

### Section-B

**Note: Solve any TEN of the following questions. Each question carries 05 marks.**

- Q.2 Determine the limit of the sequence  $\frac{1.2}{3.4}, \frac{3.4}{5.6}, \frac{5.6}{7.8}, \dots$
- Q.3 Evaluate:  $\lim_{x \rightarrow c} \frac{x^n - c^n}{x^m - c^m}$
- Q.4 Find the point which is equidistant from (2, 1), (5, 2) and (3, 4).
- Q.5 Find the equation of Hyperbola with centre at origin, focus at (6, 0) and eccentricity is 3.
- Q.6 The point (2, -5) is a vertex of a square one of whose side lies on the line  $x - 2y - 7 = 0$ .
- Q.7 The gradient of one of the lines  $ax^2 + 2hxy + by^2 = 0$  is twice that of the other. Show that  $8h^2 - 9ab = 0$ .
- Q.8 Find the derivative of  $\sqrt{\sin x}$  by first principle.
- Q.9 If  $y = (\tan t)^{\ln x}$ . Find  $\frac{dy}{dx}$
- Q.10 Find the extreme value of the function f given by  $f(x) = (x-1)(x^2-2x)$ ,  $\forall x \in \mathbb{R}$ .
- Q.11 Integrate:  $\int 25g \tan^2 5x dx$
- Q.12 Find the equation of the circle passes through the points (0, 0), (3, 0) and (0, -4)
- Q.13 Find the angle between the positive y-axis and the vector  $\hat{a} = \hat{i} + 3\hat{j} + 2\hat{k}$

### SECTION - C (DESCRIPTIVE ANSWER)

Q.14 (a) Calculate approximate value of  $\cos 61^\circ$

(b) Integrate:  $\int \frac{2y dy}{(y^2+1)(y^2+3)}$

Q.15 (a) Find the equation of the perpendicular bisector of the segment joining (3, 4) and (11, 14).

(b) Find the vertex, focus and equation of directrix of parabola

$$y^2 - 6y + 8x - 23 = 0$$

Q.16 (a) Find the area of the triangle formed by the lines

$$y - x = 0; y + x = 0; x - b = 0$$

(b) Find the equation of the tangents to the circle  $x^2 + y^2 = 10$  at the point whose abscissa is 3.