PRACTICE PAPER FOR FINAL EXAMINATION(1)-2024

MATHEMATICS

CLASS 11

Part-A (Section – I)

Q1. If $\cot x = \dfrac{5}{12}$, x lies in third quadrant. What is the value of $\sec x$?

OR

What is the value of $\sec(1410^0)$.

Q2. While writing the formula of $\cos^2\left(x+\dfrac{\Pi}{3}\right) = \dfrac{1+\cos\left(2x+\dfrac{\Pi}{3}\right)}{4}$

Mannat did a mistake. What is that mistake and correct the formula.

Q3. If the line joining two points A (2, 0) and B (3, 1) is rotated about A in anticlockwise direction through an angle of 15^0. Find the equation of line in new position.

Q4. Rahima asked Rohan, what is the distance between the two line $3x-4y+9=0$ and $3x-4y+5=0$

Q5. Write the co-ordinates of the point on x axis whose distance from the line $x+y-1=0$ is $\sqrt{2}$

OR

What is the distance of a point A (1, 2) from the line $3x+4y+5=0$

Q6. Find the equation of a circle in the first quadrant touching each co-ordinate axes at a distance of one unit from origin.

Q7. Write the radian measure of $5^0\ 37'\ 30''$

Q8. The perpendicular distance of the point P(6, 7, 8) from XY plane will be 6, 7 or 8. Write the correct answer.

Q9. Dilpreet and Divesh were asked to find the value of $\alpha + \beta$ if $\tan\alpha = \dfrac{5}{6}$ and $\tan\beta = \dfrac{1}{11}$. Dilpreet told $\alpha + \beta = 45^0$. But Divesh told that $\alpha + \beta = 30^0$

What is correct answer.

Q10. Evaluate $\displaystyle \lim_{x \to 0} \frac{\sin 4x}{\sin 2x}$ OR $\displaystyle \lim_{x \to 0} \frac{x^2 - 4}{x - 2}$

Q11. Find the derivative of $f(x) = a^x + x^5 - \cos x + \sec x$

Q12. Find equation of hyperbola satisfying the given condition
Vertices $(\pm 2,0)$, foci $(\pm 3,0)$

Q13. If the latus rectum of an ellipse is equal to half of minor axis then what is the eccentricity of ellipse.

Q14. Find the centre and radius of a circle $2x^2 + 2y^2 - 8x = 0$

Q15. There is a triangular park ABC. The co-ordinates of A, B and C are (1, 0, 0) (0, 1, 0) and (0, 0, 1). A flower pot is put at the point of where the three medians meet. What is the co-ordinates of that point.

Q16. Find the equation of ellipse whose vertices are $(\pm 13,0)$ and foci are $(\pm 5,0)$

Section – II

Note : Attempt an 4 subparts. Each question carries mark.

Q17. Rohini is making a project on the topic straight line. She starts drawing lines. She starts to draw a line from origin and moves successively in following manner as shown
1 unit to the right, ½ unit up, ¼ unit to the right, $\frac{1}{8}$ unit down, $\frac{1}{16}$ unit to the right.
In this manner she gets line segments.
Then she draws a line left to origin at a distance of 2 units.
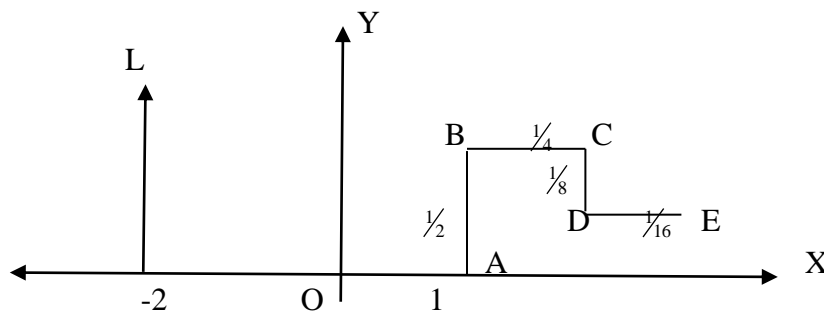
1) Based on the above information what is the following equation of line segment BC
 (a) $x + \frac{1}{2} = 0$ (b) $y + \frac{1}{2} = 0$ (c) $y - \frac{1}{2} = 0$ (d) none

2) What is the equation of line L
 (a) $x - 2 = 0$ (b) $x + 2 = 0$ (c) $y + 2 = 0$ (d) none

3) What is the slope of line segment BC
 (a) 0   (b) ∞ (c) -1   (d) none

4) Slope of line OA
    (a) not defined   (b) 1   (c) -1   (d) none

5) What is the distance between line L and AB
    (a) -1   (b) 3   (c) -3   (d) none

Q18. After completing the chapter Trigonometry Teacher wants to check the knowledge of students.

She writes at the Board $\sin \alpha + \sin \beta = \dfrac{1}{4}$

$\cos \alpha + \cos \beta = \dfrac{1}{3}$

and ask the students to answer the following questions –
1) The value of $\sin(\alpha + \beta)$ is
    (a) $\dfrac{24}{25}$ (b) $\dfrac{13}{25}$ (c) $\dfrac{12}{13}$ (d) none

2) The value of $\cos(\alpha + \beta)$ is
    (a) $\dfrac{12}{25}$ (b) $\dfrac{7}{25}$ (c) $\dfrac{12}{13}$ (d) none

3) The value of $\tan(\alpha + \beta)$ is
    (a) $\dfrac{25}{7}$ (b) $\dfrac{25}{12}$ (c) $\dfrac{25}{13}$ (d) $\dfrac{24}{17}$

4) Domain of $\sin \alpha$ is
    (a) N   (b) R   (c) O   (d) none

5) Range of $\cos \alpha$ is
    (a) 0   (b) $-1 < \cos \alpha < 1$ (c) $[-1,1]$ (d) none

Part-B (Section – III)

Q19. Find the value of
$$\cos 1^0 + \cos 2^0 + \cos 3^0 + ----- + \cos 180^0$$

Q20. $\sec x = \dfrac{13}{5}$, x lies in fourth quadrant. Find the value of other five trigonometric functions.

          OR

A wheel makes 360 revolutions in one minute. Through how many radius does it turn in one second.

Q21. Line through the points $(-2,6)$ and $(4,8)$ is perpendicular to the line through the points $(8,12)$ and $(x,24)$. Find the value of x.

Q22. Find the angle between the lines $y - \sqrt{3}x - 5 = 0$ and $\sqrt{3}y - x + 6 = 0$

Q23. Find the position of point $P(2,3)$ with respect to the circle
$$x^2 + y^2 - 4x - 4y + 4 = 0$$

Q24. Find the equation of parabola vertex $(0,0)$ and passing through $(2,3)$ and axis is along x axis.

Q25. Find the equation of ellipse whose length of major axis is 20 and foci are $(0,\pm 5)$

Q26. Find the limit $\underset{x \to 3}{Lt} \dfrac{x^4 - 81}{2x^2 - 5x - 3}$ OR $\underset{z \to 3}{Lt} \dfrac{z^{\frac{1}{3}} - 1}{z^{\frac{1}{6}} - 1}$

Q27. Find the derivative of $\dfrac{x + \cos x}{\tan x}$ OR $\dfrac{a}{x^4} - \dfrac{b}{x^2} + \sec x$

Q28. Show that the points $(-2,3,5)$ $(1,2,3)$ and $(7,0,-1)$ are collinear.

Section – IV

Q29. Find the equation of lines joining vertex of parabola $y^2 = 6x$ to the points on it which has abscess 24 units.

Q30. Draw the graph of $y = \cos x$ where x varies from 0^0 to 270^0
OR
Draw the graph of $y = \sec x$ when x varies from -90^0 to 90^0

Q31. Find the co-ordinates of the point which divides the line segment joining the points $(1,-2,3)$ and $(3,4,5)$ in the ratio 2:3 internally.

Q32. Find the derivative of function from the first principle
$$f(x) = x + \frac{1}{x}$$
OR
$$f(x) = \tan x$$

Q33. Find equation of the line passing through the point $(2,2)$ and cutting off intercepts on the axes whose sum is 9

Q34. Find the value of

$$\frac{\sin 3\theta + \sin 5\theta + \sin 7\theta + \sin 9\theta}{\cos 3\theta + \cos 5\theta + \cos 7\theta + \cos 9\theta}$$

Q35. A line perpendicular to the line segment joining the points $(1,0)$ and $(2,3)$ divides it in the ratio $1:n$. Find the equation of line.

<u>**Section – V**</u>

Q36. Find the value of
$$\cot 70^{0} + 4\cos 70^{0}$$
OR
Find the value of $\tan 20^{0} + 2\tan 50^{0} - \tan 70^{0}$

Q37. Find the equation of the circle passing through the points $(2,3)$ and $(-1,1)$ whose centre is on the line $x - 3y - 11 = 0$

Q38. If the lines $y = 3x + 1$ and $2y = x + 3$ are equally inclined to the line $y = mx + 4$. Find the value of m
OR
Evaluate $\underset{x \to 0}{Ltf(x)}$ where $f(x) = \begin{cases} \frac{|x|}{x} & , & x \neq 0 \\ 0 & , & x = 0 \end{cases}$