





of y-axis.

6. Find the limit :  $\lim_{x \rightarrow 3} x^3 - 6$

7. Find the area under the curve  $2x + x^3$  between the lines  $x = 1$  and  $x = 2$ .

**Q.3 Solve the following. (Any five out of six)**

**(10)**

1. Find the inverse of the matrix  $A = \begin{bmatrix} 3 & 1 \\ 4 & 2 \end{bmatrix}$ .

2. Differentiate the function  $f(x) = x^4 + \cos x - e^{2x}$  with respect to  $x$ .

3. If  $y = x^2 + 2$  and  $x = t$ , then find  $\frac{dy}{dt}$ .

4. Find the minima of the function  $f(x) = x^2 - 2x$

5. Find the distance between the two points (1,6) and (4,2).

6. Determine the equation of straight line passing through the points (3, -4) and (2,5).

**Q.4 Solve the following. (Attempt any three out of four)**

**(15)**

1. Solve the following system by substitution.

$$2x - 3y = -2$$

$$4x + y = 24$$

2. Find the equations of the bisectors of the angles between the straight lines  $4x - 3y + 4 = 0$  and  $6x + 8y - 9 = 0$ .

3. Evaluate: (a)  $\int x e^x dx$  and

(b)  $\frac{dy}{dx}$  where  $y = x^2 + \cos x + e^{3x}$

4. Find the determinant of the matrix  $A = \begin{bmatrix} 1 & 3 & 3 \\ -2 & 4 & 1 \\ 3 & 1 & 2 \end{bmatrix}$