determines the interests and styles of its literature; it is this relationship between determining base and superstructure that is the main point of interest for Marxist critics.

Marx believes that because the superstructure is determined by the base, it inevitably supports the ideologies of the base. Ideologies are the changing ideas, values and feelings through which individuals experience their societies. They present the dominant ideas and values as the beliefs of society as a whole, thus preventing individuals from seeing how society actually functions. Literature as a cultural production, is a form of ideology, one that legitimises the power of the ruling class. In the 18th century, for example, literature was used by the English upper classes both to express and transmit the dominant value systems to the lower classes.

The Italian theorist Antonio Gramsci, with his concept of hegemony, allows for an even more flexible reading of the base model. Gramsci believes that ideology alone cannot explain the extent to which people are willing to accept dominant values. He also realizes along with many other Marxist critics that the base model is much too rigid to account for cultural productions which do not simply reinforce those dominant values. His notion of hegemony is a continuation of the concepts behind ideology. Hegemony is a sort of deception in which the individual forgets his own desires and accepts dominant values as his own. Literature may be seen as something that reinforces dominant values and occasionally calls them into question. 19th century women writers of sentimental fiction used certain narrative conventions merely to reinforce dominant values, whereas a writer like Jane Austen used many of the same conventions to undermine the same dominant values.

The French Theorist Louis Althusser considers the relationship between literature and ideology. For him, this also includes an understanding of hegemony. He suggests that ideology and hegemony, like literature, present a constructed version of reality, one which does not necessarily reflect the actual conditions of life. Literature neither merely reflects ideology nor can it be reduced to it. Literature may be situated within ideology, but it can also distance itself from ideology thereby allowing the reader to gain an awareness of the ideology on which it is based. A novel may present the world in a way that seems to support dominant ideologies but as a work of fiction it also reveals those ideologies. Although literature itself cannot change society, it can be an active part of such changes.

24. Which of the following statements would be in line with Marx's views?
    1. Communism would arise as a realization of a pre-determined moral ideal.
    2. Marx believed that Economic and Social conditions determine political conditions.
    3. Stratification is the sign of a simplified society.
    4. Larger political and economic forces play a role in determining the consciousness of men.
    5. Literature determines the economic system of a society.

25. Jane Austen has been quoted as an example to show that
    1. No matter what, it is impossible to overcome one's class and economic background.
    2. Marxist theories cannot be applied to 19th century women writers of sentimental fiction.
    3. Literature can be used to undermine dominant values.
    4. Literature only reinforces the dominant values of the ruling class.
    5. Literature is a cultural production and cannot exist outside of it.

26. Which of the following is not talked about in Marxism?
    1. Breakdown of capitalism.
    2. Dialectic hegemony.
    3. Materialistic account of history.
    4. Base and superstructure.
    5. Ideologies.

27. A suitable title for the passage would be
    1. Marx's criticism of literature.
    2. Marx's theory and literature.
    3. Dominant literature.
    4. Model of History.
    5. Hegel's theory.
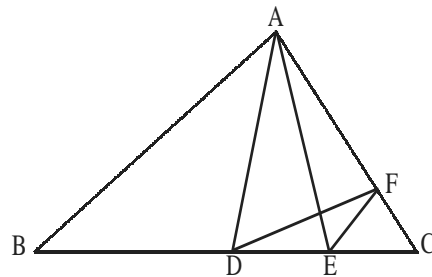
Sub-section II-A : Number of questions = 8

Note: Questions 28 to 35 carry one mark each.

28. The figure given below is to be cut into four equal parts such that each part has the same size and shape. The shape of each of these four parts should be similar to the shape of the figure given below. Find the perimeter of one of the four parts that has been cut.
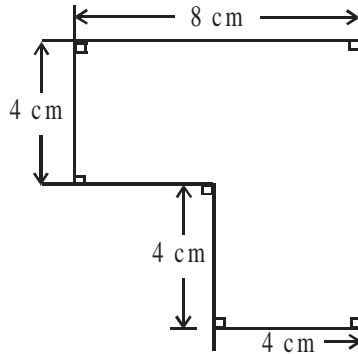
    1. 20 cm   2. 24 cm   3. 18 cm   4. 16 cm   5. 12 cm

29. If the sum of two distinct natural numbers is 50, then what is the maximum possible HCF of these 2 numbers ?
    1. 5   2. 7   3. 10   4. 11   5. 12

30. In a colony, 60% of the total population of the colony are men and 12% of the total population of the colony is literate. If 20% of the women in the particular colony are literate, then find the number of illiterate men in the colony as a percentage of the total number of men in the colony. [Assume, that every person in the colony is either literate or illiterate.]
    1. 80%   2. 83.33%   3. 92%   4. 93.33%   5. 96.66%

31. If the sum of the product of three positive real numbers taking two at a time is 11, then what is the maximum possible value of the product of these three numbers?

    1. $\dfrac{11}{3}$ 2. $6^{\frac{3}{2}}$ 3. $\left(\dfrac{11}{3}\right)^{\frac{3}{2}}$ 4. $\left(\dfrac{11}{2}\right)^{\frac{4}{3}}$ 5. None of these

32. In how many ways 3 identical books may be distributed among 5 students such that no student gets more than 2 books?
    1. 125   2. 64   3. 48   4. 40   5. 30

33. If A (3, 1) is one of the vertices of an equilateral triangle ΔABC of side $2\sqrt{3}$ units and BC is parallel to y = 0, then the coordinates of point B and C (not necessarily in the same order) are

1. $(3-\sqrt{3},-2)$ and $(3+\sqrt{3},-2)$

2. $(3-\sqrt{3},4)$ and $(3+\sqrt{3},4)$

3. $(3,1-\sqrt{3})$ and $(3,1+\sqrt{3})$

4. $(3-\sqrt{3},-2)$ and $(3+\sqrt{3},-2)$ or $(3-\sqrt{3},4)$ and $(3+\sqrt{3},4)$

5. $(3-\sqrt{3},4)$ and $(3+\sqrt{3})$ or $(3,1-\sqrt{3})$ and $(3,1+\sqrt{3})$

34. If the roots of equation $x^2 - 9x + p = 0$ are real and the difference between the roots is less than 7, then which of the following is always correct?

1. $0 < p < \dfrac{81}{4}$

2. $8 < p < \dfrac{61}{4}$

3. $8 < p < \dfrac{81}{4}$

4. $-8 < p < 0$

5. $-8 < p < \dfrac{61}{4}$

35. In the triangle $\Delta ABC,$ the measure of $\angle ABC$ and $\angle ACB$ is $40°$ and $60°$ respectively. If the measure of $\angle BAC, \angle ADE, \angle AED$ and $\angle EFC$ is same, then find the measure of the $\angle FDC$.

1. 15°   2. 20°   3. 25°   4. 30°   5. 35°

Note: Questions 36 to 40 carry two marks each.

36. Sumit committed a mistake in finding the LCM of three distinct positive integers greater than 1 namely A, B and C and found it to be 840, which is a common multiple A, B and C, but is not the lowest. The HCF of A, B and C is 1. Find the maximum possible value of A + B + C.
    1. 424　　　　2. 613　　　　3. 563　　　　4. 257　　　　5. 509

37. If the nth term of a series is given by $T_n = \dfrac{(n+4)!}{[n^2 - (n-1)^2]!}$ for $n > 1$, then find the least value of 'n' such that product of the first 'n' terms of the series is less than 1.[n! is the product of the first 'n' natural numbers.]
    1. 7　　　　2. 8　　　　3. 9　　　　4. 10　　　　5. 11

38. From the set of first 10 natural numbers, three distinct prime numbers a, b and c are selected to form a quadratic equation $ax^2 + bx + c = 0$, having real roots. Find the sum of the roots of all such possible quadratic equations that can be formed.

    1. $-\dfrac{19}{2}$　　　　2. $-\dfrac{27}{5}$　　　　3. $-\dfrac{87}{10}$　　　　4. $-\dfrac{149}{10}$　　　　5. None of these

39. Find the second right most non-zero digit in the number $N = 2470^{1613}$.
    1. 3　　　　2. 5　　　　3. 2　　　　4. 6　　　　5. 7

40. Given that a function f(x) = 0 holds true for only one real value of x. If the product of f(1), f(2) and f(3) is less than zero and f(2) is also less than zero, then which of the following cannot be a possible value of x for which f(x) = 0?

   1. –17　　　　2. $-\sqrt{61}$　　　　3. 0　　　　4. $\sqrt{5}$　　　　5. $2\sqrt{3}$

Note: Questions 41 to 54 carry three marks each.

41. In how many possible ways can two distinct numbers be chosen randomly from the set of first fifteen natural numbers such that the sum of the two chosen numbers is divisible by three but not by four.
   1. 24   2. 25   3. 26   4. 27   5. 28

42. A square sheet of paper, ABCD having dimension 4 cm × 4 cm is folded along the line AE such that BE = 1 cm and AECD is a trapezium. The point B coincides with point B′ and AB′ when extended meets EC at point F. Now, the folded sheet AECD is again folded along the line AF such that point E coincides with point E′. Find the area of the shaded region AE′FCD.
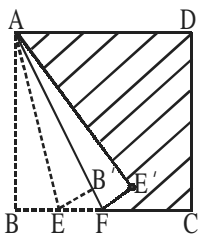
   1. $\dfrac{121}{15}$ cm^2 2. $\dfrac{133}{15}$ cm^2 3. $\dfrac{142}{15}$ cm^2 4. $\dfrac{167}{15}$ cm^2 5. $\dfrac{183}{15}$ cm^2

43. X and Y are stationed at points A and B respectively. Everyday X and Y start simultaneously from A and B to reach B and A respectively. Everyday they cross each other at a point R. From the point R, the time taken by X to reach B and the time taken by Y to reach A is 36s and 16s respectively. One particular day Y started late and during that time X had covered 20 km. Find the distance between the point R and the point where they met on that day.
   1. 12 km   2. 10 km   3. 16 km   4. 8 km   5. Cannot be determined

44. The total amount of money spent on the purchase of pencils, rubbers and pens is Rs. 45. The cost of one pencil, one rubber and two pens is Rs. 2, Rs. 3 and Rs. 8 respectively. The total number of pencils bought is greater and less than the number of pens and the number of rubbers bought respectively. How many different combinations of the number of pencils, rubbers and pens bought are possible?
   1. 1   2. 2   3. 3   4. 4   5. 5

45. A circle with radius 2 cm is circumscribed by two triangles ABC and ADE as shown in the following figure. It is given that DE = 7 cm, BC = 5 cm, AC = 13 cm and the measure of $\angle CBD = 90°$. Also it can be concluded that $GF = \dfrac{2BD}{BD + k}$, where 'k' is a real constant. Find the value of 'k'.
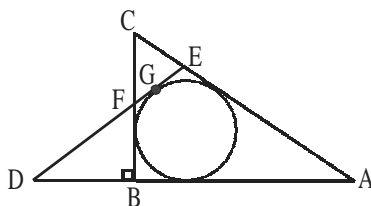
   1. 1   2. 2   3. 3   4. 4   5. None of these

DIRECTIONS for questions 46 and 47: Answer the questions on the basis of the information given below. A three-digit number exists such that the sum of the digits of the number is a multiple of 5 and the digit at the unit's place is thrice the digit at the hundred's place.

46. How many digits cannot be the digit at the ten's place of such a three-digit number?
     1. 2   2. 3   3. 4   4.5   5.6

47. Which of the following cannot be the remainder when such a three-digit number is divided by 17?
     1. 5   2. 15   3. 16   4. 4   5. 9

48. A function f(k) is defined as $f(k) = 1 - k + k^2 - k^3 + ... - k^{15} + k^{16} - k^{17}$ for all real values of k. If f(k) can be expressed as a polynomial function in 'm', where m = k + 1, then find the coefficient of m^2 in the polynomial function in 'm'.
     1. 680   2. 306   3. 153   4. 816   5. 136

49. The nth term of the series 5, –13, 25, –41, 61, –85 .... is denoted by T_n. Find the least value of 'n' for which $T_1 + T_2 + T_3 + T_4 + ... + T_{n-1} + T_n > 901$.
     1. 29   2. 30   3. 31   4. 33   5. 34

50. Given that the total number of terms in an arithmetic progression (AP) is odd. The sum of all the even placed terms is 7 and the sum of all the odd placed terms is 8.75. It is also given that the last term of this AP exceeds the first term by 2. Find the total number of terms in the AP.
     1. 5   2. 9   3. 11   4. 21   5. Cannot be determined

51. P is any point in a plane on which a rectangle ABCD having dimensions 12 cm × 8 cm is drawn such that both PAB and PBC are triangles. If PA:PB = 3:1, then which of the following can never be the ratio of the length of line segments PC and PB?
     1. 2:5   2. 3:5   3. 7:2   4. 1:2   5. 15:2

DIRECTIONS for Questions 52 and 53: Answer the questions on the basis of the information given below. In a cricket academy, there are 72 players. A player is either a "batsman" or a "bowler" or an "all-rounder". An all-rounder is a player, who is a batsman as well as a bowler. Further, each player in the academy was categorized into either category A or category B. There are 13 bowlers in category A and 23 players in category B are classified only as batsman. The aggregate number of players in the cricket academy is 6 times the number of all-rounders in the academy. The total number of all-rounders in category B is twice the

number of all-rounders in category A. It is also given that $\frac{2}{3} \leq \left[\dfrac{\text{number of batsmen in category A}}{\text{number of bowlers in category B}} \right] \leq 1$.

52. Which of the following cannot be the total number of batsmen in category A?
     1. 15   2. 18   3. 20
     4. Either (1) or (2)   5. Either (1) or (3)

53. A team comprising of 11 players is to be selected out of the players in category A. This particular team consists of exactly three players classified only as a batsman and exactly four players classified only as a bowler. If the number of batsmen in category A is minimum possible, then find in how many ways can this team be selected?
     1. 15250   2. 15420   3. 18640   4. 27720   5. 31200

54. Consider the given system of equations;
     $|y - 3| = |x + 3|$ for $-6 \leq x \leq 0$ and $0 \leq y \leq 6$,
     $y = 5a^x$ (a > 1)
     Find the minimum and maximum possible number of solutions for the mentioned system of equations.
     1. 1, 3   2. 2, 3   3. 0, 3   4. 0, 2   5. 1, 2

Sub-section III-A : Number of questions = 8

Note: Questions 55 to 62 carry one mark each.

DIRECTIONS for Questions 55 to 58: Answer the questions on the basis of the information given below. Chintamani, the versatile investor was looking at the investments that he had made a year ago. He had invested in 6 companies across 3 sectors viz. Telecom, Insurance and Retail.

The following table shows the change in the share prices of the 6 companies, which is disguised as A to F in no particular order in the table. Chintamani had purchased shares only in multiples of 10 on 5th June 2006.

Company	Share prices as on 5th June 2006 (Rs.)	Share prices as on 5th June 2007 (Rs.)
A	150	230
B	500	575
C	200	320
D	400	440
E	800	900
F	175	245

55. If the two Telecom companies showed the highest absolute variation in the share prices, while the two Insurance companies showed the lowest absolute variation, what was the approximate percentage change in the combined share prices of the two Retail companies?
   1. 20% 2. 24% 3. 30% 4. 40% 5. 15%

56. If Chintamani had purchased a total of 60 shares across 4 of the mentioned companies, then the maximum possible percentage return on investment as on 7th June 2007 based on the shares of those 4 companies could be
   1. 30% 2. 32% 3. 36% 4. 37% 5. 41%

57. If one of the two Telecom companies showed the highest percentage variation in the share price while the other Telecom company showed the lowest percentage variation, then what was the combined percentage change in the share prices of the two Telecom companies?
   1. 26.66% 2. 35.66% 3. 40.33% 4. 45.33% 5. 50.66%

58. If Chintamani had purchased a total of 40 shares equally divided among 4 of the mentioned companies, what can be the minimum possible percentage return that he would have got?
   1. 13.7% 2. 14.5% 3. 16.4% 4. 15.2% 5. 14.0%

	A	B	C	D	E	F
A	1	3	5	2	5	3
B	3	1	2	4	3	5
C	5	2	1	5	4	3
D	2	4	5	1	1	2
E	5	3	4	1	1	2
F	3	5	3	2	2	1

Among 5 variables A, B, C, D, E only two kinds of arithmetic operations is allowed. These operations are 'Pontiplication' (denoted by '×') and 'Civision' (denoted by '÷'). From the table given above, we can find the result of 'Pontiplication' or 'Civision' between any two variables by the following rules:

Rule I: 'Pontiplication' of B and D denoted by BD is the product of the first number in the row of B multiplied by the number common to the row of B and the column of D.
For example BD = B × D = 3 × 4 = 12.
But 'Pontiplication' of B and A denoted by BA is the perfect square of the first number in the row of B.
For example BA = B × A = 3 × 3 = 9.
This holds true for the 'Pontiplication' of any variable with A.

Rule II: Similarly the Civision of B and D denoted by $\dfrac{B}{D}$, is the ratio of the first number in the row of B to the number common to the row of B and the column of D.

For example $\dfrac{B}{D} = B \div D = 3 \div 4 = 0.75$.

But 'Civision' of B and A denoted by $\dfrac{B}{A}$ is the ratio of the first number in the row of B and that number itself. As a result, it will always be unity.

For example $\dfrac{B}{A} = B \div A = 3 \div 3 = 1$.

This holds true for the 'Civision' of any variable with A.

Rule III: 'Pontiplication' and 'Civision' operation with the same variable is not defined. For example, (B × B) or (B ÷ B) is not defined.

In the following questions, X and Y denote two distinct variables among A, B, C, D, E and F.

59.   The minimum possible value of (2XY – YX) is
       1. 0   2. –5   3. –7   4. –10   5. –15

60.   The sum of all the values of XY taken together is
       1. 284   2. 300   3. 312   4. 328   5. None of these

61.   The number of possibilities where X ÷ Y is not less than unity is
       1. 18   2. 20   3. 22   4. 24   5. None of these

62.   If all the values of $\left[XY + YX - \dfrac{X}{Y} \right]$ (Y completely divides X) are arranged in decreasing order which is

       the third highest distinct value ?
       1. 11   2. 15   3. 23   4. 29   5. 34

Note: Questions 63 to 67 carry two marks each.

DIRECTIONS for Questions 63 to 67: Answer the questions on the basis of the information given below. Eight persons were to participate in the five-day Annual Personality Contest at Altica Green but only 6 of them were present on the first day. The information about the time of joining of the remaining two persons was not known in the beginning. In the contest, the participants were asked to interact with each other under the observation of panel of judges. All interactions will happen only between two people and not in a group. Each of the participants had one of the following personality types, which were also ranked from 1 to 8 as depicted in the following bar chart:
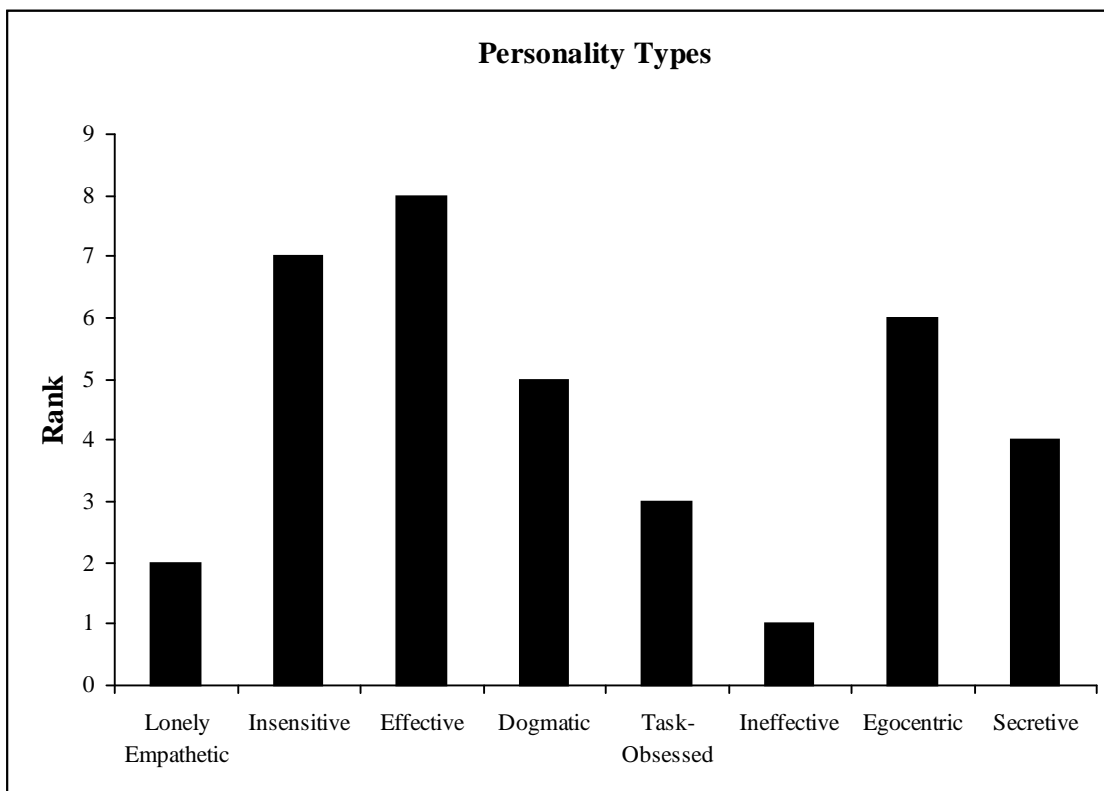
It was known that none of the 6 participants, who were there from the beginning, had a personality rank of 8.

The following table when studied horizontally shows the extent of the positive change in the rank attached to the personality type of any individual after an interaction with another participant. Wherever, there is a '0' in the table, it indicates there was no change of rank attached to the personality type of the concerned two people.

Effect of Interaction	Shradha	Radha	Shiv	Rajinder	Ashish	Sharma	Kuldeep	Lalchand
Shradha	—	2	3	1	2	0	2	1
Radha	1	—	2	2	1	2	0	3
Shiv	2	3	—	3	3	1	0	3
Rajinder	1	1	4	—	4	3	3	2
Ashish	3	1	3	4	—	3	6	2
Sharma	2	1	2	5	2	—	4	2
Kuldeep	1	0	4	4	3	2	—	0
Lalchand	2	3	3	3	1	1	2	—

For example if there is an interaction between Radha and Shradha, Radha's personality type will move up by 1 rank while Shradha's personality type will move up by 2 ranks. The Rank of any participant will keep moving up till it reaches the highest level 8. After reaching this stage there will be no change in the rank attached to the personality of an individual on further interactions, if any.

The average of the ranks of the 6 participants, who were there from the beginning, before the start of the competition was 4.5 and that average kept on changing at the end of each day depending on the interactions.

63. A seventh participant with a rank of 8 joined the contest at the end of the first day and interacted with Kuldeep on the second day. If there were no other interactions on the first and second days and the average rank of the 7 contestants at the end of second day was 5, then who was the seventh participant?
1. Sharma   2. Radha   3. Shiv   4. Lalchand   5. Cannot be Determined

64. Radha was one of the participants who started the event. She ended as 'Insensitive' personality at the end of the second day. If she had exactly one interaction everyday, the personality type having the lowest rank that Radha could have started with was
1. Ineffective   2. Lonely empathetic   3. Dogmatic
4. Egocentric   5. Secretive

65. All the people started the competition except for Kuldeep and Sharma and at the end of second days, there had been exactly three interactions between the contestants. What is the maximum possible change in the average rank of the 6 contestants, who were there from the beginning, at the end of the second day?
1. 3.00   2. 3.16   3. 3.25   4. 3.50   5. 3.83

66. A person started as a 'Lonely Empathetic' personality and after two interactions had become an 'Effective' personality. This person could be all of the following except
1. Shradha   2. Kuldeep   3. Sharma   4. Ashish   5. Lalchand

67. Ashish and Lalchand were absent on the first day in which there were only three interactions as follows:
i. Rajinder and Shradha
ii. Shiv and Radha
iii. Sharma and Kuldeep
What will be the average rank of the mentioned 6 contestants at the end of the first day?
1. 7.00   2. 6.5   3. 6.66   4. 7.5   5. 6.33

Note: Questions 68 to 81 carry three marks each.

DIRECTIONS for Question 68 to 72: Answer the questions on the basis of the information given below. Seven nodes in an integrated circuit are interconnected with each other such that an input signal can flow from any node to every other node. No signal is allowed to retrace its path and the signal cannot travel through the same node more than once. All signals reaching the node 'Y' is said to reach its destination and hence cannot travel further. All the signals travel at a speed of 5 nano-meter per mili-second through the given network. The following table illustrates the minimum and maximum distance between any two nodes in nano-meter (*nm*). For example, the minimum distance between the nodes 'N' and 'R' is 4 *nm* and the maximum distance to be travelled without violating any condition to reach 'R' from 'N' (or *vice-versa*) is 11 *nm*. First column of the table tabulates the number of paths emerging from or converging at a particular node.

Paths	Nodes	A	M	N	P	R	X	Y
3	A	0	3, 12	1, 10	2, 13	5, 11	8, 19	12, 26
4	M		0	3, 8	5, 11	2, 11	11, 17	10, 24
4	N			0	2, 11	4, 11	8, 17	12, 26
5	P				0	3, 12	6, 6	10, 25
4	R					0	9, 18	8, 25
2	X						0	7, 31
4	Y							0

68. An input signal emerging from 'P' reaches 'R' tracing the longest possible path. How many intermediate nodes the signal must pass through?
    1. 2   2. 3   3. 4   4. 5   5. 6

69. What is the path a signal must trace if it reaches 'X' to 'Y' through the longest path?
    1. X-P-A-N-R-M-Y   2. X-P-A-M-Y   3. X-P-N-A-M-Y
    4. X-P-N-M-R-Y   5. X-P-R-N-A-M-Y

70. If no signal can pass through the node 'P', then what is the length of the shortest path (in *nm*) from 'A' to 'Y'?
    1. 12   2. 13   3. 14   4. 16   5. 17

71. Which of the following can never be the time taken by an input signal to reach 'Y' from 'N'?
    1. 2.6 mili-second   2. 2.8 mili-second   3. 3.6 mili-second
    4. 4.2 mili-second   5. 4.6 mili-second

72. If a device is installed at node 'N' which delays the passing signal by 0.4 mili-second, then in how many of the following cases, the time taken by the signal to reach its destination will get affected?
    I.   Signal moving from 'X' to 'M' through the shortest path
    II. Signal moving from 'R' to 'Y' through the longest path
    III. Signal moving from 'A' to 'Y' through the shortest path
    IV. Signal moving from 'P' to 'Y' through the shortest path
    1. 0   2. 1   3. 2   4. 3   5. 4

	PHYSICS				CHEMISTRY				MATHS				
	I	II	III	S1	I	II	III	S2	I	II	III	S3	S
A	13	12				11	11		8	9			36
B	20			16			1	9			20		40
C	18			15	11			15			5		42
D		14				19		16	14		3	9	
E		20	2		15			16		18	5		42
F	17	17	5		18	20			16		7		43
G	19			16	4	19	19			20			48
H	10	16			6	11			19			15	

The table given above, shows the marks secured by eight students in an entrance examination conducted by a reputed engineering college. Their were only three subjects viz. Physics, Chemistry and Maths having three papers viz. I, II and III in each of the subjects. Each paper was of 20 marks. Furthermore, S1, S2 and S3 represents the average marks obtained in each of the subjects and S represents the sum of S1, S2 and S3. All students appeared in all the papers and no student has scored zero marks in any of the given papers. Following information is also available:

(i) Average marks of all students in Physics I, Physics III, S1, S2 and Maths III papers are 16, 12, 14, 14 and 10 respectively.

(ii) Excepting the marks already mentioned in the table no student has secured 20 out of 20 in any of the papers.

(iii) A and H secured equal average marks, a prime number, in Physics.

(iv) G scored a total of 47 marks in Physics II, III and Maths I paper.

(v) Average marks secured by A and H in Chemistry are distinct prime numbers.

(vi) Marks secured by the students in all the papers and the values of S1, S2 and S3 are always integers.

73. Which of the following can never be the sum of the marks secured by A and H in Physics III paper along with E in Physics I paper?
1. 29　　　　2. 32　　　　3. 35　　　　4. 41　　　　5. 44

74. The sum of average marks secured by F and H in Chemistry is
1. 29　　　　2. 28　　　　3. 23　　　　4. 22　　　　5. Cannot be determined

75. Which of the following can be the average marks secured by D in Physics?
1. 12　　　　2. 13　　　　3. 16　　　　4. 17　　　　5. 18

76. The marks secured by F in Maths II paper is
1. 11　　　　2. 13　　　　3. 16　　　　4. 19　　　　5. Cannot be determined

77. What is the sum of marks secured by A and H in Maths III paper?
1. 38　　　　2. 32　　　　3. 28　　　　4. 24　　　　5. Cannot be determined

DIRECTIONS for Questions 78 to 81: Answer the questions on the basis of the information given below. Six and one-third dozens of eggs were ordered by Mr. Anthony Ganzalves for his Easter party. However, the farm owner Mr. Rajnish, who was supposed to supply the eggs, could not meet the requirement at one go. He hired four delivery boys A, B, C and D, who among themselves delivered the full order. But the constrain was that they can deliver one by one and each of them can carry a prime number of eggs. It is known that A and D together carried number of eggs that are multiples of 4 and have 6 positive factors.

78. The number of ways in which Mr. Rajnish can get the eggs delivered, so that B and C together deliver the maximum number of eggs is
    1. 12   2. 16   3. 20   4. 24   5. 36

79. If A and C deliver three and one-third dozen of eggs together then in how many possible ways the delivery can be executed?
    1. 5   2. 6   3. 7   4. 8   5. 9

80. The number of ways in which Mr. Rajnish can get the eggs delivered, so that B and C together deliver the least number of eggs is
    1. 8   2. 10   3. 14   4. 18   5. 28

81. The total number of ways in which Mr. Rajnish can get the eggs delivered is
    1. 144   2. 150   3. 166   4. 176   5. 196