IMPORTANT INSTRUCTIONS

- The maximum marks are **300.** Time allotted is **90 MINTUES.**
- There are three sections in the question paper having total **75 questions:**
  - Section – A : Maths (25 Questions)
  - Section – B : Science (25 Questions)
  - Section – C : Aptitude (25 Questions)
- Each question carries **4 marks** each
- **Negative Marking**: **1/4 (one-fourth) marks** will be deducted for every incorrect answer.
- **Use only BLUE/BLACK pen to fill the circles in bubble sheet.**
- Use of pencil is strictly **not allowed.**
- **Do not use marker or white fluid** to hide the mark

Section – I
Mathematics

1. The ascending order of the surds $\sqrt[3]{2}$, $\sqrt[6]{3}$, $\sqrt[9]{4}$, is _____.

(a) $\sqrt[9]{4}$, $\sqrt[6]{3}$, $\sqrt[3]{2}$ (b) $\sqrt[9]{4}$, $\sqrt[3]{2}$, $\sqrt[6]{3}$ (c) $\sqrt[3]{2}$, $\sqrt[6]{3}$, $\sqrt[9]{4}$ (d) $\sqrt[6]{3}$, $\sqrt[9]{4}$, $\sqrt[3]{2}$

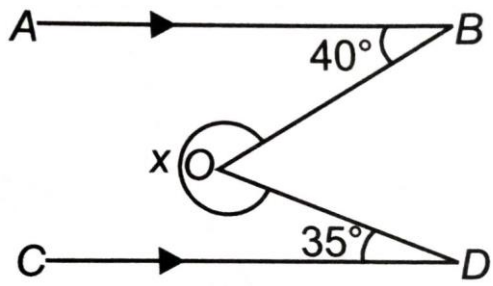
2. The value of x, if $5^{2x-1} = 25^{x-1} + 100$ is _____

(a) 8 (b) 5 (c) 2 (d) 0

3. How many linear equation is x *and* y can be satisfied by $x = 5$ and $= 7$?

(a) Only one (b) Infinitely many (c) Only two (d) None of these

4. In the given figure AB ∥ CD. Find the value of x.

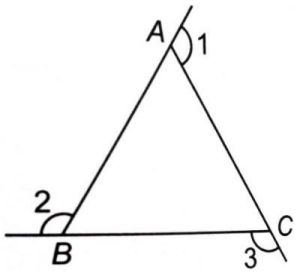


(a) 189° (b) 215° (c) 285° (d) 280°

5. In the given figure, if AB = 7.5 cm, BC = 5 cm and CA = 6.3 cm. Then external angles in ascending order are

(a) ∠1 < ∠2 < ∠3 (b) ∠2 < ∠1 < ∠3

(c) ∠3 < ∠2 < ∠1 (d) ∠3 < ∠1 < ∠2



6. The area of a triangle, two sides of which are 8 cm and 11cm and the perimeter is 32 cm is $k\sqrt{30}$ cm^2. Find the value of k.

(a) 8 (b) 6 (c) 7 (d) 9

7. The difference between the maximum and the minimum observation in the data is called _____.

(a) Frequency (b) Class interval (c) Cumulative frequency (d) Range

8. If $x = k^2$ and y = k is a solution of $x - 5y + 6 = 0$ then find the value of k

(a) 1,2 (b) 2,3 (c) 1,5 (d) 2, 4

9. Express $23.\overline{43}$ in the rational form.

(a) $\frac{2320}{99}$ (b) $\frac{1}{9}$ (c) $\frac{14}{85}$ (d) $\frac{2310}{87}$

10. If the graph of the equation $3x + 5y = 15$ cuts the coordinate axes at P and Q, then hypotenuse of right triangle POQ is of length _____.

(a) $\sqrt{17}$ units (b) 5 units (c) $\sqrt{34}$ units (d) 4 units

11. The following observations have been arranged in the ascending order. If the median of the data 2 , 3, x, x + 2, 11, 17 is 9, then the value of $3x + 1$ is _____.

(a) 20 (b) 8 (c) 12 (d) 25

12. $\frac{7\sqrt{3}}{(\sqrt{10}+\sqrt{3})} - \frac{2\sqrt{5}}{(\sqrt{6}+\sqrt{5})} - \frac{3\sqrt{2}}{(\sqrt{15}+3\sqrt{2})}$ = _____.

(a) 2 (b) 1 (c) $\frac{1}{2}$ (d) 3

13. The sum of three consecutive even numbers is 222. Find the numbers.

(a) 73, 74, 75 (b) 74, 74, 74 (c) 72, 74, 76 (d) 74, 76, 78

14. Equation of a line which is 5 units distance above the x-axis

(a) $x - y = 0$ (b) $x + 5 = y$ (c) $x - 5$ (d) $y - 5$

15. 65% of 400 + $\sqrt{?}$ = 44% of 800 – 12% of 400

(a) 1936 (b) 44 (c) 2115 (d) 46

16. Division of a natural number by another natural number gives

(a) always a natural number (b) always an integer

(c) always a rational number (d) always an irrational number

17. The value of $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$ is

(a) 6 (b) 8 (c) 10 (d) 4

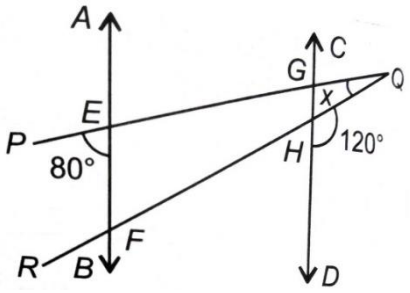
18. If $x = 1 - \sqrt{2}$, then find the value of $\left(x - \frac{1}{x}\right)^2$

(a) 2 (b) 3 (c) 5 (d) 4

19. The value of $'x'$ in the ordered pair $(x, -8)$ if the ordinate of the pair is 4 more than the absecissa is _____.

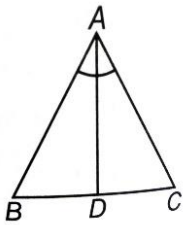
(a) – 4 (b) – 12 (c) – 8 (d) 4

20. In the given figure AB ‖ CD and PQ, QR intersects AB and CD both at E, F and G, H respectively. Find the value of x.



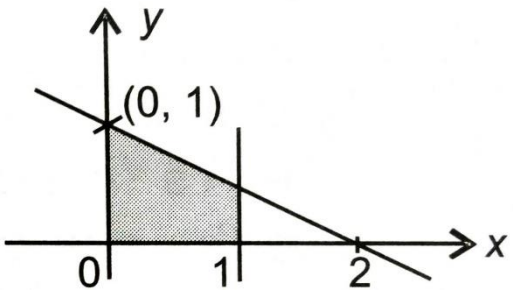
(a) 40° (b) 20° (c) 100° (d) 30°

21. If AD is bisector of ∠A and it is perpendicular to BC. Then ΔABC is _____triangle.



(a) Isosceles (b) Equilateral (c) Scalene (d) None of these

22. In the given rectangular coordinate system, the shaded region is bounded by two straight lines. Which of the following is not an equation of one of the boundary lines?

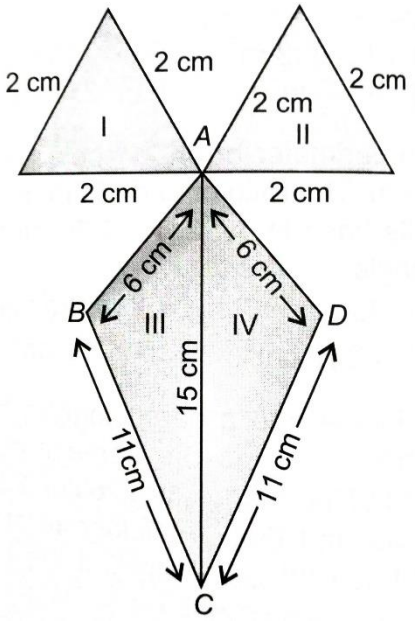


(a) x = 0 (b) x = 1 (c) x – y = 0 (d) x + 2y = 2

23. The Probability that a red marble selected at random from a jar containing x red, y blue and z green

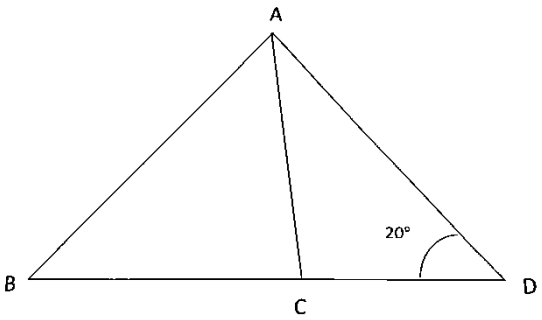
(a) $\frac{Y}{X+Y+Z}$ (b) $\frac{X+Z}{X+Y+Z}$ (c) $\frac{X}{X+Y+Z}$ (d) $\frac{Y+Z}{X+Y+Z}$

24. Tanya joined four triangles of cardboard to create a mask of joker as shown in the given figure. Find the total area of the mask. [Given $\sqrt{2}$= 1.41, $\sqrt{3}$ = 1.73]



(a) 60.02 cm^2 (b) 50 cm^2 (c) 59 cm^2 (d) 53 cm^2

25. Consider ΔABD such that $\angle ADB = 20^\circ$ and C is a point on BD such that AB = AC and CD = CA, then the measure of $\angle ABC$ is



(a) 40° (b) 45° (c) 20° (d) 60°

Section – II
SCIENCE

26. The formula of silver chromate is:
(a) $Ag_2Cr_2O_7$ (b) Ag_2CrO_4 (c) $AgCrO_4$ (d) $Ag_2(CrO_4)_3$

27. The chemical symbols of which pair of elements among the following begin with different letters?
(a) Platinum, phosphorus (b) Barium, bromine
(c) Potassium, platinum (d) Calcium, cadmium

28. The formula of nitride of calcium is
(a) CaN (b) $Ca(NO_2)_2$ (c) Ca_3N_2 (d) Ca_2N_3

29. Mass of one atom of chlorine is
(a) $\frac{1}{6.022\times10^{23}}$ g (b) $\frac{71}{6.022\times10^{23}}$ g (c) $\frac{35.5}{6.022\times10^{23}}$ g (d) 71 u

30. Autophagy involves the digestion of
(a) Own cells organelles (b) Organic food stuff
(c) Engulfed food material (d) Food captured by a cell with own effort

31. Which of these cell organelles contain their own genetic material?
(a) Ribosomes (b) Mitochondria (c) Chloroplast (d) Both b and c

32. The chief role of nucleolus in a nucleus concerns:
(a) formation of chromosome (b) DNA replication
(c) Ribosomal RNA synthesis (d) Chromatid separation

33. An organelle that contains hydrolytic enzymes
(a) Lysosome (b) Ribosome (c) Mitochondrion (d) Chloroplast

34. Unicellularity is found in all
(a) Fungi (b) Protozoa (c) Algae (d) Plants

35. Division of labour is present in
(a) Prokaryotes (b) Amoeba (c) Mycoplasma (d) Fungi

36. The tissue also called as the "skin of plants"
(a) Epidermis (b) Cork (c) Permanent Tissue (d) Cuticle

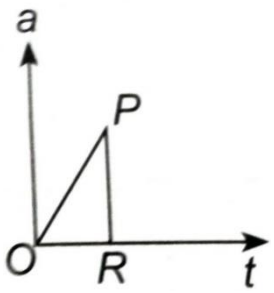
37. Cytoplasm of muscle cells
(a) Sarcoplasm (b) Protoplasm (c) Axoplasm (d) Karyoplasm

38. The number of nuclei present in striped muscles fibre is
(a) One (b) Two (c) Three or more (d) None

39. The anticoagulant present in mast cells
(a) Heparin (b) Hirudin (c) Haemozoin (d) Serum

40. Which of the following is a correct statement?
(a) Distance is the magnitude of displacement in all cases.
(b) When a body moves with uniform speed, then the average speed is same as instantaneous speed.
(c) Average speed is greater than the average velocity if a body is moving in a straight line without reversing its direction.
(d) When a body moves with constant velocity, the average velocity is zero.

41. What would you conclude about the variation in velocity of a cyclist from the given graph?



(a) Velocity changes linearly if acceleration is changing non-linearly.
(b) Velocity becomes zero if acceleration becomes zero.
(c) Velocity changes non-linearly if acceleration is changing linearly.
(d) Velocity becomes uniform if acceleration becomes infinite.

42. In a rocket, fuel burns at the rate of 1 kg s^{-1}. This fuel is ejected from the rocket with a velocity of 60 km s^{-1}. This exerts a force on the rocket equal to
(a) 6000 N (b) 60000 N (c) 60 N (d) 600 N

43. A hammer weighing 2.5 kg moving with a speed of 1 m s^{-1} strikes the head of the nail driving it 10 cm into the wall. The acceleration during impact and the impulse imparted to wall will be respectively.
(a) - 5 m s^{-2} , 2. 5 N s (b) - 10 m s^{-2}, 5 N s
(c) – 7.5 m s^{-2}, 3. 5 N s (d) – 6 m s^{-2}, 4 N s

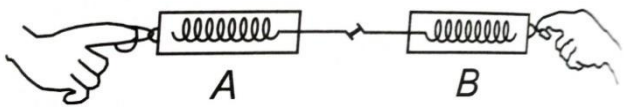
44. A ball is rolling down a slope at a steady speed. Which of the following statements is correct?
(a) Frictional force is greater than the forward force.
(b) There is an unbalanced force downwards.
(c) There are no forces acting on the ball.
(d) The forces acting on the ball are balanced.

45. Which of the following is not correct?
(a) If we drop a 10 lb iron ball and 1 lb aluminium ball from the top of a high platform inside a mine, then both will reach the floor at the same time.
(b) The gravitational force of attraction between the two bodies increases and distance is reduced.
(c) We do not observe small objects moving towards each other because frictional forces balances the gravitational pull.
(d) When a body is thrown up, the acceleration due to gravity at the topmost point is zero because velocity of the body is zero.

46. Rays buys a bag of sugar of weight W at a place on the equator. She takes it to Antarctica. The weight of a sugar bag at Antarctica
(a) Increases (b) Decrease
(c) Remains same as the weight at a place on equator
(d) Cannot be said

47. Consider two spring balances hooked as shown in figure. We pull them in opposite directions. If the reading shown by A is 1.5 N, the reading shown by B will be

(a) 1.5 N (b) 2.5 N
(c) 3.0 N (d) Zero



48. Which of the following represents the correct increasing order of the densities of given substances?

(a) Cotton < Exhaust from chimneys < Honey < Iron < Air
(b) Air < Exhaust from chimneys < Cotton < Honey < Iron
(c) Cotton < Air < Exhaust from chimneys < Iron < Honey
(d) Air < Cotton < Exhaust from chimneys < Iron < Honey

49. Which of the following solutions has the highest mass by mass percentage?

I. 10 g of sodium chloride in 200 g of water
II. 15 g of sugar in 160 g of water
III. 60 g of potassium permanganate in 200 g of water
IV. 20 g of sodium carbonate in 90 g of water.

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

50. Siddharth dissolved a mixture into water and then filtered it. Solid X was left behind as residue in the filter paper and solid Y was obtained by evaporating the filtrate to dryness. X and Y could be respectively

(a) Sodium hydroxide and calcium carbonate
(b) Calcium chloride and sodium carbonate
(c) Calcium carbonate and sodium chloride
(d) Sodium carbonate and calcium chloride

Section – III
Mental Ability

51. In a row of girls, Monika is fifth from the left end and Sonia is sixth from the right end. When they interchange their places, Monika becomes thirteenth from the left end. What will be Sonia's new position from the right end?
(a) 13th (b) 15th (c) 8th (d) 14th

52. If 'W' stand for 'division', 'X' stands for 'multiplication', 'Y' stands for 'Subtraction' and 'Z' stand for 'addition' then which of the following options is correct?
(a) 6 X 20 W 12 *Y* 7 W1 = 38 (b) 6 Y 20 Z 12 × 7 W1 = 70
(c) 6 W 20 Y 12 Z 7 X 1 = 57 (d) 6 X 20 W 12 Y 7 Z 1 = 62

53. Savita walks 20 m to the west, then turns left and walks 18 m, then again turns left and walks 13 m and then turn's right and walks 6 m. How far and in which direction is she now with respect to the starting point?
(a) 25m, South-west (b) 25 m, South – East
(c) 24 m, South – East (d) 20 m, South

54. In a certain code language, '348' means 'she likes apples', '8375' means 'parrots' likes apples lot' and '748' means 'she likes parrots'. What is the code for 'parrots' in that language?
(a) 3 (b) 4 (c) 7 (d) 8

55. Find the correct one: 8, 15, 24, 35, 48, 63, ?
(a) 70 (b) 75 (c) 88 (d) 80

56. Find the odd man out: 3, 7, 15, 17, 22, 27, 29
(a) 22 (b) 15 (c) 17 (d) 27

57. If MADRAS is coded as 56, how is CALCUTTA coded?
(a) 82 (b) 83 (c) 81 (d) 80

58. Which set of letters when sequentially placed at the gaps in the given letter series will complete it?
ONPM, NPMO, PMON, ?
(a) ONPM (b) MONP (c) PNOM (d) NMPO

59. If 3rd December, 1990 is Sunday, what day is 3rd January 1991.
(a) Tuesday (b) Wednesday (c) Thursday (d) Friday

60. What will be the 11th letter to the left of 13th from the right side?
(a) B (b) A (c) D (d) C

61. Sona is the sister of Bobby, Bobby is the brother of Sandeep and Sandeep is the son of Puspha. What is Puspha to Sona?
(a) Sister (b) Sister in Law (c) Mother (d) Daughter

62. If 324 × 150 = 54, 251 × 402 = 48,and 523 × 246 = 120 then 651 × 354 =
(a)120 (b) 144 (c) 85 (d) 60

63. Which two months in year have the same calendar?
(a) June, October (b) April, November
(c) October, December (d) April, July

Directions (64 – 65) : Study the given information carefully and answer the question given below:

(a) P, Q, R, S, T and U are six members of a group of which three are males and three are females.
(b) There are two engineers, two lawyers, one teacher and one doctor in the group.
(c) Q, T, P and R are two married couples and no person in this group has the same profession.
(d) T, a teacher with blue dress, married a male lawyer with brown dress.
(e) Color of the dresses of both the husbands and that of both the wives is the same.
(f) Two persons-have blue dress, two have brown and the remaining one each has black and Green.
(g) P is male engineer whose sister S is also an engineer.

64. Who is wife of P?

(a) Q (b) R (c) S (d) None of these

65. Which of the following group female members?

(a) QSR (b) QST (c) QSU (d) QTU

Directions (66 – 70): Study the given information carefully and answer the questions given below

(a) Eight person E, F, G, H, I, J, K and L are seated around a square table- two on each side.
(b) There are three lady members and they are not seated next to each other.
(c) J is between L and F.
(d) G is between I and F.
(e) H, a lady member, is the second to the left of J.
(f) F, a male member is seated opposite E, a lady member.
(g) There is a lady member between F and I.

66. Who among the following is seated between E and H?

(a) F (b) I (c) J (d) None of these

67. How many persons are seated between K and F?

(a) One (b) Two (c) Three (d) Cannot be determined

68. Who among the following are the three lady members?

(a) E, G and J (b) E, H and G (c) G, H and J (d) None of these

69. Who among the following is to the immediate left to F?

(a) G (b) I (c) J (d) None of these

70. Which of the following is true about J?

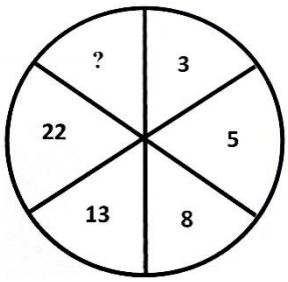
(a) J is male member (b) J is a female member
(c) Position of J cannot be determined (d) None of these

71. Find the missing number.

110	150	70
70	110	30
?	70	-10

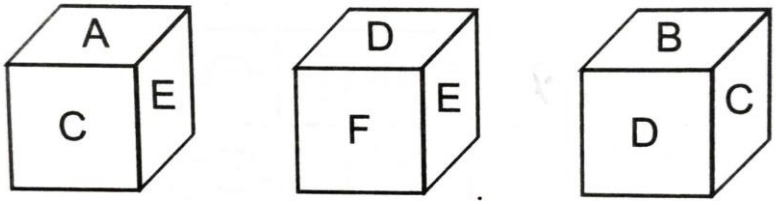
(a) 30 (b) 20 (c) 40 (d) 70

72. Find the missing number in each of the following figures



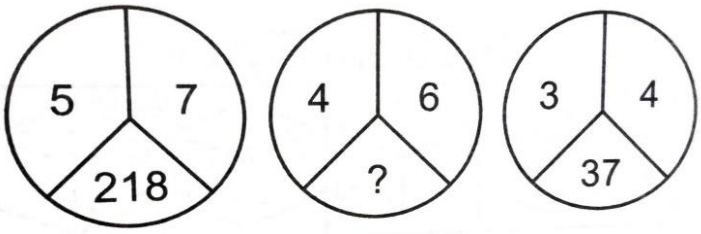
(a) 39 (b) 1 (c) 126 (d) 45

73. Three positions of a dice are shown below. Which of the following alphabet is on the face opposite to the face having alphabet B?



(a) F (b) E (c) A (d) C

74. Find the missing number, if the same rule is followed in all the three figures.



(a) 152 (b) 140 (c) 88 (d) 126

75. If '∩ ′ stands for '+', '⊏' stands for '−', '⊃ ′ stands for '×', '∪ ′ stands for '÷', '‖' stands for '=' and '→'stands for '>', then which of the following expression is not true?

(a) (10 ∩ 2) ⊃ (2 ∩ 2) → (10 ∪ 2)
(b) (20 ⊏ 8) ∪ (4 ⊏ 1) ‖ (4 ∩ 1)
(c) (12 ⊏ 4) ⊃ (5 ⊃ 1) → (10 ∩ 20)
(d) ((10 ∩ 2) ⊃ (2 ∪ 2) → (10 ∪ 2)