Series JSK / 1

Set No. 4

Question Paper Code 031/1/4

Roll No.

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Candidates must write the Questions Paper Code in the space allotted in the OMR Sheet

| **NOTE:** | |
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| i) | Please check that this question paper contains _____ printed pages |
| ii) | Question Paper Code given on the top right-hand side of the question paper should be written in the appropriate place in the OMR Sheet by the candidate. |
| iii) | Please check that this question paper contains 50 Multiple choice questions (MCQs) |
| iv) | 20 minutes additional time has been allotted to read this question paper prior to actual time of commencement of the examination. |

# MATHEMATICS (Theory)
# Term-I

*Time allowed: 90 minutes* *Maximum Marks: 40*

***Section - A***

*Questions no. 1 to 20 are of 1 mark each. Answer any 16 questions from Q. No. 1 - 20.* 16X1=16

1. If HCF $(39,91) = 13$, then LCM $(39,91)$ is:
   (A) 91 (B) 273 (C) 39 (D) 3549

2. $4.\overline{57}$ is a/an:
   (A) integer (B) rational number (C) natural number (D) irrational number

3. The line represented by $4x - 3y = 9$ intersects the y-axis at:
   (A) $(0,-3)$ (B) $\left(\frac{9}{4},0\right)$ (C) $(-3,0)$ (D) $\left(0,\frac{9}{4}\right)$

4. The point on x-axis equidistant from the points $P(5,0)$ and $Q(-1,0)$ is:
   (A) $(2,0)$ (B) $(-2,0)$ (C) $(3,0)$ (D) $(2,2)$

5. If $\triangle ABC$ and $\triangle PQR$ are similar triangles such that $\angle A = 31°$ and $\angle R = 69°$, then $\angle Q$ is:
(A) $70°$ (B) $100°$ (C) $90°$ (D) $80°$

6. Given that $\cos\theta = \frac{\sqrt{3}}{2}$ then the value of $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}$ is:
(A) $-1$ (B) 1 (D) $\frac{1}{2}$ (D) $-\frac{1}{2}$

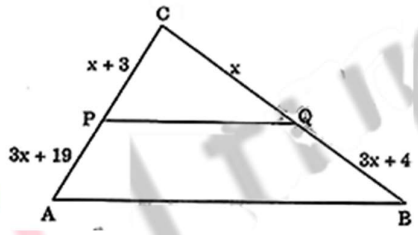
7. The area swept by 7 cm long minute hand of a clock in 10 minutes is:
(A) 77 $cm^2$ (B) $12\frac{5}{6}$ $cm^2$ (C) $7\frac{1}{12}$ $cm^2$ (D) $25\frac{2}{3}$ $cm^2$

8. The probability of getting two heads when two fair coins are tossed together, is:
(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) 1

9. Two positive numbers have their HCF as 12 and their product as 6336. The number of pairs possible for the numbers, is:
(A) 2 (B) 3 (C) 4 (D) 1

10. The pair of equations $y = 2$ and $y = -3$ has
(A) one solution (B) two solutions
(C) infinitely many solutions (D) no solutions

11. In the figure given below, what value of x will make $PQ \parallel AB$ ?




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

12. Given that $\sin\alpha = \frac{\sqrt{3}}{2}$ and $\tan\beta = \frac{1}{\sqrt{3}}$, then the value of $\cos(\alpha - \beta)$ is :
(A) $\frac{\sqrt{3}}{2}$ (B) $\frac{1}{2}$ (C) 0 (D) $\frac{1}{\sqrt{2}}$

13. In a single throw of a die, the probability of getting a composite number is :
(A) $\frac{1}{3}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{5}{6}$

14. The decimal expansion of the rational number $\frac{3177}{250}$ will terminate after
(A) one decimal place (B) two decimal places
(C) three decimal places (D) four decimal places

15. The pair of lines represented by the linear equations $3x + 2y = 7$ and $4x + 8y - 11 = 0$ are
(A) perpendicular (B) parallel
(C) intersecting (D) coincident

16. In an equilateral triangle with length of side p, the length of the altitude is:
(A) $\frac{\sqrt{3}}{2}p$ (B) $\frac{\sqrt{3}}{4}p$ (C) $\frac{\sqrt{3}}{2}p^2$ (D) $\frac{\sqrt{3}}{4}p^2$

17. Given that $\sin\theta = \frac{p}{q}$, $\tan\theta$ is equal to:

(A) $\frac{p}{\sqrt{p^2-q^2}}$ (B) $\frac{q}{\sqrt{p^2-q^2}}$ (C) $\frac{p}{\sqrt{q^2-p^2}}$ (D) $\frac{q}{\sqrt{q^2-p^2}}$

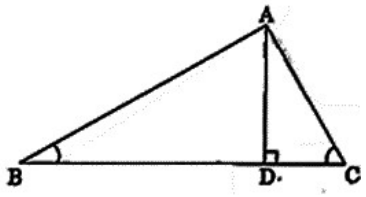
18. A vertical pole of length $19$ m casts a shadow $57$ m long on the ground and at the same time a tower casts a shadow $51$ m long. The height of the tower is:

(A) $171$ m (B) $13$ m (C) $17$ m (D) $117$ m

19. The simplest form of $\sqrt{(1-\cos^2\theta)(1+\tan^2\theta)}$ is:

(A) $\cos\theta$ (B) $\sin\theta$ (C) $\cot\theta$ (D) $\tan\theta$

20. In the given figure, $\angle ABC$ and $\angle ACB$ are complementary to each other and $AD \perp BC$. Then,




(A) $BD \cdot CD = BC^2$ (B) $AB \cdot BC = BC^2$

(C) $BD \cdot CD = AD^2$ (D) $AB \cdot AC = AD^2$

## Section -B

*Questions no. 21 to 90 are of 1 mark each. Answer any 16 questions from Q. No. 21— 40.* *16x1=16*

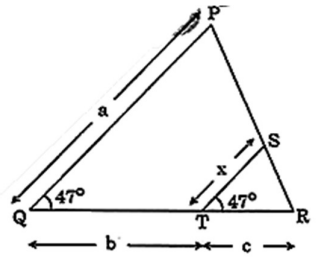
21. If one of the zeroes of a quadratic polynomial $(k-1)x^2 + kx + 1$ is $-3$, then the value of $k$ is :

(A) $\frac{4}{3}$ (B) $-\frac{4}{3}$ (C) $\frac{2}{3}$ (D) $-\frac{2}{3}$

22. If the lengths of diagonals of a rhombus are $10$ cm and $24$ cm, then the perimeter of the rhombus is:

(A) $13$ cm (B) $26$ cm (C) $39$ cm (D) $52$ cm

23. In the given figure, $x$ expressed in terms of $a, b, c$, is:




(A) $x = \frac{ab}{a+b}$ (B) $x = \frac{ac}{b+c}$ (C) $x = \frac{bc}{b+c}$ (D) $x = \frac{ac}{a+c}$

24. $\frac{1}{\text{cosec}\theta(1-\cot\theta)} + \frac{1}{\sec\theta(1-\tan\theta)}$ is equal to:

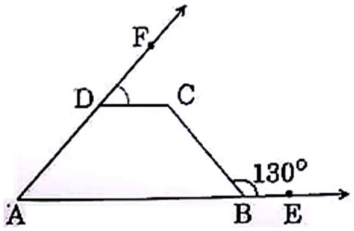
(A) 0 (B) 1 (C) $\sin\theta + \cos\theta$ (D) $\sin\theta - \cos\theta$

25. If ' n ' is any natural number, then $(12)^n$ cannot end with the digit:
(A) 2 (B) 4 (C) 8 (D) 0

26. A wire can be bent in the form of a circle of radius 56 cm. If the same wire is bent in the form of a square, then the area of the square will be:
(A) 8800 $cm^2$ (B) 7744 $cm^2$ (C) 6400 $cm^2$ (D) 3520 $cm^2$

27. The probability that a non-leap year has 53 Wednesdays, in
(A) $\frac{1}{7}$ (B) $\frac{2}{7}$ (C) $\frac{5}{7}$ (D) $\frac{6}{7}$

28. In the given figure, points A, B , C and D are concyclic and $\angle CBE = 130^0$ . Then $\angle FDC$ is:




(A)$130^0$ (B)$80^0$ (C)$50^0$ (D) $30^0$

29. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from Q (2, - 5) and R (- 3, 6), then the coordinates of P are:
(A)(8,16) (B)(10,20) (C)(20,10) (D) (16,8)

30. If the point (x, 4) lies on a circle whose centre is at the origin and radius is 5 cm, then the value of x is:
(A)0 (B) $\pm 4$ (C) $\pm 5$ (D) $\pm 3$

31. The value of $\theta$ for which 2 sin $2\theta = 1$, is:
(A)$15^0$ (B)$30^0$ (C)$45^0$ (D)$60^0$

32. The number 385 can be expressed as the product of prime factors as
(A) $5 \times 11 \times 13$ (B) $5 \times 7 \times 11$ (C) $5 \times 7 \times 13$ (D) $5 \times 11 \times 17$

33. The difference between circumference and radius of a circle is 111 cm. The area of the circle is
(A) 1366 $cm^2$ (B) 1386 $cm^2$ (C) 1376 $cm^2$ (D) 1396 $cm^2$

34. From the letters of the word 'MANGO', a letter is selected at random. The probability that the letter is a vowel, is:
(A) $\frac{1}{5}$ (B) $\frac{3}{5}$ (C) $\frac{2}{5}$ (D) $\frac{4}{5}$

35. If 17x - 19y = 53 and 19x - 17 = 55, then the value of (x + y) is:
(A)1 (B)-1 (C)3 (D)-3

36. The ratio in which the point (-4, 6) divides the line segment joining the points A (— 6, 10) and B (3, - 8) is:
(A)2:5 (B)7:2 (C)2:7 (D)5:2

37. If $sin^2\theta + sin\theta = 1$ then the value of $cos^2\theta + cos^4\theta = 1$ is:

(A)-1 (B)1 (C)0 (D)2

38. The decimal expansion of $\frac{43}{162}$:

(A)is terminating

(B)is non - terminating and non-recurring

(C)is non - terminating and recurring

(D) does not existing

39. If the circumference of a circle is tripled, then its area becomes.
(A)three times (B)nine times (C)eight times (D) two times

40. A father is three times as old as his son. In 12 years time, he will be twice as old as his son. The sum of the present ages of the father and the son is :
(A) 36 years (B) 48 years (C) 60 years (D) 42 years

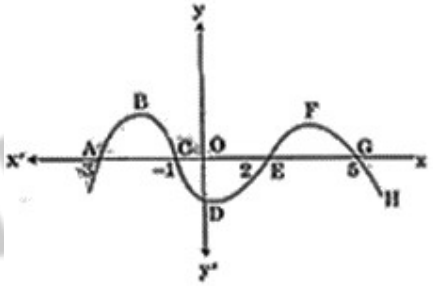
**SECTION -C**

**(Case Study Based Questions)**

*Section C consists of 10 questions of 1 mark each. Attempt any 8 questions from Q.No.41-50.* *8x1 =8*

**Case Study -I**

A car moves on a highway. The path it traces is given below:




Based on the above information, answer the following questions:

41. What is the shape of the curve EFG?
(A)Parabola (B)Ellipse (C)Straight line (D) Circle

42. If the curve ABC is represented by the polynomial $-\left(x^2+4x+3\right)$, then its zeroes are:
(A)1 and -3 (B)-1 and 3 (C)1 and 3 (D) -1 and -3

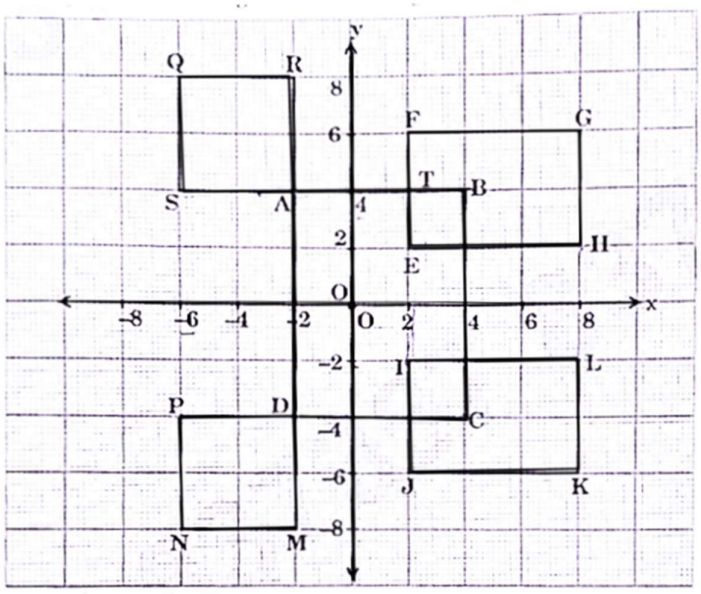
43. If the path traced by the car has zeroes at -1 and 2, then it is given by:
(A) $x^2+x+2$ (B) $x^2-x+2$ (C) $x^2-x-2$ (D) $x^2+x-2$

44. The number of zeroes of the polynomial representing the whole curve, is:
(A)4 (B)3 (C)2 (D)1

45. The distance between C and G is:
(A)4 units (B)6 units (C)8 units (D) 7 units

**Case Study -II**

Shivani is an interior decorator. To design her own living room, she designed wall shelves. The graph of intersecting wall shelves is given below:




based on the above information, answer the following questions:

46. If O is the origin, then what are the coordinates of S?

(A)(-6,-4) (B)(6,4) (C)(-6,4 ) (D) (6,-4)

47. The coordinates of the mid-point of the line -segment joining D and H is:

(A) $\left(-3,\frac{2}{3}\right)$ (B)(3, -1) (C)(3,1) (D) $\left(-3,-\frac{2}{3}\right)$

48. The ratio in which the x-axis divides the line -segment joining the points A and C, is:

(A)2:3 (B)2:1 (C)1:2 (D)1:1

49. The distance between the points P and G is

(A)16 units (B) $3\sqrt{74}$ units (C) $2\sqrt{74}$ units (D) $\sqrt{74}$ units

50. The coordinates of the vertices of rectangle IJKL are:

(A) $I(2,0),J(2,6),K(8,6),L(8,2)$

(B) $I(2,-2),J(2,-6),K(8,-6),L(8,-2)$

(C) $I(-2,0),J(-2,6),K(-8,6),L(-8,2)$

(D) $I(-2,0),J(-2,-6),K(-8,-6),L(-8,-2)$