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1. If 10^n divides $6^{23} \times 75^9 \times 105^2$, then what is the largest value of n?

   (a) 20 ✓

   (b) 22

   ·(c) 23

   (d) 28

2. What is the digit in the unit's place of the number represented by $3^{98} - 3^{89}$?

   (a) 3

   (b) 6 ✓

   (c) 7

   (d) 9

3. The sum of the squares of four consecutive natural numbers is 294. What is the sum of the numbers?

   (a) 38

   (b) 34 ✓

   (c) 30

   (d) 26

4. The equation $x^2 + px + q = 0$ has roots equal to p and q where $q \neq 0$. What are the values of p and q respectively?

   (a) 1, −2 ✓

   (b) 1, 2

   (c) −1, 2

   (d) −1, −2

5. How many pairs of natural numbers are there such that the difference of their squares is 35?

   (a) 1

   (b) 2 ✓

   (c) 3

   (d) 4

6. If $(b - 6)$ is one root of the quadratic equation $x^2 - 6x + b = 0$, where b is an integer, then what is the maximum value of b^2?

   (a) 36

   (b) 49

   (c) 64

   (d) 81 ✓

7. If $a = \sqrt{7 + 4\sqrt{3}}$, then what is the value of $a + \dfrac{1}{a}$?

   (a) 2

   (b) 3

   (c) 4 ✓

   (d) 7

8. What is the maximum value of the expression $\dfrac{1}{x^2 + 5x + 10}$?

   (a) $\dfrac{15}{4}$

   (b) $\dfrac{15}{2}$

   (c) 1

   (d) $\dfrac{4}{15}$ ✓

A – SDHY-T-MTH

9. If the ratio of the work done by $(x+2)$ workers in $(x-3)$ days to the work done by $(x+4)$ workers in $(x-2)$ days is $3:4$, then what is the value of x?

(a) 8

(b) 10 ✓

(c) 12

(d) 15

10. Which one of the following is **not** correct?

(a) 1 is neither prime nor composite.

(b) 0 is neither positive nor negative.

(c) If $p \times q$ is even, then p and q are always even ✓

(d) $\sqrt{2}$ is an irrational number

11. What is the sum of all integer values of n for which $n^2 + 19n + 92$ is a perfect square?

(a) 21

(b) 19

(c) 0

(d) -19 ✓

12. What is the LCM of the polynomials
$x^3 + 3x^2 + 3x + 1$,
$x^3 + 5x^2 + 5x + 4$ and
$x^2 + 5x + 4$?

(a) $(x+1)^3(x+4)(x^2+x+1)$ ✓

(b) $(x+4)(x^2+x+1)$

(c) $(x+1)(x^2+x+1)$

(d) $(x+1)^2(x+4)(x^2+x+1)$

13. What is the value of
$$\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{9(x-y)(y-z)(z-x)} ?$$

(a) 0

(b) $\frac{1}{3}$ ✓

(c) $\frac{1}{9}$

(d) 1

14. If $X = \{a, \{b\}, c\}$,
$Y = \{\{a\}, b, c\}$ and
$Z = \{a, b, \{c\}\}$,
then $(X \cap Y) \cap Z$ equals to

(a) $\{a, b, c\}$

(b) $\{\{a\}, \{b\}, \{c\}\}$

(c) $\{\Phi\}$

(d) Φ ✓

15. Two numbers p and q are such that the quadratic equation $px^2 + 3x + 2q = 0$ has -6 as the sum and the product of the roots. What is the value of $(p-q)$?

(a) -1

(b) 1

(c) 2 ✓

(d) 3

16. If the sum of a real number and its reciprocal is $\frac{26}{5}$, then how many such numbers are possible?
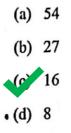
(a) None

(b) One

(c) Two ✓

(d) Four

5

A – SDHY-T-MTH

17. Consider the following statements :

1. If p is relatively prime to each of q and r, then p is relatively prime to the product qr.

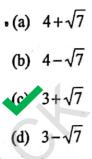2. If p divides the product qr and if p divides q, then p must divide r.

Which of the above statements is/are correct ?

(a) 1 only ✓

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

18. Radha and Rani are sisters. Five years back, the age of Radha was three times that of Rani, but one year back the age of Radha was two times that of Rani. What is the age difference between them ?

(a) 8 ✓

(b) 9

(c) 10

(d) 11

19. A person carries ₹500 and wants to buy apples and oranges out of it. If the cost of one apple is ₹5 and the cost of one orange is ₹7, then what is the number of ways in which a person can buy both apples and oranges using total amount ?

(a) 10

(b) 14 ✓

(c) 15

(d) 17

20. Given y is inversely proportional to $\sqrt{x}$, and $x = 36$ when $y = 36$. What is the value of x when $y = 54$?

(a) 54

(b) 27

(c) 16 ✓

(d) 8

21. What is the square root of $16 + 6\sqrt{7}$?

(a) $4 + \sqrt{7}$

(b) $4 - \sqrt{7}$

(c) $3 + \sqrt{7}$ ✓

(d) $3 - \sqrt{7}$

22. What is the number of digits in 7^{25}, 8^{23} and 9^{20} respectively ? [Given $\log_{10}2 = 0.301$, $\log_{10}3 = 0.477$, $\log_{10}7 = 0.845$]

(a) 21, 20, 19

(b) 20, 19, 18

(c) 22, 21, 20 ✓

(d) 22, 20, 21

23. Let x be the smallest positive integer such that when 14 divides x, the remainder is 7; and when 15 divides x, the remainder is 5. Which one of the following is correct ?

(a) $20 < x < 30$

(b) $30 < x < 40$ ✓

(c) $40 < x < 50$

(d) $x > 50$

A – SDHY-T-MTH

24. Two taps X and Y are fixed to a water tank. If only X is opened, it drains out the full tank of water in 20 minutes. If both X and Y are opened, then they drain out the full tank of water in 15 minutes. If only Y is opened, how long does it take to drain out the full tank of water ?

(a) 30 minutes

. (b) 45 minutes

(c) ✓ 60 minutes

(d) 90 minutes

25. Consider the following statements :

1. $\sqrt{75}$ is a rational number.

2. There exists at least a positive integer x such that $-\dfrac{4x}{5} < -\dfrac{7}{8}$.

3. $\dfrac{x-2}{x} < 1$ for all real values of x.

4. $4{\cdot}232323......$ can be expressed in the form $\dfrac{p}{q}$ where p and q are integers.

Which of the above statements are correct ?

(a) 1 and 2

. (b) 2 and 3

(c) 3 and 4

✓ (d) 2 and 4

26. A library has an average number of 510 visitors on Sunday and 240 on other days. What is the average number of visitors per day in a month of 30 days beginning with Saturday ?

(a) 276

(b) 282

✓ (c) 285

(d) 375

27. If $\dfrac{36}{11} = 3 + \cfrac{1}{x + \cfrac{1}{y + \cfrac{1}{z}}}$, where x, y and z are natural numbers, then what is $(x + y + z)$ equal to ?

(a) ✓ 6

(b) 7

• (c) 8

(d) 9

28. A person sells two items each at Rs. 990, one at a profit of 10% and another at a loss of 10%. What is the combined percentage of profit or loss for the two items ?

(a) ✓ 1% loss

(b) 1% profit

• (c) No profit no loss

(d) 0·5% profit

9

A – SDHY-T-MTH

29. It takes 11 hours for a 600 km journey if 120 km is done by train and the rest by car. It takes 40 minutes more if 200 km are covered by train and the rest by car. What is the ratio of speed of the car to that of the train ?

   (a) ✓ 3 : 2

   (b) 2 : 3

   (c) 3 : 4

   (d) 4 : 3

30. A real number x is such that $(x - x^2)$ is maximum. What is x equal to ?

   (a) $-1 \cdot 5$

   (b) $-0 \cdot 5$

   (c) ✓ $0 \cdot 5$

   (d) $1 \cdot 5$

31. Let a and b be two positive real numbers such that $a\sqrt{a} + b\sqrt{b} = 32$ and $a\sqrt{b} + b\sqrt{a} = 31$. What is the value of $\dfrac{5(a+b)}{7}$?

   (a) 5

   (b) 7

   (c) ✓ 9

   (d) Cannot be determined

32. If $x = \dfrac{1 + \sqrt{3}}{2}$ and $y = x^3$, then y satisfies which one of the following equations ?

   (a) ✓ $8y^2 - 20y - 1 = 0$

   (b) $8y^2 + 20y - 1 = 0$

   (c) $8y^2 + 20y + 1 = 0$

   (d) $8y^2 - 20y + 1 = 0$

33. HCF of two numbers is 12. Which one of the following can never be their LCM ?

   (a) ✓ 80

   (b) 60

   (c) 36

   (d) 24

34. Consider the following statements :

   1. Unit digit in 17^{174} is 7.

   2. Difference of the squares of any two odd numbers is always divisible by 8.

   3. Adding 1 to the product of two consecutive odd numbers makes it a perfect square.

Which of the above statements are correct ?

   (a) 1, 2 and 3

   (b) 1 and 2 only

   (c) ✓ 2 and 3 only

   (d) 1 and 3 only

A – SDHY-T-MTH

35. The rate of interest on two different schemes is the same and it is 20%. But in one of the schemes, the interest is compounded half yearly and in the other the interest is compounded annually. Equal amounts are invested in the schemes. If the difference of the returns after 2 years is ₹482, then what is the principal amount in each scheme ?

(a) ₹10,000

(b) ₹16,000

(c) ✓ ₹20,000

(d) ₹24,000

36. For what value of k can the expression $x^3 + kx^2 - 7x + 6$ be resolved into three linear factors ?

(a) ✓ 0

(b) 1

(c) 2

(d) 3

37. X, Y and Z start at same point and same time in the same direction to run around a circular stadium. X completes a round in 252 seconds, Y in 308 seconds and Z in 198 seconds. After what time will they meet again at the starting point ?
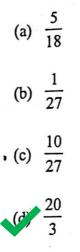
(a) 26 minutes 18 seconds

(b) 42 minutes 36 seconds

(c) 45 minutes

(d) ✓ 46 minutes 12 seconds

38. What is the LCM of $\frac{1}{3}$, $\frac{5}{6}$, $\frac{2}{9}$, $\frac{4}{27}$?

(a) $\frac{5}{18}$

(b) $\frac{1}{27}$

(c) $\frac{10}{27}$

(d) ✓ $\frac{20}{3}$

39. If the equations $x^2 + 5x + 6 = 0$ and $x^2 + kx + 1 = 0$ have a common root, then what is the value of k ?

(a) $-\frac{5}{2}$ or $-\frac{10}{3}$

(b) ✓ $\frac{5}{2}$ or $\frac{10}{3}$

(c) $\frac{5}{2}$ or $-\frac{10}{3}$

(d) $-\frac{5}{2}$ or $\frac{10}{3}$

40. A lent ₹25000 to B and at the same time lent some amount to C at same 7% simple interest. After 4 years A received ₹11200 as interest from B and C. How much did A lend to C ?

(a) ₹20000

(b) ₹25000

(c) ✓ ₹15000

(d) ₹10000
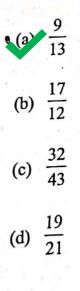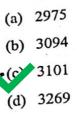
13

A – SDHY-T-MTH

41. A trader sells two computers at the same price, making a profit of 30% on one and a loss of 30% on the other. What is the net loss or profit percentage on the transaction?
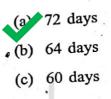
    (a) 6% loss

    (b) 6% gain

    (c) 9% loss ✓

    (d) 9% gain

42. The monthly incomes of A and B are in the ratio $4:3$. Each saves ₹600. If their expenditures are in the ratio $3:2$, then what is the monthly income of A?

    (a) ₹1800

    (b) ₹2000

    (c) ₹2400 ✓

    (d) ₹3600

43. The train fare and bus fare between two stations is in the ratio $3:4$. If the train fare increases by 20% and bus fare increases by 30%, then what is the ratio between revised train fare and revised bus fare?

    (a) $\dfrac{9}{13}$ ✓

    (b) $\dfrac{17}{12}$

    (c) $\dfrac{32}{43}$

    (d) $\dfrac{19}{21}$

44. When N is divided by 17, the quotient is equal to 182. The difference between the quotient and the remainder is 175. What is the value of N?

    (a) 2975

    (b) 3094

    (c) 3101 ✓

    (d) 3269

45. A stock of food grains is enough for 240 men for 48 days. How long will the same stock last for 160 men?

    (a) 72 days ✓

    (b) 64 days

    (c) 60 days

    (d) 54 days

46. The quotient when $x^4 - x^2 + 7x + 5$ is divided by $(x + 2)$ is $ax^3 + bx^2 + cx + d$. What are the values of a, b, c and d respectively?

    (a) $1, -2, 3, 1$ ✓

    (b) $-1, 2, 3, 1$

    (c) $1, -2, -3, -1$

    (d) $-1, 2, -3, -1$

47. The sides of a triangle are 30 cm, 28 cm and 16 cm respectively. In order to determine its area, the logarithm of which of the quantities are required?

    (a) 37, 11, 28, 16

    (b) 21, 30, 28, 7

    (c) 37, 21, 11, 9

    (d) 37, 21, 9, 7 ✓

15

A – SDHY-T-MTH

48. If $\log_{10}1995 = 3\cdot3000$, then what is the value of $(0\cdot001995)^{\frac{1}{8}}$?

(a) $\dfrac{1}{10^{0\cdot3475}}$

(b) $\dfrac{1}{10^{0\cdot3375}}$ ✓

(c) $\dfrac{1}{10^{0\cdot3275}}$

(d) $\dfrac{1}{10^{0\cdot3735}}$

49. What is $(x-a)(x-b)(x-c)$ equal to ?

(a) $x^3-(a+b+c)x^2+(bc+ca+ab)x-abc$ ✓

(b) $x^3+(a+b+c)x^2+(bc+ca+ab)x+abc$

(c) $x^3-(bc+ca+ab)x^2+(a+b+c)x-abc$

(d) $x^3+(bc+ca+ab)x^2-(a+b+c)x-abc$

50. Let XYZ be an equilateral triangle in which $XY = 7$ cm. If A denotes the area of the triangle, then what is the value of $\log_{10}A^4$? (Given that $\log_{10}1050 = 3\cdot0212$ and $\log_{10}35 = 1\cdot5441$)

(a) $5\cdot3070$ ✓

(b) $5\cdot3700$

(c) $5\cdot5635$

(d) $5\cdot6535$

51. A hollow sphere of external and internal diameters 6 cm and 4 cm respectively is melted into a cone of base diameter 8 cm. What is the height of the cone ?

(a) 4·75 cm ✓

(b) 5·50 cm

(c) 6·25 cm

(d) 6·75 cm

52. A solid metallic cylinder of height 10 cm and radius 6 cm is melted to make two cones in the ratio of volume 1 : 2 and of same height as 10 cm. What is the percentage increase in the flat surface area ?

(a) 25%

(b) 50% ✓

(c) 75%

(d) 100%

53. If one side of a right-angled triangle (with all sides integers) is 15 cm, then what is the maximum perimeter of the triangle ?

(a) 240 cm ✓

(b) 225 cm

(c) 113 cm

(d) 112 cm

A – SDHY-T-MTH

54. A thin rod of length 24 feet is cut into rods of equal size and joined so as to form a skeleton cube. What is the area of one of the faces of the largest cube thus constructed ?

(a) 25 square feet

(b) 24 square feet

(c) 9 square feet ✓

(d) 4 square feet

55. Consider a trapezium $ABCD$, in which AB is parallel to CD and AD is perpendicular to AB. If the trapezium has an incircle which touches AB at E and CD at F, where $EB = 25$ cm and $FC = 16$ cm, then what is the diameter of the circle ?

(a) 16 cm

(b) 25 cm ✓

(c) 36 cm

(d) 40 cm

56. Three copper spheres of radii 3 cm, 4 cm and 5 cm are melted to form a large sphere. What is its radius ?

(a) 12 cm

(b) 10 cm

(c) 8 cm

(d) 6 cm ✓

57. The volume of a hemisphere is 155232 cm³. What is the radius of the hemisphere ?

(a) 40 cm

(b) 42 cm ✓

(c) 38 cm

(d) 36 cm

58. A bucket is in the form of a truncated cone. The diameters of the base and top of the bucket are 6 cm and 12 cm respectively. If the height of the bucket is 7 cm, what is the capacity of the bucket ?

(a) 535 cm³

(b) 462 cm³ ✓

(c) 234 cm³

(d) 166 cm³

59. A right circular cone has height 8 cm. If the radius of its base is 6 cm, then what is its total surface area ?
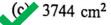
(a) 96π cm² ✓

(b) 69π cm²

(c) 54π cm²
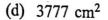
(d) 48π cm²

19

A – SDHY-T-MTH

60. Six cubes, each with 12 cm edge are joined end to end. What is the surface area of resulting cuboid ?

   (a) 3000 cm²

   (b) 3600 cm²
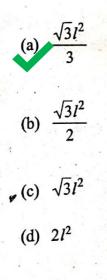
   (c) 3744 cm² ✓

   (d) 3777 cm²

61. The areas of three adjacent faces of a cuboid are x, y and z. If V is the volume of the cuboid, then which one of the following is correct ?

   (a) $V = xyz$

   (b) $V^2 = xyz$ ✓

   (c) $V^3 = xyz$

   (d) $V = (xyz)^2$

62. If l is the length of the median of an equilateral triangle, then what is its area ?

   (a) $\dfrac{\sqrt{3}l^2}{3}$ ✓

   (b) $\dfrac{\sqrt{3}l^2}{2}$

   (c) $\sqrt{3}l^2$

   (d) $2l^2$

63. A piece of wire is in the form of a sector of a circle of radius 20 cm, subtending an angle 150° at the centre. If it is bent in the form of a circle, then what will be its radius ?

   (a) $\dfrac{19}{3}$ cm

   (b) 7 cm

   (c) 8 cm

   (d) None of the above ✓

64. Suppose P, Q and R are the mid-points of sides of a triangle of area 128 cm². If a triangle ABC is drawn by joining the mid-points of sides of triangle PQR, then what is the area of triangle ABC ?

   (a) 4 cm²

   (b) 8 cm² ✓

   (c) 16 cm²

   (d) 32 cm²

65. Let two lines p and q be parallel. Consider two points B and C on the line p and two points D and E on the line q. The line through B and E intersects the line through C and D at A in between the two lines p and q. If $AC : AD = 4 : 9$, then what is the ratio of area of triangle ABC to that of triangle ADE ?

   (a) 2 : 3

   (b) 4 : 9

   (c) 16 : 81 ✓

   (d) 1 : 2

A – SDHY-T-MTH

66. An equilateral triangle and a square are constructed using metallic wires of equal length. What is the ratio of area of triangle to that of square ?

   (a) 3 : 4

   (b) 2 : 3

   (c) $4\sqrt{3}$: 9 ✓

   (d) $2\sqrt{3}$: 9

67. All the four sides of a parallelogram are of equal length. The diagonals are in the ratio 1 : 2. If the sum of the lengths of the diagonals is 12 cm, then what is the area of the parallelogram ?

   (a) 9 cm²

   (b) 12 cm²

   (c) 16 cm² ✓

   (d) 25 cm²

68. ABC is a triangle right angled at B. If AB = 5 cm and BC = 10 cm, then what is the length of the perpendicular drawn from the vertex B to the hypotenuse ?

   (a) 4 cm

   (b) $2\sqrt{5}$ cm ✓

   (c) $\dfrac{4}{\sqrt{5}}$ cm

   (d) 8 cm

69. Two cylinders of equal volume have their heights in the ratio 2 : 3. What is the ratio of their radii ?

   (a) $\sqrt{3}$: 1

   (b) $\sqrt{3}$: $\sqrt{2}$ ✓

   (c) 2 : $\sqrt{3}$

   (d) $\sqrt{3}$: 2

70. The length and breadth of a rectangle are increased by 20% and 10% respectively. What is the percentage increase in the area of the rectangle ?

   (a) 32%

   (b) 30%

   (c) 25%

   (d) 15% ✓

71. If the length of the hypotenuse of a right angled triangle is 10 cm, then what is the maximum area of such a right angled triangle ?

   (a) 100 cm²

   (b) 50 cm²

   (c) 25 cm² ✓
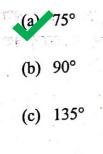
   (d) 10 cm²

23

A – SDHY-T-MTH

72. A square is drawn such that its vertices are lying on a circle of radius 201 mm. What is the ratio of area of circle to that of square ?

   (a) 11 : 7 ✓

   (b) 7 : 11

   (c) 20 : 19

   (d) 19 : 20

73. A right circular cylinder has a diameter of 20 cm and its curved surface area is 1000 cm². What is the volume of the cylinder ?

   (a) 4000 cm³

   (b) 4500 cm³

   (c) 5000 cm³ ✓

   (d) 5200 cm³

74. A piece of wire of length 33 cm is bent into an arc of a circle of radius 14 cm. What is the angle subtended by the arc at the centre of the circle ?

   (a) 75° ✓

   (b) 90°

   (c) 135°

   (d) 150°

75. What is the ratio of the area of a square inscribed in a semicircle of radius r to the area of square inscribed in a circle of radius r ?

   (a) 1 : 2 ✓

   (b) 2 : 5

   (c) 2 : 3

   (d) 3 : 5

76. A hollow right circular cylindrical vessel of volume V whose diameter is equal to its height, is completely filled with water. A heavy sphere of maximum possible volume is then completely immersed in the vessel. What volume of water remains in the vessel ?

   (a) $\dfrac{V}{2}$ ✓

   (b) $\dfrac{V}{3}$

   (c) $\dfrac{2V}{3}$

   (d) $\dfrac{V}{4}$

77. Three parallel lines x, y and z are cut by two transversals m and n. Transversal m cuts the lines x, y, z at P, Q, R respectively; and Transversal n cuts the lines x, y, z at L, M, N respectively. If $PQ = 3$ cm, $QR = 9$ cm and $MN = 10.5$ cm, then what is the length of LM ?
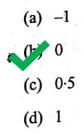
   (a) 3 cm

   (b) 3·5 cm ✓

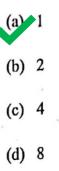   (c) 4 cm

   (d) 4·5 cm

A – SDHY-T-MTH

78. The area of a sector of a circle of radius 4 cm is 25·6 cm². What is the radian measure of the arc of the sector ?

(a) 2·3

(b) 3·2 ✓

(c) 3·3

(d) 3·4

79. Which one of the following is correct in respect of a right angled triangle ?

(a) Its orthocentre lies inside the triangle

(b) Its orthocentre lies outside the triangle

(c) Its orthocentre lies on the triangle ✓

(d) It has no orthocentre

80. Let the bisector of the angle BAC of a triangle ABC meet BC in X. Which one of the following is correct ?

(a) $AB < BX$

(b) $AB > BX$ ✓

(c) $AX = CX$

(d) None of the above

81. What is the value of $\log_{10}(\cos\theta) + \log_{10}(\sin\theta) + \log_{10}(\tan\theta) + \log_{10}(\cot\theta) + \log_{10}(\sec\theta) + \log_{10}(\csc\theta)$?

(a) −1

(b) 0 ✓

(c) 0·5

(d) 1

82. If $\cos^2 x + \cos x = 1$, then what is the value of $\sin^{12}x + 3\sin^{10}x + 3\sin^8 x + \sin^6 x$?
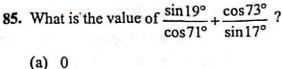
(a) 1 ✓

(b) 2

(c) 4

(d) 8

83. If $0 < \theta < 90°$, $\sin\theta = \frac{3}{5}$ and $x = \cot\theta$, then what is the value of $1 + 3x + 9x^2 + 27x^3 + 81x^4 + 243x^5$?

(a) 941

(b) 1000

(c) 1220

(d) 1365 ✓

84. The angles of elevation of the tops of two pillars of heights h and $2h$ from a point P on the line joining the feet of the two pillars are complementary. If the distances of the foot of the pillars from the point P are x and y respectively, then which one of the following is correct ?

(a) $2h^2 = x^2 y$

(b) $2h^2 = xy^2$

(c) $2h^2 = xy$ ✓

(d) $2h^2 = x^2 y^2$

85. What is the value of $\dfrac{\sin 19°}{\cos 71°} + \dfrac{\cos 73°}{\sin 17°}$?

   (a) 0

   (b) 1

   (c) 2 ✓

   (d) 4

86. The perimeter of a triangle is 22 cm. Through each vertex of the triangle, a straight line parallel to the opposite side is drawn. What is the perimeter of triangle formed by these lines ?

   (a) 33 cm

   (b) 44 cm ✓

   (c) 66 cm

   (d) 88 cm

87. The sides AD, BC of a trapezium $ABCD$ are parallel and the diagonals AC and BD meet at O. If the area of triangle AOB is 3 cm² and the area of triangle BDC is 8 cm², then what is the area of triangle AOD ?

   (a) 8 cm²

   (b) 5 cm² ✓

   (c) 3·6 cm²

   (d) 1·8 cm²

88. A line segment AB is the diameter of a circle with centre at O having radius 6·5 cm. Point P is in the plane of the circle such that $AP = x$ and $BP = y$. In which one of the following cases the point P does *not* lie on the circle ?

   (a) $x = 6.5$ cm and $y = 6.5$ cm ✓

   (b) $x = 12$ cm and $y = 5$ cm

   (c) $x = 5$ cm and $y = 12$ cm

   (d) $x = 0$ cm and $y = 13$ cm

89. The perimeters of two similar triangles ABC and PQR are 75 cm and 50 cm respectively. If the length of one side of the triangle PQR is 20 cm, then what is the length of corresponding side of the triangle ABC ?

   (a) 25 cm

   (b) 30 cm ✓

   (c) 40 cm

   (d) 45 cm

90. Let $PQRS$ be a parallelogram whose diagonals PR and QS intersect at O. If triangle QRS is an equilateral triangle having a side of length 10 cm, then what is the length of the diagonal PR ?

   (a) $5\sqrt{3}$ cm

   (b) $10\sqrt{3}$ cm ✓

   (c) $15\sqrt{3}$ cm

   (d) $20\sqrt{3}$ cm

Read the following frequency distribution for two series of observations and answer the *two* items that follow :

Class interval	Frequency	
	Series-I	Series-II
10-20	20	4
20-30	15	8
30-40	10	4
40-50	x	$2x$
50-60	y	y
Total	100	100

91. What is the mean of frequency distribution of Series-I ?

   (a) 33·6

   (b) 35·6

   (c) 37·6 ✔

   (d) 39·6

92. What is the mode of the frequency distribution of Series-II ?

   (a) 26

   (b) 36

   (c) 46 ✔

   (d) 56

Read the following information and answer the *four* items that follow :

Let the distribution of number of scooters of companies X and Y sold by 5 showrooms (A, B, C, D and E) in a certain year be denoted by $S1$ and the distribution of number of scooters of only company X sold by the five showrooms in the same year be denoted by $S2$.

Showroom	A	B	C	D	E	Total number of scooters sold
$S1$(in %)	19	21	15	33	12	6400
$S2$ (in %)	24	18	20	30	8	3000

93. Number of scooters of company Y sold by showroom E is what per cent of the number of scooters of both companies sold by showroom C ?

   (a) 52

   (b) 54

   (c) 55 ✔

   (d) 56

94. Number of scooters of both the companies sold by showroom B is what per cent more than the number of scooters of company X sold by showroom A ?.

   (a) $78\frac{2}{3}$

   (b) $83\frac{1}{3}$

   (c) $86\frac{2}{3}$ ✔

   (d) $88\frac{1}{3}$

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95. What is the average number of scooters of company Y sold by the showrooms A, C and E ?

   (a) $461\frac{1}{3}$ ✓

   (b) $431\frac{1}{3}$

   (c) $426\frac{1}{3}$

   (d) $416\frac{1}{3}$

96. What is the difference between the number of scooters of both companies sold by showroom A and total number of scooters of company X sold by showrooms B and E together ?

   (a) 416

   (b) 426

   (c) 432

   (d) 436 ✓

Directions for the following four (04) items :

Read the following information and answer the *four* items that follow :

The data shows that Indian roads are turning deadlier over the years.

Year	2014	2015	2016	2017
Number of bikers killed	40957	46070	52750	48746
Number of pedestrians killed	12330	13894	15746	20457
Number of cyclists killed	4037	3125	2585	3559

97. What was the average number of pedestrians killed per day in the year 2017 ?

   (a) 51

   (b) 53

   (c) 54

   (d) 56 ✓

98. What is the approximate percentage change in the pedestrians' fatalities during the period 2014–17 ?

   (a) 66% ✓

   (b) 68%

   (c) 71%

   (d) 76%

99. What is the average number of bikers killed daily in road accidents in the year 2017 ?

   (a) 163

   (b) 152

   (c) 147

   (d) 134 ✓

100. What is the average number of cyclists killed daily in road accidents in 2017 ?

   (a) 10 ✓

   (b) 12

   (c) 19

   (d) 21

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