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. $\frac{\tan\theta - \cot\theta}{\sin\theta\cos\theta}$ 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) $\tan^2\theta - \cot^2\theta$

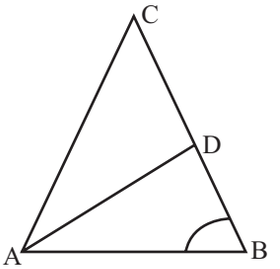
2. I. The L.C.M. of x and 18 is 36.

II. The H.C.F. of x and 18 is 2.

What is the number x ?

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

3. 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) $\frac{\sqrt{3}+1}{2}$

4. 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

5. A sector is cut from a circular sheet of radius 100 cm, the angle of the sector being 240º. If another circle of the area same as the sector is formed, then radius of the new circle is

(a) 79.5 cm (b) 81.6 cm (c) 83.4 cm (d) 88.5 cm

6. 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

7. 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

8. If $a^3 - 3a^2b + 3ab^2 - b^3$ is divided by $(a - b)$, then the remainder is

(a) $a^2 - ab + b^2$ (b) $a^2 + ab + b^2$ (c) 1 (d) 0

9. 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

10. 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

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

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

12. 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, $y = 2$

13. If p_1 and p_2 are two odd prime numbers such that $p_1 > p_2$, then $p_1^2 - p_2^2$ is

(a) an even number (b) an odd number

(c) an odd prime number (d) a prime number

14. 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

15. 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

16. $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta}$ is equal to

(a) $\sec\theta$ (b) $\tan\theta$ (c) $\sqrt{\sec\theta - 1}$ (d) $\cot\theta$

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) $4p$

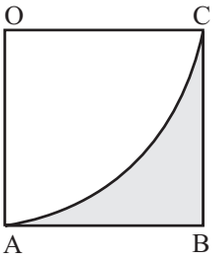
18. Lowest value of $x^2 + 4x + 2$ is

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

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

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

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

23. 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)

24. 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

25. 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

26. 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

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

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

28. A three digit number is to be formed using the digits 3, 4, 7, 8 and 2 without repetition. The probability that it is an odd number is

(a) $\frac{2}{5}$ (b) $\frac{1}{5}$ (c) $\frac{4}{5}$ (d) $\frac{3}{5}$

29. 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)

30. 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

31. The largest non-negative integer k such that 24^k divides 13! is

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

32. 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

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

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

34. 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)

35. 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

36. The value of x, for which the polynomials $x^2 - 1$ and $x^2 - 2x + 1$ vanish simultaneously, is

(a) 2 (b) –2 (c) –1 (d) 1

37. 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

38. If $\sin\theta + \sin^3\theta = \cos^2\theta$, then the value of

$\cos^6\theta - 4\cos^4\theta + 8\cos^2\theta$ is

(a) 1 (b) 4 (c) 2 (d) 0

39. 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

40. The 2 digit number which becomes (5/6)th of itself when its digits are reversed. The difference in the digits of the number being 1, then the two digits number is

(a) 45 (b) 54 (c) 36 (d) None of these

SECTION-C

Case Study Based Questions:

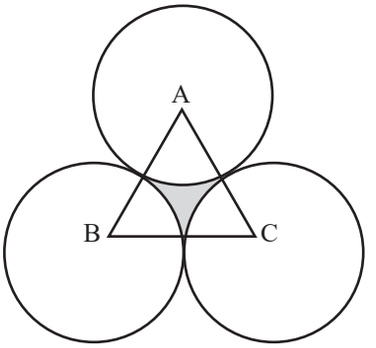
Section C consists of 10 quesions of 1 mark each. Any 8 quesions are to be attempted.

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

An honest person invested some amount at the rate of 12% simple interest and some other amount at the rate of 10% simple interest. He received yearly interest of 130, but if he had interchanged amounts invested, he would have received 4 more as interest. If x be the amount invested at the rate of 12% and y be the amount invested at the rate of 10%, then answer the following questions.

46. What is the yearly interest in terms of x and y ?

(a) $\frac{12x+10y}{100}$ (b) 12 x + 10 y (c) 10 x + 12 y (d) $\frac{10x+12y}{100}$

47. Find the equation corresponding to yearly received interest of ₹130.

(a) 12 x + 10 y = 130 (b) 12 x + 10 y = 13000 (c) 6 x + 5 y = 6500 (d) 5 x + 6 y = 6500

48. Find the equation corresponding to x and y when invested amount is interchanged.

(a) $5x + 6y = 6700$ (b) $6x + 5y = 6700$

(c) $6x + 5y = 6300$ (d) $5x + 6y = 6300$

49. Which of the following is true for x and y ?

(a) $x + y = 120$ (b) $x + y = 1200$ (c) $x - y = 100$ (d) $x - y = 700$

50. How much amount did he invest at different rates ?

(a) $x = ₹ 500, y = ₹ 200$ (b) $x = ₹ 500, y = ₹ 700$

(c) $x = ₹ 100, y = ₹ 500$ (d) $x = ₹ 400, y = ₹ 300$

OMR ANSWER SHEET

Sample Paper No – ☐

- ✶ Use Blue / Black Ball pen only.
- ✶ Please do not make any atray marks on the answer sheet.
- ✶ Rough work must not be done on the answer sheet.
- ✶ Darken one circle deeply for each question in the OMR Answer sheet, as faintly darkend / half darkened circle might by rejected.

Start time : _____ End time _____ Time taken _____

1. Name (in Block Letters)

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2. Date of Exam

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3. Candidate's Signature ☐

SECTION-A

1.	(a)	(b)	(c)	(d)	9.	(a)	(b)	(c)	(d)	17.	(a)	(b)	(c)	(d)
2.	(a)	(b)	(c)	(d)	10.	(a)	(b)	(c)	(d)	18.	(a)	(b)	(c)	(d)
3.	(a)	(b)	(c)	(d)	11.	(a)	(b)	(c)	(d)	19.	(a)	(b)	(c)	(d)
4.	(a)	(b)	(c)	(d)	12.	(a)	(b)	(c)	(d)	20.	(a)	(b)	(c)	(d)
5.	(a)	(b)	(c)	(d)	13.	(a)	(b)	(c)	(d)					
6.	(a)	(b)	(c)	(d)	14.	(a)	(b)	(c)	(d)					
7.	(a)	(b)	(c)	(d)	15.	(a)	(b)	(c)	(d)					
8.	(a)	(b)	(c)	(d)	16.	(a)	(b)	(c)	(d)					

SECTION-B

21.	(a)	(b)	(c)	(d)	29.	(a)	(b)	(c)	(d)	37.	(a)	(b)	(c)	(d)
22.	(a)	(b)	(c)	(d)	30.	(a)	(b)	(c)	(d)	38.	(a)	(b)	(c)	(d)
23.	(a)	(b)	(c)	(d)	31.	(a)	(b)	(c)	(d)	39.	(a)	(b)	(c)	(d)
24.	(a)	(b)	(c)	(d)	32.	(a)	(b)	(c)	(d)	40.	(a)	(b)	(c)	(d)
25.	(a)	(b)	(c)	(d)	33.	(a)	(b)	(c)	(d)					
26.	(a)	(b)	(c)	(d)	34.	(a)	(b)	(c)	(d)					
27.	(a)	(b)	(c)	(d)	35.	(a)	(b)	(c)	(d)					
28.	(a)	(b)	(c)	(d)	36.	(a)	(b)	(c)	(d)					

SECTION-C

41.	(a)	(b)	(c)	(d)	45.	(a)	(b)	(c)	(d)	49.	(a)	(b)	(c)	(d)
42.	(a)	(b)	(c)	(d)	46.	(a)	(b)	(c)	(d)	50.	(a)	(b)	(c)	(d)
43.	(a)	(b)	(c)	(d)	47.	(a)	(b)	(c)	(d)					
44.	(a)	(b)	(c)	(d)	48.	(a)	(b)	(c)	(d)					

No. of Qns. Attempted		Correct		Incorrect		Marks	

Page for Rough Work