_____

MOCK CAT

SECTION – I

Directions for questions 1 – 5: Each question is a logical sequence of statements with a missing link, the location of which is shown parenthetically. From the five choices available you are required to choose the one which best fits the sequence logically.

1. Recently, I had difficulty with one of my tyres so I went to the tyre store to get it replaced. Much to my chagrin, the service attendant identified a small problem with another tyre, which indicated the front end was out of alignment. He explained that if I did not correct the alignment, I would soon be replacing yet another tyre. Needless to say, realigning the front end of my car cost money, but the investment actually saved me additional costs in the future. The attendant (salesperson) did not cause the problems; he simply identified the problem and offered a solution, (_____) We do not create problems; we identify them and offer solutions through our goods and services.
   (1) which in any case was his duty to do
   (2) which we ought to do in the first place
   (3) which is exactly what the professional does
   (4) and saved me a lot of hassle
   (5) but isn't that what all of us are bound to do if we are true professionals?

2. Woolf's focus on society has not been generally recognized because of her intense antipathy to propaganda in art. (_____). Even when Woolf is fundamentally sympathetic to their causes, she portrays people anxious to reform their society and possessed of a message or program as arrogant or dishonest, unaware of how their political ideas serve their own psychological needs. (Her Writer's Diary notes: "the only honest people are the artists." whereas "these social reformers and philanthropists...harbor...discreditable desires under the disguise of loving their kind...") Woolf detested what she called "preaching" in fiction, too.
   (1) Her detestation of the apathetic is palpable.
   (2) She disregards their objectives, howsoever noble they might have been.
   (3) She feels that they unnecessarily force their views and judgments down the peoples' gullets.
   (4) The pictures of reformers in her novels are usually satiric or sharply critical.
   (5) There are several instances in her writings to prove the point.

3. Feynman on religion is interesting mainly because he clearly feels the need to tread very carefully for fear of offending too many people. He divides religion up into three parts: the metaphysical (creation myths and so on), the ethical and the inspirational .His analysis is that science undermines the metaphysical part but has no effect at all on the ethical, because, in fact, (_____). He laments the fact that the undermining of the metaphysical takes a lot of air out of the sails of the inspirational part, but his view is that the picture of the universe presented by science is pretty inspirational itself.
   (1) science has nothing to do with the ethics of religion
   (2) scientists have pretty much the same ethical values as everyone else
   (3) ethics and inspiration are irretrievably intertwined
   (4) scientific laws do not seek to confront ethical values
   (5) science does not moralise as ethics do

_____

_____

4. In contrast to the early discoveries of exoplanets, we now find that less than 1 in 5 exoplanets are to be found very close to their stars, a few orbiting with a period of 5 to 50 days (_____). This supports the idea that they are formed at Jupiter-like distances from their host star. Dependent on the details of the early solar system, most giant planets probably spiral inwards towards their star until they reach a point where a lack of frictional forces stops their further migration.

    (1) much closer to their host star than mercury is to our sun.
    (2) and a few others even more distant than Jupiter is to our sun.
    (3) while most others are almost at the edge of the host star's planetary system.
    (4) the majority having spherical orbits at Jupiter-like distances.
    (5) but most giant planets are orbiting at large distances from their host stars.

5. In times past a liberal education set off a free man from a slave or a gentleman from labourers and artisans. It now distinguishes (_____) or from the trivialities which are no training at all. Such an education involves a combination of knowledge, skills, and standards.

    (1) scholarly learning from the loading of abstract concepts by the hoi polloi
    (2) maturation of minds from conceptual enlightenment
    (3) whatever nourishes the mind and spirit from the training which is merely practical or professional
    (4) practical skills from compartmentalized learning with narrow focus
    (5) pursuit of knowledge per se from the dissemination of anachronistic ideas

Directions for questions 6 – 10: Identify the incorrect sentence or sentences.

6. A. Once at greenwood, we walked the familiar hilly path to great grandma Van Patten's grave.
    B. As we talked, I felt myself relaxed forgetting the tensions of unemployment.
    C. With 10 children and one on the way, every day was a bit hectic.
    D. She was always there, her steady blue eyes shinning, her voice encouraging, her gentle touch conveyed her trust and love for the little boy.

    (1) B   (2) B and C   (3) A and C   (4) B and D   (5) A and B

7. A. A mad scramble and we were off, running and stopping, peering and bobbing, as we hunted for epitaphs of long ago.
    B. I found a tall, leafy tree and leaned against it's massive trunk.
    C. A missionary was serving as a medic at a small field hospital in Africa.
    D. She began to describe the sceneries of Manali streets as she would to a blind tourist.

    (1) B and D   (2) A and C   (3) A, B and C   (4) A   (5) B and C

_____

_____

8.   A.   Periodically he had to travel with bicycle through the jungle to a nearby city for supplies.

      B.   I looked back at Mandeep, seated besides her.

      C.   Frantic to escape, I tried forcing my body through the half open window.

      D.   I realized then that teaching me a skill and providing me an opportunity to make few bucks were far less important to him than the time we spent together.

      (1) C and A   (2) A and B   (3) A, B and D   (4) A and D   (5) B and C

9.   A.   I had such wonderful plans laid out for my life, and they all seemed to be right in track.

      B.   She is one of those who has sought the warmth of a fire that got out of hand.

      C.   The wife was afraid that if she told him they had just won such a large sum, he would have another heart attack and die.

      D.   Walking beside my husband and meeting his needs was a challenge, and God gave me the strength to meet those challenges one step at a time.

      (1) A and B   (2) C and D   (3) A, B and C   (4) B, C and D   (5) A and D

10.   A.   The political system of the allied powers is essentially different from America.

      B.   Taiwan and Korea had systems originating in government by corrupt oligarchies which left a legacy of malpractice after even the political scenery had changed.

      C.   The IMF is still reeling under the shock of the barrage of criticism it received over their handling of the Asian Crisis.

      D.   A dangerous coincidence of circumstances laid behind the great Asian Miracle.

      (1) B and C   (2) C and D   (3) A and C   (4) A, B, C and D   (5) A and B

Directions for questions 11 – 15: Each of the following questions has a paragraph with one italicized and underlined word **that does not make sense**. Choose the most appropriate replacement for that word from the options given below that paragraph.

11.   Focusing on applications and the effective and efficient implementation of the programme will move the companies closer to ***Arthurian*** integration of e-learning into their organization's performance management and other key processes.

      (1) botched   (2) gross   (3) seamless   (4) universal   (5) wholesome

12.   That is the theme running through the trend discussion; a theme easily summed up in one word: ***excrescence***. It is increasingly being used in harmony with other management tools, providing managers with a unified view of all financial, customer and employee concerns.

      (1) obsolescence   (2) concurrence   (3) adherence

      (4) convergence   (5) confluence

13.   You have to go out '***garroting***' up data from people's memories. You can then slice it and dice it to see what is really working and what isn't.

      (1) scraping   (2) scouring   (3) touching   (4) burnishing   (5) licking

_____

_____

14. The link is needed to ensure that the skills learned in training are ***detruded***, developed, and reinforced further on the job, and that people are held accountable for their own performances.

(1) remodeled   (2) shuffled   (3) interchanged   (4) metamorphosed   (5) calibrated

15. The physical universe is an expression of consciousness of the Creative Principle that manifests itself as 'energy', inextricably interconnected and an exact ***persiflage*** of the whole infinite universe. Despite the illusory perception of separateness that we experience, our minds remain connected to the whole universe at all 'times'.

(1) delineation   (2) explanation   (3) rendition   (4) metaphrase   (5) variant

Directions for questions 16 – 25: Read the following passages and answer the questions given at the end of the passage.

PASSAGE – I

Marxian criticism deals with certain undisputable facts, which have excited the interest of many critics, and scholars'. If Karl Marx and Frederick Engels are better known for their political and economic rather than literary writings, this is not in the least because they regarded literature as insignificant. Leon Trotsky once aptly remarked that there were many people in this world who thought as revolutionists but felt as philistines, but Marx and Engles were of a different genre. Marx was the youthful author of a comic novel; he wrote on art and religion, and planned a journal of dramatic criticism, a full-length study of Balzac, and a treatise on aesthetics. It is discovered from the autobiographical details of Marx's life that art and literature were part of the very air Marx breathed, as a cultured German intellectual. Marx was a regular theatre-goer, a declaimer of poetry, a voracious reader who had read every species of literary art from Augustan prose to ballads.

But Marx and Engels had rather more important tasks on their hands than the formulation of a complete aesthetic theory. They have become the exponents of sociology of literature concerned chiefly with literary production, distribution and exchange of a particular society. This new approach was followed as Marx came under the influence of Hegel and enunciated the Dialectical Theory of Materialism to explain the economic impact on human relations. The chief aim of Marxist criticism is to explain the literary work more elaborately, and this means a sensitive attention to its forms, and meanings as the products of a particular history. For Marx, the greatest art is that which timelessly transcends its historical conditions. In fact, historical analysis of literature did not begin with Marxism. Many thinkers opine that Marx had tried to account for literary works in terms of history. Hegel had a profound influence on Marx's sociological thoughts. The originality of Marxist criticism lies not in its historical approach to literature, but in its revolutionary understanding of history. The seeds of that revolutionary understanding are planted in his famous passage which states "consciousness does not determine life; life determines consciousness". Marx observes, "in the social production of their life, men enter into definite relations that are indispensable and independent of their will, relations of production which correspond to a definite stage of development of their material productive forces. In economic determinism, the sum total of these relations of production constitutes the economic structure of society. Marxian sociological system states that the real foundation on which is raised a legal and political

_____

_____

superstructure is the economic set up and the economic needs of man actually lead to his social consciousness.

In Marxian dialectical determinism, relations between men are bound up with the way they produce their material life. The development of new modes of productive organization is based on a changed set of social relations – this time between the capitalist class who owns these means of production, and the proletariat class whose labor power the capitalist buys for profit. Briefly stated, these relations of production are called the economic structure of society. From this economic base, in every historical period, emerges a superstructure – certain forms of law and politics, a certain kind of state, whose essential function is to legitimate the power of the social class which owns the means of economic production. This superstructure also consists of definite forms of the political, religious, ethical, and aesthetic, called ideology. In Marxian terminology, the function of ideology is to legitimate the power of ruling class in society.

Art then for Marx forms the part of the superstructure of society. To understand literature means understanding the total social process of which it is part. In fact, the social mentality of an age is conditioned by that age's social relations; literary works are not mysteriously inspired, or explicable simply in terms of their author's psychology. They are forms of perception, particularly ways of seeing the world; and as such they have a relation to the social mentality or ideology of an age. Men are not free to choose their social relations; they are constrained into them by material necessity.

To understand Shakespeare's King Lear and Pope's The Dunciad, we have to do more than interpret their symbolism; we have to understand their social history, the relevance of their themes, preoccupations in a particular society. Since ideology is always a complex phenomenon, we have to understand and analyze the precise relation between different classes in a society. Interestingly, the pessimism of Conrad's worldview is rather a unique transformation into an art of an ideological pessimism rife in his period. Every writer is individually placed in society; it also penetrates to the realities of man's experience in a certain situation. Marxist criticism sees that in the absence of revolutionary art, only radical conservatism could produce the most significant literature. It would be a mistake to infer that Marxian criticism moves mechanically from "text" to "ideology" to "social relations" to productive forces. Thus, literature may be part of the superstructure, but it is not merely the passive reflection of the economic base.

16. Marx's sociological ideas of literature, as conceptualized in the passage, can best be described as
    (1) Utopian, as his ideas are impractical and unrealistic based on his theory of dialectical materialism derived from Hegel
    (2) Hypothetical, as his ideas are not empirically verified by any society in the East or the West.
    (3) Revolutionary, as he is concerned about the social welfare of the proletariat in society, struggling against the capitalist class who owns the means of production.
    (4) Historical, as he investigates history from feudalism to capitalism.
    (5) Materialistic, for men enter into definite relations of production, and the material productive forces constitute the real foundation of society.

_____

_____

17. Why according to the author have Marx and Engels become the exponents of the theory of sociology of literature?

(1) The Marxian criticism concerns itself with the superstructure of society, based chiefly on material productive forces; the literary production and evaluation being only a reflection of the history of society, which produced it.

(2) Marxian criticism examines the sociological relevance of a work of art; it examines the serious aesthetic tastes of the people living in a community.

(3) Marxian criticism brings into focus the historical antagonism between the Feudalism and Capitalism.

(4) The Marxian Criticism examines art and literature not from aesthetic angle but from the deterministic point of view.

(5) Marxian criticism is a part of the base and super structure of his ideology.

18. What can be best inferred from the passage about the "base" and "superstructure"?

(1) All ideas and concepts are the direct flow of materialistic behavior of man. The growth of superstructure emerges from this base of society.

(2) Base is an expression of definite relations of production determining the tastes of men in society.

(3) Base is quite independent from the "superstructure". It defines and regulates man's relations with the productive forces and governs his social consciousness.

(4) "Base" and "superstructure" are dialectically linked together; base forms law and politics, super-structure forms the historical antagonism of capitalists and the proletarian class.

(5) The depiction of dichotomy between 'base' and 'superstructure' is in its best form in Marxian ideology.

19. Which of the following statements sum up the passage?

(1) Marx and Engels were revolutionary critics of society who rejected the traditional approach to literature and propounded deterministic view of art and literature.

(2) For Marx and Engels, social life constitutes the economic structure of society. The mode of production of material life conditions the social and political life; hence, it is the consciousness that determines life.

(3) It is the economic structure of society, which governs all human relations; art and literature emerge from this social structure.

(4) Art and literature of a society are the forms of perceptions of Marx and Engels' particular ways of seeing the world or interpreting differently class-relations.

(5) Art and literature emerge from the superstructure of a society; they promote the social ideology and act as determinants of taste.

_____

_____

20.   What does the assertion 'consciousness does not determine life, life determines consciousness' imply?

(1)   Mind and spirituality are insignificant things in life; it is the mundane existence that take precedence.

(2)   Art is not primary requirement of life, social factors are.

(3)   Art and literature do not determine life, the economic needs create art and literature.

(4)   Social structure of society is the only reality and the economic needs determine life.

(5)   Art and literature cannot be abstracted from social and economic structure.

PASSAGE – II

In his famous essay, Hero as a Man of Letters, Carlyle discussed the various traits of a hero at the metaphysical level and regarded heroism as a godly virtue. Carlyle eulogized Robert Burns and Rousseau who devoted their lives to transform society by their revolutionary ideas. Carlyle contends that no one can forget the contribution of Rousseau who gave the ideals of Liberty, Equality and Fraternity to the world. Rousseau made serious efforts to free French people from the quagmire of conventionality and dogmatism. Carlyle wrote a full-length treatise on the idea of Heroism in the great Victorian age and published essays to depict the exceptional qualities of a hero.

In classical literature, Herodotus, Plato and Socrates have enumerated invincible spirit, dogged determination, and a rare stoicism in the blood as the exceptional qualities of a hero. John Milton wrote Paradise Lost, and in the first two books of the great epic created Satan, eulogizing these heroic qualities in his character. Critics unwittingly alleged that Milton belonged to the Devil's Party. Shakespeare, in his great tragedies, created Macbeth, Hamlet, King Lear and Othello who were towering personalities struggling against the forces of society and Nature to bring order out of chaos. They believed that God has sent man to explore the objective reality. Since antiquity, the evil has been enveloping each society. God sent heroes from time to time to assume warlike attitude against evils, and to this military attitude, we give the title of heroism. It is a self-trust and inner strength of the soul which gives nuclear energy to a hero to fight the odds of life and to suffer the anguish, alienation and privation smilingly.

Socrates was made to drink the cup of poison, Jesus was crucified, but they were great heroes who came into this world to give peace and eternal happiness to humankind and fought against evils and dogmatism heroically. The hero cannot be shaken and he cannot lose his balance and presence of mind; he is always inspired by his own inner music and is always above the trivial things of life. He enjoys a rare pride of the soul called hubris in Greek language, Aristotle in his Poetics called this 'hamartia, the Zen Buddhists called this detachment of life. There is not something philosophical but it is the instinctive mental faculty to follow the unbeaten track of life, to be the torchbearer. Whatever he does is of highest order but is not always understood by the traditionalists. He finds a rare divine spark in him; he is not worried about his physical comforts and he is always ready to make supreme sacrifice without bothering about life, health, and dangers of existence. Heroism always works against the voice of the multitude that is dogmatic, resists change, and thus turns against him. Heroism is individualism, to follow the dictates of conscience and to become unanswerable to any external agency. All heroic actions are condemned and censured by the 'prudent' men

_____

_____

who protect the society. Heroic action is eulogized after the death of the hero but in his lifetime, the people do not have the inner strength to understand his ideas. Heroic actions are extolled only after death. A hero has a rare self-trust and his soul is at war, there is an inner urge to fight against the evil, falsehood, mediocrity, mendacity, dogmatism, conventionality, and the agents of evil. There is an inner strength, a Promethean fortitude not to be wearied out in the face of odds. A hero has boundless courage, a fine spirit, and his heart is the fountain of love. The soul of a hero is poetic, sensitive, elegant, romantic, passionate but calculating, committed to the service of humanity.

A Shakespearian hero does not sell his soul for worldly comforts, he lives with penury, remains calm and cheerful in adversity and derides plenty and loves austerity of life. The heroic soul does not sell its justice and its nobleness. It does not ask to dine nicely and to sleep warm. The essence of heroism is the perception that virtue is not enough. Poverty is its ornament. It does not need plenty, and can very well abide its loss. Great people exhibit good humor and hilarity in adverse situations. They attain a height of nobility goodness and grandeur and dignity beyond the imagination of common people. A hero loves persistency, generosity, benevolence, fortitude; the heroic times are the times of terror. A hero shines like a pole star in the firmament of heaven forever and forever.

21.   Which of the following statements about heroism is most directly derived from the passage?
   (1)   Heroism is a war like attitude to encounter the evils of life and society.
   (2)   Heroic deeds are rare and intellectual deeds; the heroic actions are not guided by any philosophy or divinity.
   (3)   Heroic will is transcendental in nature as heroism works in contradiction to the voice of society.
   (4)   Heroism is an inner spiritual wisdom, which inspires an individual to take independent and unconventional decisions unmindful of the social laws.
   (5)   Heroic actions are bold and impulsive and are resisted by the antagonists.

22.   Which of the following sentences extracted from the passage best states the central idea?
   (1)   "God sent heroes from time to time to assume warlike attitude against evils, and to this military attitude, we give the title of heroism".
   (2)   "It is a self-trust and inner strength of the soul which gives nuclear energy to a hero to fight the odds of life and to suffer the anguish, alienation and privation smilingly."
   (3)   "Whatever he does is of highest order but is not always understood by the traditionalists. He finds a rare divine spark in him; he is not worried about his physical comforts and he is always ready to make supreme sacrifice."
   (4)   "Heroism is individualism, to follow the dictates of conscience and to become unanswerable to any external agency."
   (5)   "Heroism always works against the voice of the multitude that is dogmatic, resists change, and thus turns against him."
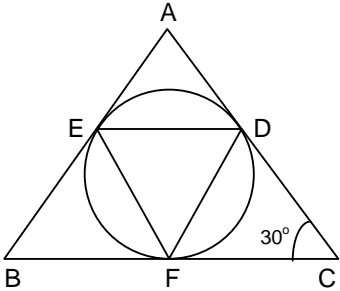
_____

_____

23. The primary purpose of the passage is

    (1)   to enumerate and eulogize the various traits of a hero in classical and renaissance literature

    (2)   to propound a philosophical treatise on heroism.

    (3)   to highlight the cult of heroism from modern perspective.

    (4)   to illustrate the effects of heroic deeds on society.

    (5)   To discuss heroism as a quality of mind that dares to differ and act in philanthropic interest against all odds.

24. According to the passage, the author has dealt with which all of the following?

    I   Heroism is a rare inborn quality in exceptional people who believe in reason and esoteric pursuits.

    II   Heroism leads to sufferings due to the wrath of the antagonists; it is an expression of pride and war-like persistence in a spirit to fight.

    III The essence of heroism is fortitude, a free will to think and to act unmindful of the repercussions

    (1) I   (2) I and II   (3) II and III   (4) III   (5) All the above

25. What is the tone of the passage?

    (1) Facetious   (2) exemplary   (3) analytical   (4) hyperbolic   (5) adulatory

_____

_____

SECTION – II

26. A boy is playing on the slope of a park of height of 6 m. Starting from the ground, when he covers a horizontal distance of 2.1 m along the slope, which reaches 30% of the actual height above the ground. How much distance should he cover to be at 15% of the actual height?

(1) 6.9 m   (2) 0.45 m   (3) 0.80 m   (4) 1.8 m   (5) 0.20 m

27. A container contains pure orange juice. Harish mixes pure water equal to $\frac{1}{4}$ th of the volume of the orange juice in the container. Manish does not know it and sells $\frac{1}{4}$ th of this mixture and adds water to it to replenish the quantity that he sold. What is the current proportion of water and orange juice in the container?

(1) 2 : 3   (2) 3 : 2   (3) 1 : 3   (4) 3 : 4   (5) 4 : 3

28. $P = 7^{3n} - 3^{5n}$, when n is a positive integer. Which of the following would always divide P?

(1) 100   (2) 150   (3) 225   (4) 250   (5) 175

29. If $\log_{36}5 = a$ and $\log_{30}3 = b$, $\log_8 30 =$

(1) $3(1 - a - b)$ (2) $\frac{1}{3(1-a-b)}$ (3) $\frac{3}{(1-a-b)}$ (4) $\frac{1-a-b}{3}$ (5) None of these

30. If $N = 1000^8 - 8$, what is the sum of its digits?

(1) 200   (2) 207   (3) 208   (4) 209   (5) 175

31. What is the remainder when $\sum\limits_{n=1}^{3000} n^5$ is divided by 4?

(1) 0   (2) 1   (3) 2   (4) 3   (5) 4

32. P is a point on the side AD of a square ABCD whose area is 64 cm^2. The perpendicular to the line PC at C meets the line segment AB extended at Q. If the area of $\triangle$CQP is 50 cm^2, the length of BQ is

(1) 12 cm   (2) 6 cm   (3) 4 cm   (4) 3 cm   (5) 2 cm

33. If p, q, r, and s are four positive real numbers, the minimum value of $\frac{p}{q} + \frac{q}{r} + \frac{r}{s} + \frac{s}{p}$ is

(1) 1   (2) 2   (3) $2\sqrt{2}$ (4) 4   (5) 5

34. If m is an integer, what is the value of m for which $m^4 - 20m^2 + 4$ is a prime number?

(1) 0   (2) 1   (3) 2   (4) more than 2   (5) None of these

_____

_____

Questions 35 – 36 are based on the following information.

Distance between TCY Ludhiana and TCY Jalandhar is less than 100 km. Aman started from TCY Ludhiana and after 10 hours; he came across a milestone showing the distance between it and TCY Ludhiana. He moved further and 2 hrs later; he came across another milestone showing the distance, exactly reverse of that shown by the previous milestone.

35. The total distance covered by Aman when he reaches the second milestone is
     (1) 64 km   (2) 54 km   (3) 76 km   (4) 65 km   (5) 70 km

36. What is Aman's speed?
     (1) 4.5 km/hr   (2) 4.6 km/hr   (3) 4.6 km/hr   (4) 5.6 km/hr   (5) 3.2 km/hr

37. Two cars A and B, 1 km apart, are travelling in the same direction with speeds of 58 km/hr and 40 km/hr respectively. What will be the distance (in m) between them 15 seconds before A collides with B?
     (1) 25 m   (2) 5 m   (3) 75 m   (4) 80 m   (5) 60 m

38. If P is a number having exactly two divisors, what is the remainder when $(P - 2)!$ is divided by it? .
     (1) 1   (2) – 1   (3) – 6   (4) – 5   (5) cannot be determined

39. In $\triangle ABC$, as shown in the following figure, the sides are tangential to an inscribed circle at DEF. If $\angle C = 30^{o}$, the measure of $\angle DEF$ is
     (1) 60° (2) 100°
     (3) 75° (4) 55°
     (5) none of these

40. $\log_k x = 6$ and $\log_{25k} 8x = 3$, then k =
     (1) 12.5   (2) $\sqrt{12.5}$ (3) $(12.5)^{2/3}$ (4) $(12.5)^{2}$ (5) None of these

41. A vessel contains V litres solution of milk and water in the ratio 3 : 2. If 10 litres of water is added and the concentration of milk in the resultant solution lies between 50% + 40%, find the range of values of V?
     (1) $50 \leq V \leq 60$ (2) $20 \leq V \leq 50$ (3) $30 \leq V \leq 40$
     (4) Data insufficient   (5) None of these

_____

_____

42. Two squares can be inscribed in a right-angled triangle in different positions, as shown in the following figures. The area of the first square is 441 cm^2 and that of the second square is 440 cm^2. Find the ratio of the two shorter sides of the triangle.
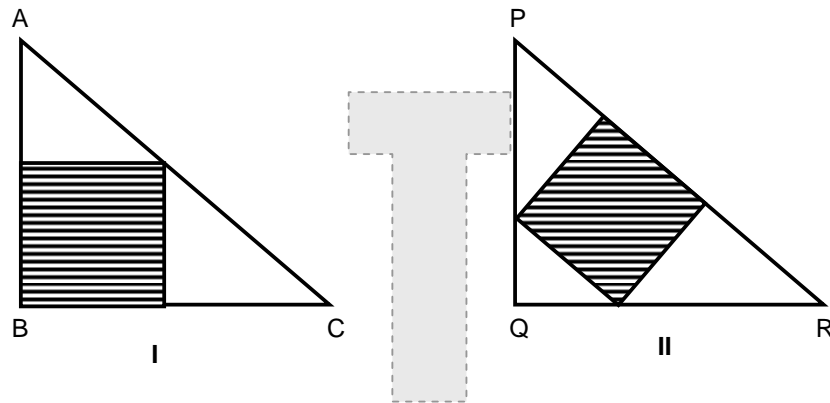

(1) 43 cm (2) 86 cm (3) 462 cm (4) 254 cm (5) None of these

43. In a survey, it was found that the number of students in the college has increased by 20% over the previous year. The number of boys has increased by 10%, whereas the number of girls has increased by 35%. Find out the present percentage of girls in the college.

(1) 40% (2) 45% (3) 55% (4) 75° (5) can't determine

44. 10000! = $(100!)^K \times$ P, where P and K $\in$ I. What can be the maximum value of K?

(1) 97 (2) 102 (3) 103 (4) 104 (5) 107

45. There are two cubes painted. The first cube has 5 faces painted red and one face painted blue. The second cube has some faces painted red and some painted blue. When the two cubes are rolled simultaneously, the probability of both the cubes coming up with the same colour is $\dfrac{1}{2}$. How many faces of the second cube are painted red?

(1) 1 (2) 2 (3) 3 (4) 4 (5) 5

Directions for questions 46 – 47:

In a question paper, there are 30 questions. If a person answers a question correctly, he is awarded 5 marks and if he gives wrong answer, he gets –2 marks. There is no negative marking for not attempting any question.

46. Priya secured 60% of the maximum marks in the paper. If a denotes the number of correct attempts and b denotes number of incorrect attempts, the total number of pairs of attempts (a, b) by Priya can at most be

(1) 2 (2) 4 (3) 6 (4) 8 (5) None of these

_____

_____

47. How many natural numbers less than 150 can never equal the marks secured by any student taking the test?

   (1) 0   (2) 6   (3) 10   (4) 8   (5) 12

48. If x is real, and $(a^2 + b^2)x^2 + 2a(b + c)x + (a^2 + c^2) = 0$, which of the following equations will always be true?

   (1) $c^2 = ab$ (2) $b^2 = ac$ (3) $ab + bc + ca = 0$

   (4) $ab - bc - ca = 0$ (5) $a^2 = bc$

49. If $a + b + c = 6$, what is the maximum value of $a.b^2.c^3$?

   (1) 108   (2) 64   (3) 72   (4) 144   (5) 188

50. What is the probability of hitting a dart 1 cm away from the corner of a cardboard of dimensions 10 cm × 8 cm.

   (1) $\dfrac{22}{141}$ (2) $\dfrac{11}{140}$ (3) $\dfrac{11}{280}$ (4) $\dfrac{11}{141}$ (5) can't determine

_____

_____
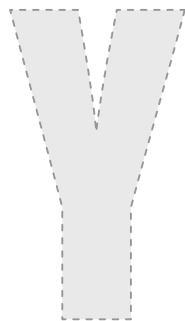
SECTION – III

Directions for questions 51 – 55:

In 2007 cricket world cup, 16 teams (nations) participated. All the 16 teams were grouped as follows.

Group A	Group B	Group C	Group D
India	Pakistan	Australia	New Zealand
Sri Lanka	West Indies	South Africa	England
Bangladesh	Ireland	Holland	Scotland
Bermuda	Zimbabwe	Kenya	Canada

In the league matches, each team played a match against the other 3 teams of the same group. The top two teams in each group qualified for the quarter finals. Of the two top teams from a group, the team that won the match in league round against the other team carried 2 points to the next round. In quarter finals, each team played a match against all other teams except the team from the same group.

A win earned two points, a draw earned 1 and a defeat earned nothing.

And no two teams from the same group got the same number of points in the league round. The following data represents the points secured by each team after quarter final matches.

India - 12   Australia – 10

Sri Lanka – 8   South Africa – 10

Pakistan – 6   New Zealand – 5

West Indies – 1   England – 4

Also, India lost to Australia, which lost to both England and New Zealand in the quarter finals.

Answer the following questions on the basis of the above data.

51.   Which teams have won 'Sri Lanka vs. South Africa' and 'Sri Lanka vs. New Zealand' matches?

(1) Sri Lanka, Sri Lanka   (2) Sri Lanka, New Zealand

(3) South Africa, Sri Lanka   (4) South Africa, New Zealand

(5) Cannot be determined

52.   Which team/teams was/were defeated by New Zealand in the quarter finals?

(1) Australia and Sri Lanka   (2) Australia and Pakistan

(3) Australia only   (4) India

(5) Australia and South Africa

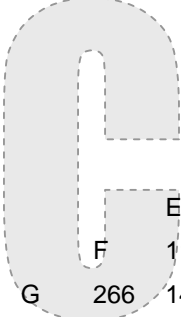53.   Which teams were defeated by Pakistan in the quarter finals?

(1) Sri Lanka and England   (2) South Africa and New Zealand

(3) Sri Lanka and New Zealand   (4) New Zealand and England

(5) Australia and Sri Lanka

_____

_____

54. After scheduled quarter finals, if each team plays one more match such that the first match is played between the teams standing first and second; the second match is played between the teams standing third and fourth and so on. The winner of each match secures 2 points and its total points are compared with the points of losing team; the team which secures the maximum points will reach the semi-finals.
 If the points are the same, the team with more run rate will reach the semifinals. Which team will definitely reach the semi-finals?

(1) India (2) England (3) Sri Lanka (4) Australia (5) South Africa

55. It is decided that the teams can carry all the points earned in the league matches to the quarter finals. What will be the sum of the points of all the teams after the quarter finals if two league matches were drawn?

(1) 80 (2) 88 (3) 86 (4) 90 (5) 100

Directions for questions 56 – 60:

The shortest possible road routes among 7 cities A, B, C, D, E, F, G, are represented as follows.

							A
B							98
C						264	166
D					270	120	218
E				246	72	192	94
F			117	129	141	249	211
G		266	149	395	221	341	243

Suppose, the distance between B and E or E and B is 192 km, as shown above.

Answer the following questions on the basis of the above data.

56. If NH5 connects cites A and D, which city should be on NH5?

(1) B (2) C (3) G (4) E (5) F

57. Which city is connected to the maximum number of cities directly, that is, without any other city situated in between them?

(1) A (2) B (3) E (4) G (5) D

58. Which city is connected to the least number of cities?

(1) A (2) F (3) G (4) C (5) D

59. If you want to go from G to D via the shortest path, how many cities you have to cross in between?

(1) 1 (2) 2 (3) 3 (4) 4 (5) 0

_____

_____

60. How many ways are there to reach E from A such that we do not have to go to any city twice?

(1) 1   (2) 2   (3) 3   (4) 4   (5) 5

Directions for questions 61 – 65:

PV and GV are two friends; one day, they went to a place, where they saw two lights red and green flashing at regular intervals. At that time, both PV and GV has an equal number of candies with them. Intelligent PV observed those lights and asked GV to play a game with him. The game was; GV would give a candy to PV, if the red light flashed, and PV would give1 candy to GV, if green flashed and both of them would eat 1 candy each in case the both lights flashed together.

Answer the following questions.

61. If after 1 hour's play, PV had 60 more candies than GV had and the red light flashed 3 times per minute, how many times did both the lights flash together in one hour?

(1) 15   (2) 20   (3) 25   (4) 10   (5) 30

62. If after 1 hour's play, GV was left with half of the candies that he initially had and PV had the same number of candies that he had in the beginning, Which of the following numbers could be the total number of candies that both of them had in the beginning?

(1) 140   (2) 240   (3) 340   (4) 100   (5) 150

63. The red light flashed 3 times per minute, whereas the green light flashed 2 times per minute. If both PV and GV ate 2 candies each in the same time when both the lights flashed, how many more candies would GV have than those with PV?

(1) 50% more than PV   (2) 100% more than PV   (3) 150% more than PV
(4) 200% more than PV   (5) 300% more than PV

64. If red light flashed twice as fast as green light, how many candies they had to eat when both lights flashed together such that PV had less than half of his initial candies and had no candies left?

(1) 1   (2) 2   (3) 3   (4) 4   (5) Data insufficient

65. According to PV's calculations, if they played for 1 hour, PV would 30 candies from G.V without losing any of his candies. But a good man named Deepak, the operator of those lights noticed that PV was cheating. After 30 minutes of their play, he decided to help to GV and stopped the switch of red light immediately. How much minimum time he had to stop the light so the GV did not lose any of his candies to PV in that 1 hour? (It is given that the red light flashed 2 times per minute).

(1) 10 min   (2) 12 min   (3) 15 min   (4) 19 min   (5) 20 min

_____

_____

Directions for questions 66 – 70: A copy of Hyderabad city map is given below:

The number above/below the lines is the route number. For example, route 9 number is from Jeedimetla to Balanagar.

There are many city buses in the city; the bus number is the sum of the route numbers, on which the bus travels. For example, if a bus travels from BHEL to Secunderabad via Kukat Palli and Bala Nagar the bus number will be 8 + 3 + 17 = 28.

Answer the following questions on the basis of the above data.

66. If a bus travels from Jeedimetla to C.B.S with minimum possible bus number, it travels via

    (1) Sanath Nagar   (2) Secunderabad   (3) Kukatpalli

    (4) N.I.M.S   (5) B.H.E.L

67. If a bus numbered '22' starts from B.H.E.L, which of the following can be its destination?

    (1) Kachiguda   (2) Jublee Hills   (3) Koti

    (4) N.I.M.S   (5) None of these

68. Which of the following is not a possible bus number of a bus that travels from Secunderabad to Kukatpalli?

    (1) 24   (2) 37   (3) 20   (4) 22   (5) 19

69. On how many different routes can the buses be run between Balanagar and Mehdipatnam such that the bus number should be less than 50?

    (1) 2   (2) 3   (3) 4   (4) 5   (5) 6

_____

_____

70. How many bus numbers are possible from Secunderabad to Hitech City, such that there are most 4 stops between them? (Each bus stops at every stop).
     (1) 5   (2) 6   (3) 7   (4) 8   (5) 9

Directions for questions 71 – 75:

For Independence Day celebration, Deepak brought some candies to distribute among his favourite students Upasana, Pooja, Tanisha and Ramneet. But they were busy in flag hoisting ceremony; Deepak sir put the candies box on a table and told them to share equally. Immediately after the flag hoisting, Pooja, who is very fond of cadies took her share and 3 candies extra. But none of the other three observed her. After some time Ramnet, an honest girl took exactly one-fourth of the candies, from the box. Then, Upasana took one-third of the remaining candies. Finally, innocent Tanisha, who did not know that all the other three had taken their shares, took exactly one-fourth of the remaining candies as her share, leaving the rest in the box.

Answer the following questions.

71. Which of the students got equal number of candies?
     (1) Upasana and Pooja   (2) Pooja and Tanisha
     (3) Ramneet and Upasana   (4) Poooja and Ramneet
     (5) Upasana and Tanisha

72. What was the least possible number of candies that Deepak could bring?
     (1) 32   (2) 68   (3) 36   (4) 56   (5) 72

73. If the number of candies that Pooja got was equal to the number of candies that both Upasana and Tanisha got together, how many candies did Deepak bring?
     (1) 100   (2) 132   (3) 164   (4) 200   (5) Cannot be determined

74. If Upasana got 18 candies, how many candies did Deepak bring?
     (1) 68   (2) 100   (3) 132   (4) 170   (5) 200

75. If the number of candies left on the table, after all the four girls took their shares, was equal to the number of candies that Pooja got; how many candies did Ramneet get?
     (1) 6   (2) 18   (3) 36   (4) 30   (5) 24

_____

_____

MOCK CAT

ANSWERS

1.	(3)	2.	(4).	3.	(2).	4.	(5)	5.	(1)	6.	(4)	7.	(1)	8.	(3)
9.	(1)	10.	(4)	11.	(3)	12.	(4)	13.	(1)	14.	(5)	15.	(3)	16.	(5)
17.	(1)	18.	(1)	19.	(3)	20.	(5)	21.	(4)	22.	(3)	23.	(5)	24.	(4)
25.	(5)	26.	(2)	27.	(1)	28.	(1)	29.	(2)	30.	(4)	31.	(1)	32.	(2)
33.	(4)	34.	(1)	35.	(2)	36.	(1)	37.	(2)	38.	(1)	39.	(3)	40.	(1)
41.	(2)	42.	(3)	43.	(2)	44.	(3)	45.	(3)	46.	(1)	47.	(5)	48.	(5)
49.	(1)	50.	(3)	51.	(3)	52.	(3)	53.	(4)	54.	(2)	55.	(2)	56.	(1)
57.	(3)	58.	(3)	59.	(2)	60.	(3)	61.	(5)	62.	(2)	63.	(4)	64.	(4)
65.	(3)	66.	(3)	67.	(3)	68.	(5)	69.	(2)	70.	(3)	71.	(3)	72.	(3)
73.	(2)	74.	(2)	75.	(5)										

EXPLANATIONS

SECTION – I

1. A hint can be taken from the concluding lines of the passage. 'We' refers to whom? This implies that somebody who offers goods and services is a mutual group; this word is 'professional' and has been introduced in (3) and (5). 'True' professionals are not related to the idea, hence (3) is the answer.

2. Option (1) makes no sense, and option (2) and (5) are irrelevant, hence eliminated. Option (3) is not justified in the passage. Therefore by PoE, (4) is the answer.

3. We need to choose an option that justifies as to why science as no effect on the ethical option (3) and (5) are not related to the passage (or) its contexts; hence it is eliminated as well. (4) is eliminated on the same ground. **Answer: (2)**

4. Going by PoE we can deduct the answer, (1) is eliminated as we do not know if 'very close' justifies the distance of mercury and sun. (3) and (4) are not related to the concept being discussed here, hence, eliminated. (5) can be inferred as the next sentence supports the expression 'Jupiter like distance'. **Answer: (5)**

5. The preceding sentence distinguishes free education from slavery. It knows distinguishes scholarly learning from 'abstract concepts by the hoi polloi' or 'trivialities'. **Answer: (1)**

6. (B) is an awkward and a meaningless sentence, using continuous 'forgetting' with indefinitive 'relaxed'. (D) is incorrect as the parallelism in the sentence has not been maintained. 'Ing' form with 'convey' was required to have a correct structure of the sentence. **Answer: (4)**

7. Apostrophe 's' with 'it' has been incorrectly used in (B). Similarly 'sceneries' is a syntax error as the plural for scenery does not exist. **Answer: (1)**

_____

_____

8. 'With' is used for a person and 'by' is used for an object. Therefore, (A) is incorrect. (B) is incorrect due to a syntax error. One sits 'beside' the other; 'besides' refers to 'other than'. (C) has no error. (D) has a subject verb disagreement; ('was far less important' should replace 'were far less important'). Hence, it is also incorrect. **Answer: (3)**

9. 'Right on track' should be the correct phrase; therefore, (A) is incorrect. 'One of those' should be followed by a plural verb 'have' and not 'has'; therefore (B) is also incorrect. (C) and (D) are correct. **Answer: (1)**

10. (A) makes a faulty comparison of system to America. (B) uses 'after even' incorrectly. (C) is incorrect, using the plural 'they' for the singular 'IMF'. "Lay" should replace 'laid' in D. **Answer: (4)**

11. In this sentence, we need a word that would compliment integration. 'gross', 'universal' and 'wholesome' integration does not make sense. 'Botched' is not related. 'Seamless' tells us that the integration is without a gap or joint. **Answer: (3)**

12. The second sentence hints that the 'word' is being used in harmony with other tools, so the only options to consider are (2) and (4). Again, (4) is a better option as it signifies the synchronisation of ideas. **Answer: (4)**

13. The word on look out should be related to 'collecting', so, (3), (4) and (5) are all eliminated. Scouring means to 'search', but scraping relates to collect something with labour and hard work; hence, (1) is the answer. **Answer: (1)**

14. Skills are developed and reinforced after what? Synchronisation/adjustment is the word we are looking for, (1), (2), (3) and (4) refer to changes, only (5) refers to planning/adjustment for precise results. **Answer: (5)**

15. The physical universe is an exact 'rendition/replica' of the whole infinite universe. Hence, (3).

16. (1), (2) and (4) can be easily ruled out. Though Marx's sociological ideas of literature might be considered revolutionary (the profound influence of Hegel notwithstanding) as they presented a new perspective and later became the basis of the proletariat revolutions, but these can hardly be conceptualized from the passage and are rather based on our prior knowledge. The right answer is thus (5) as it deals with the theme of the passage. **Answer: (5)**

17. Para 2, line 2 mentions the phrase used in the question stem and go on to elaborate the reasons, which are best summarized in (1). **Answer: (1)**

_____

_____

18. The answer is best summed up in the last sentence of para 2: "Marxian sociological … social consciousness". This answer is available only in (1). **Answer: (1)**

19. (1) Incorrect ,as Marx and Engles never propounded the deterministic view of art and literature.
     (2) It is not the social life that constitutes economic structure. It is the other way round.
     (4) and (5) may not be incorrect, but do not reflect the central idea. **Answer: (3)**

20. (5). In the given phrase, art and literature represent consciousness. These do not create life but are its creation. (1) and (4) can be easily ruled out. (2) is rendered incorrect by the latter part of the sentence. The real choice is between (3) and (5). Here too economic needs do not 'create' art and literature. **Answer: (5)**

21. (1) 'Warlike attitude' though mentioned in the passage, does not define heroism.
     (2) Heroic deeds need not be 'intellectual'. Moreover, the phrase 'He finds a rare divine spark in him' in the third paragraph renders the answer incorrect.
     (3) Heroism is not transcendental.
     (4) The second last line of para 2 mentions 'self-trust and inner strength of the soul' among the qualities of a hero. The third para mentions that 'He finds a rare divine spark in him', and again that '(it) follows the dictates of conscience and to become unanswerable to any external agency'.
     (5) Heroic deeds need not be 'impulsive'.   **Answer: (4)**

22. Although all the statements are extracted from the passage, the central idea is best stated in (3). (1) becomes restrictive because of the warlike attitude. (2) talks about the self trust and the fighting spirit, along with the suffering, but not about 'altruism'. Fight for 'self' need not mean heroism, as defined in the passage. (4) and (5) are also similarly restrictive. **Answer: (3)**

23. (1) The phrase 'classical and renaissance literature' makes the option restrictive.
     (2) The passage enumerates and does not 'propound'.
     (3) Restrictive
     (4) 'The effects' are not the main focus.
     (5) The statement represents the gist of the passage.   **Answer: (5)**

24. Heroism is not about 'reason' and academic 'pursuits' (I). Neither is it 'an expression of pride and war-like persistence' (II). **Answer: (4)**

25. (5) The tone of the passage is positive, as can be made out from the concluding statement. So adulatory is the right answer as the author eulogizes the heroic traits in a man. **Answer: (5)**

_____

_____

SECTION – II

26. **Answer: (2)**

27. **Answer: (1)**

28. $P = 7^{3n} - 3^{5n} = 343^n - 243^n$

We have, $a^n - b^n$ is divisible by $(a - b)$ for all positive integral values of n.

So, P divisible by $343 - 243 - 100$.

Therefore, option (1) correct.

29. $\log_{30}30 = \log_{30} = 3 \times 3 \times h = 1$.

$\Rightarrow \log_{30}3 + \log_{30}5 + \log_{30}2 = 1$

$b + a + \log_{30}2 = 1$

$\log_{30}2 = 1 - a - b$

$\log_8 30 = \dfrac{1}{\log_{30} 8} = \dfrac{1}{3\log_{30} 2} = \dfrac{1}{3(1 - a - b)}$ **Answer: (2)**

30. $N = 1000^8 - 8 = 10^{24} - 8$

N = Number with twenty three 9s, followed by 2.

That is, N = 9999 ……….. 92

The sum of digits = $(23 \times 9) + 2 = 207 + 2 = 209$.   **Answer: (4)**

31. $\displaystyle\sum_{n=1}^{3000} n^5 = 1^5 + 2^5 + 2^5 + 3^5 + \ldots\ldots.. + 3000^5$

$= \underset{A}{\underbrace{(1^5 + 3^5 + 5^5 + 7^5 + 7^5 + \ldots\ldots.. 2999^5)}} + \underset{B}{\underbrace{(2^5 + 4^5 + \ldots\ldots.. + 3000^5)}}$

B is perfectly divisible by 4.

When A divided by 4, the remainders will be

$= 1 - 1 + 1 - 1 + \ldots\ldots..\ 1500^{th}$ term $= 0$.

So, when $\displaystyle\sum_{n=1}^{3000} n^5$ is divided by 4, zero is the remainder.   **Answer: (1)**

32. ABCD is a square of area 64 cm². Therefore, $a^2 = 64 \Rightarrow a = 8$ cm

$\Delta PDC \cong \Delta QBC$ (ASA)

$\Rightarrow PC = CQ$ and $PD = BQ$

Now, $ar(\Delta PCQ) = \dfrac{1}{2} \times PC \times CQ = 50$ cm

$(PC)^2 = 100 \Rightarrow PC = 10$ cm

In ΔBCQ,

$BQ = \sqrt{CQ^2 - BC^2} = \sqrt{(10)^2 - (8)^2} = \sqrt{36} = 6$ cm   **Answer: (2)**

_____

_____
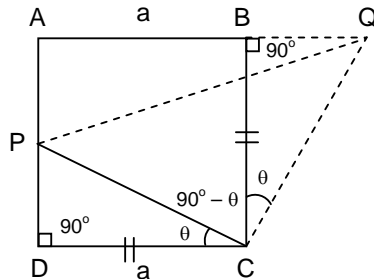
33. We know AM $\geq$ GM

So, $\dfrac{\dfrac{p}{q}+\dfrac{q}{r}+\dfrac{r}{s}+\dfrac{s}{p}}{4} \geq \left(\dfrac{p}{q}\times\dfrac{q}{r}\times\dfrac{r}{s}\times\dfrac{s}{p}\right)^{1/4} \Rightarrow \dfrac{p}{q}+\dfrac{q}{r}+\dfrac{r}{s}+\dfrac{s}{p}\geq 4$ **Answer: (4)**

34. $P = m^4 - 20m^2 + 4 = m^4 - 4m^2 + 4 - 16m^2$

    $= (m^2 - 4)^2 - (4m)^2 \Rightarrow (m^2 - 4 - 4m)\ (m^2 - 4 + 4m)$

    So, P has at least two factors for any integral value of m, and also, for any value of m, any factor will not

    be equal to 1.

    Hence, there is no value of m for which $m^4 - 20m^2 + 4$ is a prime number.   **Answer: (1)**

Sol. 35 – 36

Ludhiana $t_1 = 10$ hrs   A   B   Jalandhar

(10x + y)

(10y + x)

$t_2 = 12$ hrs
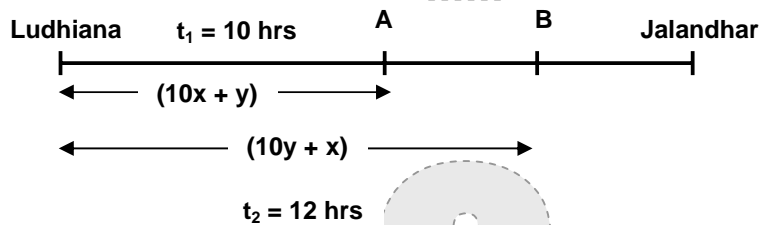
From the above figure, we get

$V = \dfrac{(10x + y)}{10} = \dfrac{10y + x}{12}$

Solving, 5x = 4y

So, x = 4, y = 5

He covered $10 \times 5 + 4 = 54$ km up to the second milestone and his speed was $\dfrac{45}{10} = 4.5$ km/hr.

35. **Answer: (2)**

36. **Answer: (1)**

37. Relative speed = (58 – 40) km/hr = 18 km/hr

    $= 18 \times \dfrac{5}{18}$ m/sec = 5 m/sec.

    So, 15 seconds before the collision, they will be $15 \times 5 = 75$ m apart.   **Answer: (2)**

38. We have, $\dfrac{(P-1)! - 1}{P}$ = remainder will give 0

    That is, (P – 1)! + 1 = PK (Here, K is a natural number.)

    (P – 1)! = PK – 1 = P(K – 1) + P – 1

    $\Rightarrow$ (P – 1) (P – 2)! = P(K – 1) + P – 1

_____

_____

$\Rightarrow (P - 2)! = \dfrac{P(K - 1)}{P - 1} + 1$ (Since $(P - 2)!$ is an integer.)

But P is a prime number.

$\therefore$ $(K - 1)$ must be divisible by $P - 1$.

$\therefore$ We have $(P - 2)! = PK + 1$.

So, the remainder when $(P - 2)!$ is divided by P is 1.

Therefore, option (1) is correct.

39.   CF and CD are the tangents drawn to the circle from C.

      So, CF = CD

      If $\angle C = 30^o$, $\angle DFC = 75^o$

      So, $\angle DFC = \angle DEF = 75^o$ (Angles in alternative segments.)

      Answer: (3)
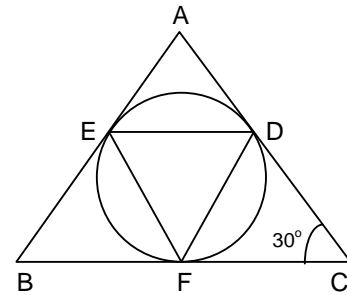
40. $\log_k x = 6, \Rightarrow x = k^6$

      $\text{Log}_{25k}8x = \log_{25k}8k^6 = 3 \Rightarrow 8k^6 = (25 - k)^3$

      $k^3 = \left(\dfrac{25}{2}\right)^3 \Rightarrow k = 12.5$ **Answer: (1)**

41.   Initial volume of the container = $3x + 2x = 5x$

      New volume of the container = $5x + 10$.

      If final concentration of milk = 50%,

$$\dfrac{3x}{5x + 10} = \dfrac{1}{2} \qquad \Rightarrow x = 10$$

      And if final concentration of milk = 40% $= \dfrac{2}{5}$,

      $\dfrac{3x}{5x + 10} = \dfrac{2}{5} \qquad \Rightarrow 15x = 10x + 20$

      $x = 4$

      Volume $V = 5 \times 4 = 20$ litres

      $\Rightarrow 20 \le V \le 50$ **Answer: (2)**

42.

_____
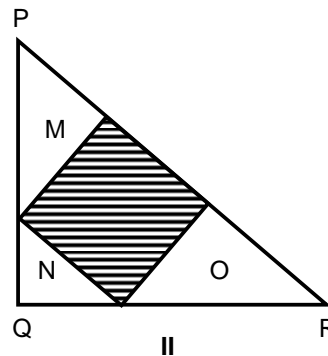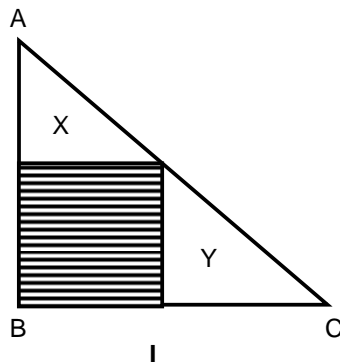
Triangles X, Y, M, N and O are similar as they are part of the same triangle. Hence, the ratio of their areas is

$\dfrac{X}{M} = \dfrac{U}{V} = \dfrac{441}{440}$

Also, P + U + 441 = Q + V + A + 440

So, ar(Δ ABC) = 441(N)

Thus, sides of triangle N are $\dfrac{1}{21}$ × side of ΔPQR.

Hence, hypotenuse of the whole triangle = $(440)^{1/2}$ × 21.

If its height from the side is h, h − $\dfrac{h}{21}$ = $(440)^{1/2}$.

So, if two shorter sides have lengths a, b, we have

ab = $\dfrac{\left[(440)^{1/2} \times 21\right]^2}{20}$ = 22 × 21^2 and $a^2 + b^2 = 440 \times 21^2$

$(a + b)^2 = (21)^2 (440 + 2 \times 22) = 21^2 \times 22^2$

a + b = 21 × 22 = 462   **Answer: (3)**

43. Let, boys are x% and girls (100 − x) % of the total number of previous year students.

The increase in the number of students = 20%.

10% of x% + 35% of (100 − x)% = 200% of 100% $\Rightarrow$ x = 60

Hence, the percentage of girls = $\dfrac{(100 - 60) \times 1.35}{100 \times 1.20}$ × 100 = 45%. **Answer: (2)**

44. 97 is the prime number nearest to 100.

So, we check the highest power of 97 is 10000!

$\dfrac{10000}{97}$ = 103 + $\left\lceil \dfrac{103}{97} \right\rceil$ = 104.

But the highest power of 2 in 100! = 97 and if we raise 2^{97} to the power 104, we get the power of 2 greater than 10,000, which is not possible.

$\Rightarrow$ Therefore, 103 is the correct answer.   **Answer: (3)**

45. Let the second cube has x faces painted red and y faces painted blue.

$\Rightarrow$ The probability of both the cubes coming up with the same colour = $\dfrac{5x + 1y}{6 \times 6}$ = $\dfrac{1}{2}$ …….(1)

Also, x + y = 6   ……… (2)

Solving x = y = 3

So, 3 faces of the second cube painted red.   **Answer: (3)**

_____

_____

46. $5a - 2b = 60\%$ of $150 = 90$.

$b = \dfrac{a}{2} + 2a - 45$.

Since (a, b) are integers and $a + b \le 30$, we get the only possible pairs as (18, 0) and (20, 5).

Answer: (1)

47. **Case I:** All 300 correct. Score = 150

The next highest = 143 (150 – 7) {29 correct and 1 wrong answer}

So, all the number of the farm 7N + 3, from 1 to 150 can be derived in this case.

Similarly, all numbers of the form below can be

Numbers left in each case

(a) 7N from 1 to 140 (28 attempt) 1

(b) 7N + 1 from 1 to 120 (24 attempt) 4

(c) 7N + 2 from 1 to 135 (27 attempts) 2

(d) 7N + 3 from 1 to 150 (all 30 attempt) 0

(e) 7N + 4 from 1 to 130 (26 attempt) 2

(f) 7N + 5 from 1 to 145 (29 attempt) 0

(g) 7N + 6 from 1 to 125 (25 attempt) 3

Hence, the total number of values that can never be obtained is 1 + 4 + 2 + 0 + 2 + 0 + 3 = 12.

Answer: (5)

48. Discriminant = $[2a(b + c)]^2 = 4(a^2 + b^2)(a^2 + c^2)$

$= -4(a^2 - bc)^2 < 0$

As x is real, this must be 0.

$\therefore a^2 = bc$　　　**Answer: (5)**

49. We have to find max $(a.b^2.c^3) = $ max $(a.b.b.c.c.c)$

So, write can write the equation again as

$a + b + c = 6$

$\Rightarrow a + \dfrac{b}{2} + \dfrac{b}{2} + \dfrac{c}{3} + \dfrac{c}{3} + \dfrac{c}{3} = 6$

Max $\left(a \cdot \dfrac{b}{2} \cdot \dfrac{b}{2} \cdot \dfrac{c}{3} \cdot \dfrac{c}{3} \cdot \dfrac{c}{3}\right) = (1)^6$　　　[As the maximum product when digits are equal]

$\Rightarrow$ Max $\dfrac{(a.b^2 \times c^3)}{2^2 \times 3^3} = 1$

Max $(a.b^2.c^3) = 2^2 \times 3^3 = 4 \times 27 = 108$　**Answer: (1)**

_____

_____

50. The dart can be hit only in the shaded area.

So, favorable changes = shaded area
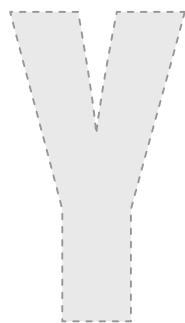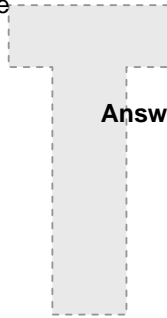
$$= 4 \times \text{Area of 1 quarter circle}$$

$$= 4 \times \frac{1}{4}\pi r^2 = \pi \times (1)^2 = \pi$$

Total chances = the area of rectangle

$$= 10 \times 8 = 88$$

$$\text{Probability} = \frac{\pi}{80} = \frac{22}{7 \times 80} = \frac{11}{280} .$$ **Answer: (3)**

_____

_____

SECTION – III

Solutions 51 – 55:

Since 8 teams reached quarterfinals, every team played 6 matches in the quarterfinals.

Since India lost to Australia and still managed to get 12 points after the quarter finals, so it won all the other quarter-finals along with the match played against Sri Lanka in the league round.

Similarly, Australia lost to both England and New Zealand and still got 10 points. So, it won the league match played against South Africa and all other quarter-finals.

South Africa lost to Australia in league match and to India in quarter-finals.

So, it won all other quarter-finals to get 10 points.

So, we can conclude:

India lost to Australia only.

Australia lost to England and New Zealand only.

South Africa lost to India in Q.F. and to Australia in League.

Sri Lanka lost to India in league to Australia and, South Africa in Q.F.

Pakistan defeated West Indies in league and both New Zealand and England in Q.F.

New Zealand defeated Australia in Q.F. and had a match drawn with West Indies.

England defeated West Indies and Australia in Q.F.

West Indies had a match drawn with New Zealand.

So, the following table can be formed.

|	India	Sri Lanka	Pakistan	West Indies	Australia	South Africa	New Zealand	England
India	–	India(L)	India	India	Australia	India	India	India
Sri Lanka		–	Sri Lanka	Sri Lanka	Australia	South Africa	Sri Lanka	Sri Lanka
Pakistan			–	Pakistan(L)	Australia	South Africa	Pakistan	Pakistan
West Indies				–	Australia	South Africa	Draw	England
Australia					–	Australia(L)	New Zealand	England
South Africa						–	South Africa	South Africa
New Zealand							–	New Zealand(L)
England								–

*(L) – League match

51.   **Answer: (3)**

52.   **Answer: (3)**

_____

_____

53.   **Answer: (4)**

54.   The first match will be played between India and Australia/South Africa, the second between South Africa/Australia and Sri Lanka, the third between Pakistan and New Zealand and the fourth match will be played between England and West Indies. From the result of the first three matches, we cannot conclude which team would reach the semifinals. But even if West Indies wins the fourth match, it will secure 1 + 2 = 3 points, whereas England already has 4 points. Hence, England would definitely reach semifinals. **Answer: (2)**

55.   Since no two matches were drawn in the league round, the top two teams should earn 6 and 4 points respectively. So, the total points from league round will be 4 (6 + 4) = 40 and in quarter finals, total matches were 24 and so total points of all the teams in quarter finals will be 24 × 2 = 48.
So, after quarter finals, the sum of total points is 40 + 48 = 88. **Answer: (2)**

Solutions 56 – 60:

From the diagram given below, it is clear that 72 is the least distance, that is, from C to E. So, C and E are connected directly.
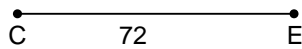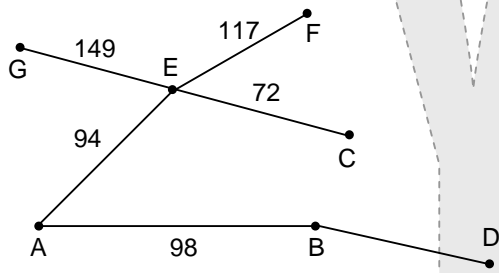

The nearest city from A is E, since A to E is 94 and A to B is 98. So, A – E and A – B are also connected directly.
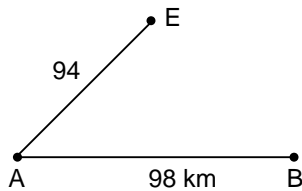
Now, D is nearest to B, that is, 120. So, B and D are connected directly.

Similarly, F and G are nearest to E.

Therefore, EF and EG are also connected directly. So, we can draw the following map.

Now, check each distance.

AB = 98 = directly connected – OK

AC = 166 = AE + EC = 94 + 72 = 166 – Satisfied

AD = 218 = 98 + 120 = AB + BD – OK

AE = 94 – direct route

_____

_____

AF = 211 = AE + EF = 94 + 117

AG = 243 = AE + EG = 94 + 149

BC = 264 = BA + AE + EC = 98 + 94 + 72

BD = 120 – direct

BE = 192 = BA + AE = 98 + 94

BF = 249, the only possible route is BA + AE + EF = 98 + 94 + 117 $\neq$ 249.

So, there might be some other route from B to F. We will find the route BF later.

Come to BG.

BG = 341 = BA + AE + EG = 98 + 94 + 149 = 341.

CD = 270 $\neq$ CE + EA + AD

So, there is other route for CD.

CE = 72 – direct

CF = 141 $\neq$ CE + EF, there is other route for C and F.

Similarly, DE, DF and DG have some others routes.

In all these D is common. So, there should be some other route from D.

But observe F is next nearest to D after E. So, DF should be directly connected.

Then DE = 246 = DF = EF = 129 + 117.
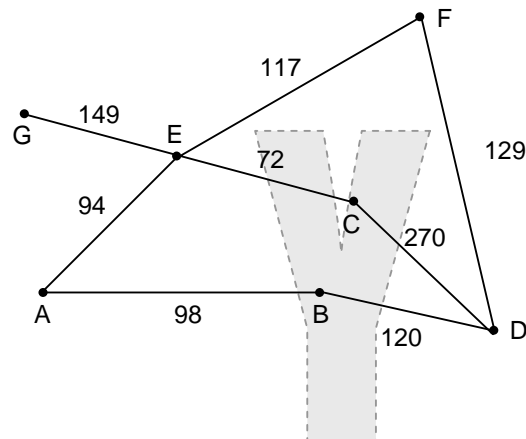
Now come to BF.

BF = 249 = BD + DF = 120 + 129.

Now take CD.

CD = 270 $\neq$ CE + EF + FD

Therefore, CD has some other route and no combination is satisfying.

Therefore, CD should be directly connected.

Now, the map will be

56.   **Answer: (1)**

57.   **Answer: (3)**

58.   **Answer: (3)**

59.   G to D is shortest path is G – E – F – D.   **Answer: (2)**

_____

_____

60. A to E direct,

    A B C D E

    A B D E F

    Total – 3 ways.   **Answer: (3)**

Solutions 61 – 65:

61. PV had 60 more candies than GV, means, GV lost 30 of his candies to PV.

    That means, in 1 hour, the red light flashed 30 times more than the green light and it is given that red light flashed 3 times per min. i.e. 180 times an hour. So, green light flashed 150 times per hour, i.e., 5 times in 2 min.

    So, both the lights flashed together for every two minutes, i.e., 30 times in one hour. **Answer: (5)**

62. GV was left with half of his candies, and PV had the same number as he had in the beginning, means, GV lost one-fourth of his candies to PV (assume x) and the same number of candies i.e. x candies, they ate but if we take 140.

    Initially – PV had 70 and GV had 70.

    $\frac{1}{4}$ th of 70 is not an integer, so he could not lose, $\frac{70}{4}$ = 17.5 candies to PV.

    Similarly, all the answers except 240 can be eliminated.   **Answer: (2)**

63. Red light flashes 3 times a min. and green 2 times a min.

    So, in every min. PV loose 2 candies and get 3 from GV and eat 2.

    So he will loose 1 candy, each min.

    Where as GV loose 3, get 2 and eat 2, so total 3.

    If they want to finish their candies at the same time, GV should have 3 times the candies of PV.

    i.e., 200% more candies than PV.   **Answer: (4)**

64. Red light flashed twice as fast as the green light.

    So, one time only red flashed and then both red and green lights flashed together, but only green light never flashed. So, PV never lost his candies to GV. If they ate 1 candy, each time both lights flashed, PV would eat the candy, which he got from GV, so he would have all of his candies, by the time, GV completed all his candies.

    Similarly, if they ate 2 candies each, PV would get 1 from GV and eat 2, means, he would lose 1 of his own candies. At the same time, GV would lose 1 and eat 2, means, he would lose 3.

    So, if GV completed all his candies, PV would lose only one-third of the candies. If they ate 3 candies, PV would eat 2 of his own candies and GV would lose 1 to PV and eat 3. So, it makes total 4.

    By the time, GV completed his candies; PV would be left with exactly half of his candies.

    But he had to left with half of his candies, so they would eat atleast 4 candies, when both lights flashed together.   **Answer: (4)**

_____

_____

65. Red light flashed 2 times per min. and PV ate 30 of GV's candies, without losing any of his candies, If green light flashed 3 times in 2 Minutes, then only, for every 2 min, PV would get 1 candy from GV. So in 1 hour, he would get 30 and eat those 30 candies, because both lights also flashed together 30 times in 1 hour.

So in 30 min, when Deepak noticed PV's cheating, GV would already lose 15 candies to PV.

So, he had to earn back his 15 candies.

If Deepak stopped the red light for 'x' min, only green would flash, i.e., 3 times in 2 min.

So, GV would get 3 candies in 2 minutes from PV.

So in x min he would get $\dfrac{3x}{2}$ candies.

But again, after the red light was on, he would lose 1 candy in 2 min. i.e. for (30 – x) min.

So, he would lose $\dfrac{30-x}{2}$ candies.

$\therefore \dfrac{3x}{2} - \dfrac{(30-x)}{2} = 15$.

$\Rightarrow x = 15$.

So, for 15 min, the red light was so that GV did not his candies to the cheater PV.　　**Answer: (3)**

Solutions 66 – 70:

66. By observation, the bus, which goes from Jeedimetla to CBS can have minimum possible number, if it goes via Bala Nagar, Kukatpalli, S.R Nagar, Ameerpet, Nampally, and Koti.　　**Answer: (3)**

67. It is better to go with the options.

Choice (1) → BHEL to Kachiguda cannot be 24, because Nampally to Kachiguda itself is 28.

Choice (2) → Jublee hills – it is not possible.

Choice (3) → Koti

BHEL – Kukatpalli – SR Nagar – Ameerpet – Nampally – Koti is 8 + 5 + 1 + 6 + 2 = 22.

Answer: (3)

68. Secunderabad to Kukatpalli.

Via Balanagar, Sanath Nagar, SR Nagar

= 17 + 4 + 1 + 5 = 19.　　**Answer: (5)**

69. Balanagar to Mehdipatnam, bus number 50.

Different possibilities are:

Balanagar – Kukatpalli – BHEL – Hitechcity – Mehdipatnam

Balanagar – Kukatpalli – SR Nagar – Ameerpet – NIMS – Mehdipatnam

Balanagar – Kukatpalli – SR Nagar – Ameerpet – Nampally – Koti – Jubleehills – Mehdipatnam

So, total 3 ways. **Answer: (2)**

_____

_____

70. Secunderabad to hitechcity with less than or equal to 4 stops can be via

    1. Ameerpet and N.I.M.S.

    2. Nampally, Ameerpet and N.I.M.S.

    3. Nampally, Koti, Jubleehills and Mehdipatnam

    4. Ameerpet, N.I.M.S and Mehdipatnam

    5. Nampally, Ameerpet, N.I.M.S and Mehdipatnam

    6. Ameerpet, SR Nagar, Kuktapalli and B.H.E.L.

    7. Balanagar, Kukatpalli and B.H.E.L.

    So, total 7 routes. **Answer: (3)**

Solutions 71 – 75:

Let the total number of candies that Deepak sir brought be 'x'.

So, Pooja took $\dfrac{x}{4} + 3$

The remaining candies = $\dfrac{3x}{4} - 3$

Remneet took $\dfrac{3x}{16} - \dfrac{3}{4}$

The remaining candies = $\dfrac{9x}{16} - \dfrac{9}{4}$

Now, Upasan took $\dfrac{1}{3}$ rd, i.e. $\dfrac{3x}{16} - \dfrac{3}{4}$

The remaining candies = $\dfrac{6x}{16} - \dfrac{6}{4}$

So, Tanisha took $\dfrac{6x}{64} - \dfrac{6}{16}$.

Tthe following table can be formed.

Name of student	Number of candies
Pooja	$\dfrac{x}{4} + 3 = \dfrac{x+12}{4}$
Ramneet	$\dfrac{3x}{16} - \dfrac{3}{4} = \dfrac{3x-12}{16}$
Upasana	$\dfrac{3x}{16} - \dfrac{3}{4} = \dfrac{3x-12}{16}$
Tanisha	$\dfrac{6x}{64} - \dfrac{6}{16} = \dfrac{3x-12}{32}$

71. **Answer: (3)**

_____

_____ Page :

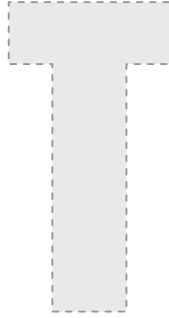72. If we take x = 32, Ramneet's share = $\dfrac{3 \times 32 - 12}{16}$, which is not an integer.

The 'x' value should be such that all $\dfrac{x+2}{4}$, $\dfrac{3x-12}{16}$ and $\dfrac{3x-12}{32}$ should be integers.

So, the minimum value of 'x' is 36.   **Answer: (3)**

73. $\dfrac{x+2}{4} = \dfrac{3x-12}{16} + \dfrac{3x-12}{32}$

∴ 8x + 96 = 6x − 24 + 3x − 12

⇒ x = 132.   **Answer: (2)**

74. $\dfrac{3x-12}{16}$ = 18, ⇒ x = 100

Answer: (2)

75. Number of candies left = 3 times of Tanisha's share

$\dfrac{9x-36}{32} = \dfrac{x+12}{4}$

⇒ x = 132

So, Ramneet got $\dfrac{3x-12}{16} = \dfrac{384}{16}$ = 24.   **Answer: (5)**