

Assignment – 1
FYUGP- 3RD SEMESTER, 2026-27
Ordinary Differential Equations

Topic: Unit -1

Full Marks: 40

Date of Submission: 30-09-2026

Q1. Find the explicit solution of the initial value problem 5

$$(\tan x) \frac{dy}{dx} = y \quad ; y\left(\frac{\pi}{2}\right) = \frac{\pi}{2}$$

Q2. Solve the differential equation by finding the integrating factor of the form $x^p y^k$

$$(3y + 4xy^2) dx + (2x + 3x^2y) dy = 0 \quad 5$$

Q3. Find the explicit solution of the initial value problem 5

$$2y \frac{dy}{dx} = \frac{x}{\sqrt{x^2 - 16}}$$

Q4. Solve the differential equation 5

$$2xe^{2y} \frac{dy}{dx} = 3x^4 + e^{2y}$$

Q5. Solve : 4X5 = 20

- i) Consider the following differential equation $(4x + 3y^2) dx + 2xy dy = 0$. Show that the equation is not exact. Find the integrating factor and solve it.
- ii) Solve: $y^2 dx + (3xy - 1) dy = 0$
- iii) Solve the initial value problem: $x \frac{dy}{dx} + y = x y^{\frac{3}{2}} \quad ; y(1) = 4$
- iv) Solve by reducing its order: $y \frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 = 1$