Sample Paper 4

Time : 90 Minutes **Max Marks : 40**

General Instructions

1. *The question paper contains three parts A, B and C.*
2. *Section A consists of 20 quesions of 1 mark each. Any 16 quesitons are to be attempted.*
3. *Section B consists of 20 quersions of 1 mark each. Any 16 quesions are to be attempted.*
4. *Section C consists of 10 quesions based two Case Studies. Attempt any 8 questions.*
5. *There is no negative marking.*

SECTION-A

Section A consists of 20 questions of 1 mark each. Any 16 quesions are to be attempted.

1. If $x + y = 1$, then $x^3 + y^3 + 3xy =$ .....

(a) 0 (b) 1 (c) 2 (d) None of these

2. Find a point on the x-axis which is equidistant from the points (5, 4) and (–2, 3).

(a) (2, 0) (b) (0, 3) (c) (–2, 2) (d) (3, 0)

3. Two numbers differ by 3 and their product is 54. Find the numbers.

(a) 9 and 6 (b) – 9 and – 6 (c) Both (a) and (b) (d) 9 and – 4

4. A railway half -ticket costs half the full fare but the reservation charges are the same on a half ticket as on full ticket. One reserved first class ticket from station *A* to station *B* costs ₹ 2125. Also, one reserved first class ticket and one reserved half first class ticket from *A* to *B* costs ₹ 3200. Find the full fare from station *A* to *B* and also the reservation charges for a ticket.

(a) ₹ 1100, ₹ 15 (b) ₹ 2100, ₹ 25 (c) ₹ 1000, ₹ 25 (d) ₹ 2000, ₹ 40

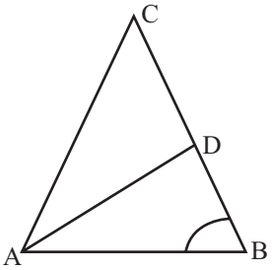
5. $\frac{\tan\theta - \cot\theta}{\sin\theta\cos\theta}$ is equal to

(a) $\sec^2\theta + \text{cosec}^2\theta$ (b) $\cot^2\theta - \tan^2\theta$ (c) $\cos^2\theta - \sin^2\theta$ (d) $\tan^2\theta - \cot^2\theta$

6. I. The L.C.M. of *x* and 18 is 36.
II. The H.C.F. of *x* and 18 is 2.
What is the number *x* ?

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

7. In the figure, ABC is a triangle in which AD bisects $\angle A$, AC = BC, $\angle B = 72°$ and CD = 1cm. Length of BD (in cm) is



(a) 1 (b) $\frac{1}{2}$ (c) $\frac{\sqrt{5}-1}{2}$ (d) $\frac{\sqrt{3}+1}{2}$

8. C is the mid-point of PQ, if P is $(4, x)$, C is $(y, -1)$ and Q is $(-2, 4)$, then x and y respectively are

(a) – 6 and 1 (b) – 6 and 2 (c) 6 and – 1 (d) 6 and – 2

9. If in a lottery, there are 5 prizes and 20 blanks, then the probability of getting a prize is

(a) $\frac{2}{5}$ (b) $\frac{4}{5}$ (c) $\frac{1}{5}$ (d) 1

10. If $a = 2^3 \times 3$, $b = 2 \times 3 \times 5$, $c = 3^n \times 5$ and

L.C.M. $(a, b, c) = 2^3 \times 3^2 \times 5$, then $n =$

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

11. The area of a circular ring formed by two concentric circles whose radii are 5.7 cm and 4.3 cm respectively is

(Take $\pi = 3.1416$)

(a) 43.98 sq.cm (b) 53.67 sq. cm (c) 47.24 sq.cm (d) 38.54 sq.cm

12. The areas of two similar triangles are 81 cm^2 and 49 cm^2 respectively, then the ratio of their corresponding medians is

(a) 7 : 9 (b) 9 : 81 (c) 9 : 7 (d) 81 : 7

13. If $\frac{\cos\theta}{1-\sin\theta}+\frac{\cos\theta}{1+\sin\theta}=4$, then

(a) $\cos\theta=\frac{\sqrt{3}}{2}$ (b) $\sin\theta=\frac{1}{2}$ (c) $\theta = 60°$ (d) $\tan\theta=\frac{1}{\sqrt{3}}$

14. The ratio in which the point (2, y) divides the join of (– 4, 3) and (6, 3) and hence the value of y is

(a) 2 : 3, $y = 3$ (b) 3 : 2, $y = 4$ (c) 3 : 2, $y = 3$ (d) 3 : 2, $y = 2$

15. In a number of two digits, unit's digit is twice the tens digit. If 36 be added to the number, the digits are reversed. The number is

(a) 36 (b) 63 (c) 48 (d) 84

16. Two coins are tossed simultaneously. The probability of getting at most one head is

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{3}{4}$ (d) 1

17. ΔABC is an equilateral triangle with each side of length $2p$. If $AD \perp BC$, then the value of AD is

(a) $\sqrt{3}$ (b) $\sqrt{3}\,p$ (c) $2p$ (d) $4p$

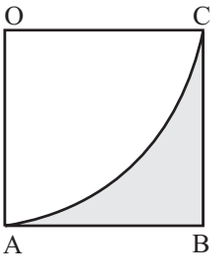
18. Lowest value of $x^2 + 4x + 2$ is

(a) 0 (b) –2 (c) 2 (d) 4

19. Ratio in which the line $3x + 4y = 7$ divides the line segment joining the points (1, 2) and (–2, 1) is

(a) 3 : 5 (b) 4 : 6 (c) 4 : 9 (d) None of these

20. In the adjoining figure, *OABC* is asquare of side 7 cm. *OAC* is a quadrant of a circle with *O* as centre. The area of the shaded region is



(a) 10.5 cm^2 (b) 38.5 cm^2 (c) 49 cm^2 (d) 11.5 cm^2

SECTION-B

Section B consists of 20 questions of 1 mark each. Any 16 quesions are to be attempted.

21. If the value of a quadratic polynomial p(x) is 0 only at x = – 1 and p(– 2) = 2, then the value of p(2) is

(a) 18 (b) 9 (c) 6 (d) 3

22. Which of the following is not correct?

(a) If the diagonals of a quadrilateral divide each other proportionally, then it is a trapezium.

(b) The line segments joining the mid-points of the adjacent sides of a quadrilateral form a parallelogram.

(c) If corresponding sides of two similar triangles are in the ratio 4 : 5, then corresponding medians of the triangles must be in the ratio 4 : 5.

(d) None of the above

23. If 5θ and 4θ are acute angles satisfying

$\sin 5\theta = \cos 4\theta$, then $2\sin 3\theta - \sqrt{3}\tan 3\theta$ is equal to

(a) sin2θ (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{3}}$ (d) 0

24. Determine the value of k for which the following system of equations becomes consistent :
$7x - y = 5$, $21x - 3y = k$.

(a) k = 15 (b) k = 11 (c) k = 4 (d) $k = \frac{11}{2}$

25. If α and β are the zeroes of the polynomial
$f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, the value of K is-

(a) 12 (b) 6 (c) 4 (d) 1

26. $\frac{2\tan 30°}{1+\tan^2 30°}$ is equal to

(a) sin 30° (b) cos 60° (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

27. Find the largest number of four digits exactly divisible by 12, 15, 18 and 27.

(a) 9720 (b) 9728 (c) 9270 (d) 7290

28. The point on the *X*-axis which is equidistant from the points *A*(–2, 3) and *B*(5, 4) is

(a) (0, 2) (b) (2, 0) (c) (3, 0) (d) (–2, 0)

29. The length of the side of a square whose diagonal is 16 cm, is

(a) $8\sqrt{2}$ cm (b) $2\sqrt{8}$ cm (c) $4\sqrt{2}$ cm (d) $2\sqrt{2}$ cm

30. If $3x + 4y : x + 2y = 9 : 4$, then $3x + 5y : 3x - y$ is equal to

(a) 4 : 1 (b) 1 : 4 (c) 7 : 1 (d) 1 : 7

31. An urn contains 6 blue and 'a' green balls. If the probability of drawing a green ball is double that of drawing a blue ball, then 'a' is equal to

(a) 6 (b) 18 (c) 24 (d) 12

32. If $x = 0.\overline{7}$, then $2x$ is

(a) $1.\overline{4}$ (b) $1.\overline{5}$ (c) $1.\overline{54}$ (d) $1.\overline{45}$

33. The point which divides the line joining the points A (1, 2) and B(–1, 1) internally in the ratio 1 : 2 is

(a) $\left(\frac{-1}{3}, \frac{5}{3}\right)$ (b) $\left(\frac{1}{3}, \frac{5}{3}\right)$ (c) (–1, 5) (d) (1, 5)

34. x and y are 2 different digits. If the sum of the two digit numbers formed by using both the digits is a perfect square, then value of $x + y$ is

(a) 10 (b) 11 (c) 12 (d) 13

35. The areas of two similar triangles ABC and PQR are in the ratio 9 : 16. If BC = 4.5 cm, then the length of QR is

(a) 4 cm (b) 4.5 cm (c) 3 cm (d) 6 cm

36. If $\text{cosec } A + \cot A = \frac{11}{2}$, then $\tan A$

(a) $\frac{21}{22}$ (b) $\frac{15}{16}$ (c) $\frac{44}{117}$ (d) $\frac{11}{117}$

37. The centroid of the triangle whose vertices are (3, –7), (–8, 6) and (5, 10) is

(a) (0, 9) (b) (0, 3) (c) (1, 3) (d) (3, 5)

38. A single letter is selected at random from the word "PROBABILITY". The probability that the selected letter is a vowel is

(a) $\frac{2}{11}$ (b) $\frac{3}{11}$ (c) $\frac{4}{11}$ (d) 0

39. On dividing a natural number by 13, the remainder is 3 and on dividing the same number by 21, the remainder is 11. If the number lies between 500 and 600, then the remainder on dividing the number by 19 is

(a) 4 (b) 6 (c) 9 (d) 13

40. If $\Delta ABC \sim \Delta APQ$ and ar (ΔAPQ) = 4 ar (ΔABC), then the ratio of BC to PQ is

(a) 2 : 1 (b) 1 : 2 (c) 1 : 4 (d) 4 : 1

SECTION-C

Case Study Based Questions:

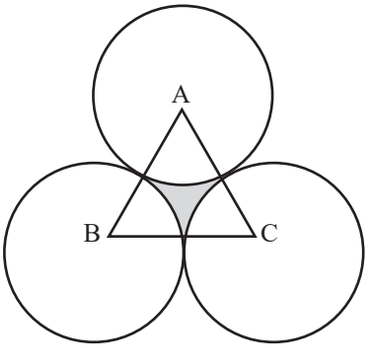
Section C consists of 10 quesions of 1 mark each. Any 8 quesions are to be attempted.

Q 41. - Q 45 are based on case study-I

Case Study-I

Students of class X make a design such that, the area of an equilateral triangle ABC is 17320.5 cm2. With each vertex of the triangle as centre, a circle is drawn with radius equal to half the length of the side of the triangle.

(Use $\pi = 3.14$ and $\sqrt{3} = 1.73205$)



Answer the following questions.

41. Find the length of side of DABC.

(a) 200 cm (b) 105.5 cm (c) 210.3 cm (d) 200.5 cm

42. Find the radius circle.

(a) 200 cm (b) 20 cm (c) 10 cm (d) 100 cm

43. Find the area of each sector.

(a) 5233.3 cm^2 (b) 5223.3 cm^2 (c) 4233.3 cm^2 (d) 522.2 cm^2

44. Find the area of the shaded region.

(a) 17320.5 cm^2 (b) 1620.5 cm^2 (c) 15700 cm^2 (d) 31400 cm^2

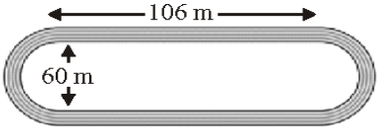
45. Find the perimeter of DABC.

(a) 60 cm (b) 400 cm (c) 600 cm (d) 300 cm

Q 46 - Q 50 are based on case study-II

Case Study-II

On school sport day, a sport teacher make a racing track whose left and right ends are semicircular shown in figure.



The distance between the two inner parallel line segments is 60 m and they are each 106 m long. If the track is 10 m wide then answer the following questions.

46. Find the radius of inner semicircular end.

(a) 30 m (b) 60 m (c) 10 m (d) 40 m

47. Find the radius of outer semicircular end

(a) 30 m (b) 50 m (c) 40 m (d) 70 m

48. The distance around the track along its inner edge is:

(a) 423.57 m (b) 400.57 m (c) 400.32 m (d) 400 m

49. The distance around the track along its outer edge is:

(a) 462.43 m (b) 461.43 m (c) 463 m (d) 463.43 m

50. Find the area of the track.

(a) 4320 m^2 (b) 4230 m^2 (c) 2340 m^2 (d) 4120 m^2