P-4

PERIODIC TEST– 2 (2025-26)
SUBJECT : MATHEMATICS
CLASS : XI

DURATION :1 $\frac{1}{2}$hrs MAX.MARKS : 40

SECTION-A

Questions 1 TO 10 carry 1 mark each

1) The value of $\lim_{x\to 4} \frac{x^3-64}{x-4}$ is

(a) 4 (b) 48 (c) 16 (d) does not exist

2) The perpendicular distance of the point (6 , 7 , 8) from XY plane is

(a) 6 units (b) 7 units (c) 8 units (d) 5 units

3) The octant in which the point (-5, 3 , 2) lie ia

(a) VI (b) II (c) V (d) VIII

4) The equation of the circle with centre at (-3, 2) and radius 4.

(a) $x^2 + y^2 + 6x - 4y + 9 = 0$ (b) $x^2 + y^2 - 6x - 4y + 9 = 0$
(c) $x^2 + y^2 + 6x - 4y - 9 = 0$ (d) $x^2 - y^2 - 6x - 4y + 9 = 0$

5) The equation of parabola with vertex at (0, 0) and focus at (0,2)

(a) $x^2 = 8y$ (b) $y^2 = -8y$ (c) $x^2 = -8y$ (d) $y^2 = 8x$

6) The length of the foot of perpendicular drawn from the point P(3 , 4 , 5) on y- axis is

(a) 10 (b) $\sqrt{34}$ (c) $\sqrt{113}$ (d) $5\sqrt{2}$

7) Equation of the Hyper bola whose vertices are $(\pm 3,0)$ *and foci at* $(\pm 5,0)$*is*

(a) $16x^2 - 9y^2 = 144$ (b) $9x^2 - 16y^2 = 144$

(c) $25x^2 - 9y^2 = 225$ (d) $9x^2 - 25y^2 = 81$

The locus of a point always $x = 0$ xy plane zx plane yz plane x axis

8) The length of the foot of perpendicular drawn from the point P(3 , 4 , 5) on y- axis is

(a) 10 (b) $\sqrt{34}$ (c) $\sqrt{113}$ (d)$5\sqrt{2}$

In the following question , a statement of Assertion is given followed by a corresponding statement of Reason. Mark the correct answer as

(a)Both assertion and reason are true and reason is the correct explanation of assertion
(b)Both assertion and reason are true and reason is the not the correct explanation of assertion
(c)Assertion is true but reason is false.
(d)Assertion is false but reason is true.

9) Assertion(A) :The point (3,-4,5) is equidistant from xy plane and z axis.

Reason(R) : The point (3,-4,5) is at a distance of 5 units from xy plane.

10)Assertion(A): Every circle is an ellipse.

Reason (R): Eccentricity of circle is zero.

SECTION-B

Questions 11 to 14 carry 2 marks each

11) Find the coordinates of a point on Y axis which is at a distance of $5\sqrt{2}$ from the point P(3,-2,5)

12) If a parabolic reflector is 20cm in diameter and 5 cm deep, find the focus.

OR

Find the equation of a circle of radius 5 whose centre lies on x axis and passes through the point (2,3)

13) Evaluate : $\lim_{x\to 0} \frac{x}{\sqrt{a+x}-\sqrt{a-x}}$ $\lim_{x\to 0} \frac{x}{\sqrt{a+x}-\sqrt{a-x}}$

14) The perpendicular from origin to a line meets it at the point (-2 , 9) , find the equation of the line.

SECTION-C

Questions 15 to 17 carry 3 marks each

15) Suppose $f(x) = \begin{cases} \frac{\sin x}{x} + a\cos x, & x < 0 \\ \frac{1-\cos x}{x^2}, & x > 0 \\ b & x = 0 \end{cases}$

and if $\lim_{x \to 0} f(x) = f(0)$

what are the possible values of a and b?

OR

Let $f(x) = \begin{cases} 4x - 5, if\ x \leq 2 \\ x - a, if\ x > 2 \end{cases}$ .Find a if if $\lim_{x \to 2} f(x)$ exists.

16) Find the equation of line passing through (-3,5) and perpendicular to the line joining the points (2,5) and (-3,6).

17) If the latus rectum of an ellipse with axis along x-axis and centre at origin is 10, distance between foci = length of minor axis. then find the equation of the ellipse.

SECTION-D

Question 18 carry 5 marks

18) Find the image of the point (3,4) in the line 2x- 3y + 10 =0

OR

A ray of light is sent along the line x-2y-3=0 upon reaching the line 3x-2y-5=0, the ray is reflected from it. Find the equation of the line containing the reflected ray.

SECTION-E (Case Study Based Questions)

Question 19 to 20 carry 4 marks each

19. A beam is supported at its ends by supports which are 48 metres apart. Since the load is concentrated at the centre, there is a deflection of 6 cm at the centre and the deflected beam is in the shape of a parabola.

Based on the above information, answer the following questions:

(i) Taking the centre of the deflected beam as origin and horizontal and vertical lines through it as the coordinate axes, find the equation of the parabola.

(ii) How far from the centre is the deflection 4.5 cm?

20. A school has placed two surveillance cameras at two corners of a triangular park. The coordinates of the cameras are at A (2 , 3 , 5) and B (6 , 7, 9).Another point C (3 , 5, 7) is considered as a landmark.
(i) Find the distance between the cameras A and B.(1)
(ii)Check if the points A, B and C collinear.

Distance Formula

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2+(z_2-z_1)^2}$$