

Assignment –I
MODULE-1
(ORDINARY DIFFERENTIAL EQUATION OF FIRST ORDER & FIRST DEGREE)

Solve the following differential equation by finding integrating factors:

1. $(y^2 + 2x^2y)dx + (2x^3 - xy)dy = 0$
2. $xdy - ydx = (x^2 + y^2)(xdx + ydy)$
3. $4x^3ydx + (x^4 + y^4)dy = 0$
4. $(3x^2y^4 + 2xy)dx + (2x^3y^3 - x^2)dy = 0$
- 5.

Solve:

1. $y(2x^2y + e^x)dx - (e^x + y^3)dy = 0$
2. $\cos x(\cos x - \sin x \sin y)dx + \cos y(\cos y - \sin x \sin y)dy = 0$
3. $(1 + 4xy + 2y^2)dx + (1 + 4xy + 2x^2)dy = 0$
4. $(y^2e^{xy^2} + 4x^3)dx + (2xye^{xy^2} - 3y^2)dy = 0$

Solve the following differential equations:

1. $dx + xdy = e^{-y} \sec^2 y dy$
2. $\frac{dy}{dx} + \frac{y}{x} \log y = \frac{y}{x^2} (\log y)^2$
3. $\frac{dy}{dx} + \frac{1}{x} \tan y = \frac{1}{x^2} \tan y \sec y$
4. $y(2xy + e^x)dx - e^x dy = 0$
5. $\frac{dy}{dx} = e^{x-y}(e^x - e^y)$
6. $xy - \frac{dy}{dx} = y^3 e^{-x^2}$

Find the general solution of the following equations:

1. $xp^2 + (y - x)p - y = 0$
2. $p^2 - p(e^x + e^{-x}) + 1 = 0$
3. $x^2p^2 + 3xyp + 2y^2 = 0$
4. $p^3 + 2xp^2 - y^2p^2 - 2xy^2p = 0$
5. $y = 2px + p^2y$
6. $p^3 - 4xyp + 8y^2 = 0$
7. $x^3p^2 + x^2py + a^3 = 0$
8. $x = py - p^2$

Obtain the general & singular solutions of the following differential equations:

1. $py = p^2(x - b) + a$
2. $y = px + p - p^2$

Obtain the general solution of the following differential equations:

1. $y = 2px + 4yp^2$

2. $y - 2px + ayp^2 = 0$

3. $(px - y)(x - py) = 2p$

4. $x^2p^2 + yp(2x + y) + y^2 = 0$