

Differential Equations
Second Paper

M. M. 75

T. 3 H.

इकाई I. 1. हल कीजिये Solve -

(A) $\frac{dy}{dx} = \frac{x^2 + y^2 + 1}{2xy}$

(B) व्यापक व विचित्र हल ज्ञात कीजिये - Find the general and singular solution - $(8P^3 - 27)x = 12P^2y$ अथवा /OR

2. हल कीजिये Solve -

(A) $(Px^2 + y^2)(Px + y) = (P + 1)^2$

(B) $(3xy - 2ay^2) dx + (x^2 - 2ayx) dy = 0$

इकाई II. 3. हल कीजिये Solve -

(A) $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + 2y = x \log x$

(B) $t dx = (t - 2x) dt$
 $t dy = (tx + ty + 2x - 1) dt$

अथवा /OR

4. हल कीजिये Solve -

(A) $(D^2 - 4D + 4)y = 8x^2 e^{2x} \sin(2x)$

(B) $(x^2y - y^3 - y^2z) dx + (xt^2 - x^2z - x^3) dy + (xy^2 + x^2y) dz = 0$

इकाई III. 5. हल कीजिये Solve -

(A) $(1 + x + x^2) \frac{d^3y}{dx^3} + (3 + 6x) \frac{d^2y}{dx^2} + 6 \frac{dy}{dx} = 0$

(B) $\frac{d^2y}{dx^2} + (1 - \cot x) \frac{dy}{dx} - y \cot x = \sin^2(x)$

अथवा /OR

6. (A) प्राचल विचरण विधि से हल कीजिये -

Solve by the method of variation of parameters -

$\frac{d^2y}{dx^2} - y = \frac{2}{1 + e^x}$

(B) हल कीजिये Solve -

$y \frac{d^2y}{dx^2} - \left(\frac{dy}{dx} \right)^2 = y^2 \log y$

इकाई IV. 7. (A) अवकल समीकरण का श्रेणी हल ज्ञात करो -

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Find the series solution of differential equation -

$$\frac{d}{dx} \left[(1-x^2) \frac{dy}{dx} \right] + n(n+1)y = 0$$

(B) हल करो Solve - $z(p^2 - q^2) = x - y$

अथवा / OR

8. (A) चार्पी विधि द्वारा By Charpit's method - $px + qy = z\sqrt{1+pq}$

(B) हल करो Solve - $z^2(p^2 z^2 + q^2) = 1$

इकाई V. 9. (A) हल करो Solve - $(D^2 + 3DD' + 2D'^2)z = x + y$

(B) हल करो Solve -

$$\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} - 6 \frac{\partial^2 z}{\partial y^2} = x^2 \sin(x+y)$$

अथवा / OR

10. (A) हल करो Solve -

$$x^2 \frac{\partial^2 z}{\partial x^2} - y^2 \frac{\partial^2 z}{\partial y^2} = x^2 y$$

(B) मोंगे विधि द्वारा हल कीजिए Solve by Monge's method -

$$y - t \cos^2 x + P \tan x = 0$$