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DEPT: PETROLEUM ENGR

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$$\frac{d^2 y}{d\theta^2} + 4 \frac{dy}{d\theta} + 5y = 6 \sin \theta$$

$$m^2 + 4m + 5 = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-4 \pm \sqrt{4^2 - 4(1)(5)}}{2(1)}$$

$$\frac{-4 \pm \sqrt{-4}}{2}$$

$$\frac{-4 \pm j2}{-2 \pm j}$$

$$y = e^{-2\theta} (A \cos \theta + B \sin \theta)$$

P.I

$$4 \cdot y = (\cos \theta + D \sin \theta)$$

$$\frac{dy}{d\theta} = -C \sin \theta + D \cos \theta$$

$$-C \cos \theta - D \sin \theta + 4(-\sin \theta + D \cos \theta) + 5(C \cos \theta + D \sin \theta) = 6 \sin \theta$$

$$-C \cos \theta - D \sin \theta - 4(\sin \theta + 4D \cos \theta + 5C \cos \theta + 5D \sin \theta) = 6 \sin \theta$$

$$-C \cos \theta + 4D \cos \theta + 5C \cos \theta - D \sin \theta - 4C \sin \theta + 5D \sin \theta = 6 \sin \theta$$

$$C \cos \theta (-C + 4D + 5C) + \sin \theta (-D - 4C + 5D) = 6 \sin \theta$$

Comparing Co-efficients

$$-C + 4D + 5C = 0$$

$$-D - 4C + 5D = 6$$

$$4D + 4C = 0 \quad \text{--- (1)}$$

$$-4C + 5D = 6 \quad \text{--- (2)}$$