

Name  $\rightarrow$  Prathamesh Deokar

Date \_\_\_\_\_

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Roll No.  $\rightarrow$  BE19FO4F011

$$Q2 \quad (D^2 - 4)y = e^{2x} - e^{-4x}$$

$$A.E \Rightarrow D^2 - 4 = 0$$

$$D^2 = 4$$

$$D = \pm 2$$

$$C.F = c_1 e^{2x} + c_2 e^{-2x}$$

Now

$$P.I = \frac{1}{f(D)} (e^{ax+b}) + \frac{1}{f(D)} (e^{ax+b})$$

$$\therefore P.I = \frac{1}{D^2 - 4} e^{2x} - \frac{1}{D^2 - 4} e^{-4x}$$

$$D = a = 2$$

$$D = a = -4$$

$$= \frac{1}{0} e^{2x} - \frac{1}{16 - 4} e^{-4x}$$

Case fails

$$\propto \frac{1}{2D} e^{2x}$$

$$\propto \frac{1}{4} e^{2x}$$

$$P.I = \frac{1}{4} x e^{2x} - \frac{1}{12} e^{-4x}$$

sign  $\rightarrow$  ~~170~~

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$$\text{General Sol}^n = C.I. + P.I$$

$$G.S = C_1 e^{2x} + C_2 e^{-2x} + \frac{x e^{2x}}{4} - \frac{e^{-4x}}{12}$$