MM 25 **Differential Equations** **Time 45 Min**

Section A 1 Mark Each

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Write the order and degree of the following differential equations

1. $\frac{dy}{dx} + \sin\left(\frac{dy}{dx}\right) = 0$

2. $x - \sin\left(\frac{dy}{dx}\right) = 0$

3. Solve the differential equation $\frac{dr}{d\theta} = \cos\theta$

Section A 4 Marks Each

4. Show that the differential equation that represents all parabolas having their axis of symmetry coincident with the axis of x is $yy_2+y_1^2 = 0$.

5. Find the differential equation of the family of curves given by $x^2+y^2 = 2$

6. Solve the differential equation cosx (1 + cosy)dx – siny(1 + sinx) dy = 0

7. Show thhat y = a cosnx + bsin nx is a solution of the quadratic equation $\frac{d^2y}{dx^2} + n^2y = 0$

Section A 6 Marks Each

8. Solve the differential equation $\sqrt{1 + x^2 + y^2 + x^2y^2} + xy\frac{dy}{dx} = 0$