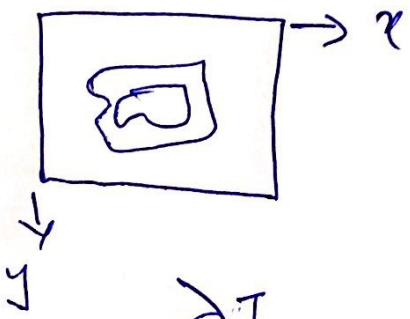
Naveed Ahmad

7880

Differential Eq.

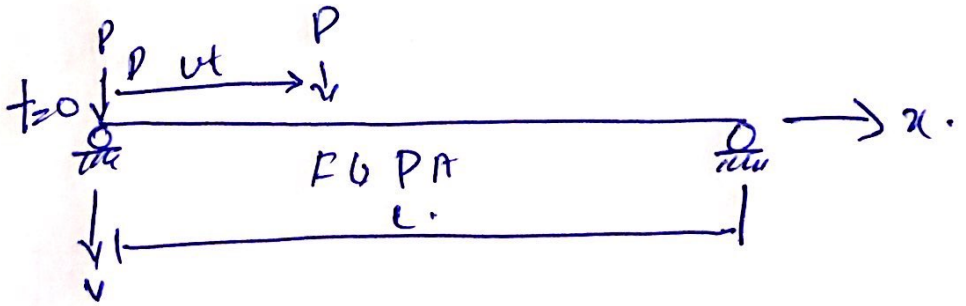
Application ODE

① Transient temperature distribution



$$\frac{\partial T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} = c\frac{\partial T}{\partial t}$$

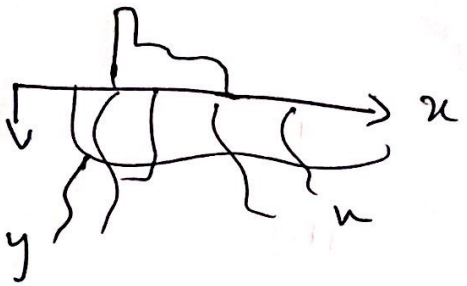
② Beam



$$P_A \frac{\partial^2 v(x,t)}{\partial t^2} + EI \frac{\partial^4 v(x,t)}{\partial x^4} = P_s(x-ut$$

③

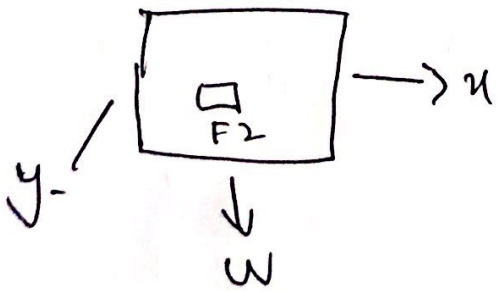
④ Steady State Fluid Flow under beam



$$K_x \frac{\partial h}{\partial x^2} + K_y \frac{\partial h}{\partial y^2} = 0$$

⑤ Plate and elastic foundation

$$\frac{\partial w}{\partial x^4} + 2 \frac{\partial^4}{\partial x^2 dy} + \frac{\partial^4 w}{\partial y^4} = \frac{F_2}{D} - \frac{K}{D} w$$

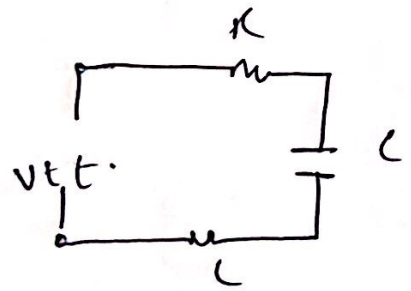


Application of PDE in engineering

① Mechanical System.

$$m\frac{d^2x}{dt} + c\frac{dx}{dt} + Kx = F(t)$$

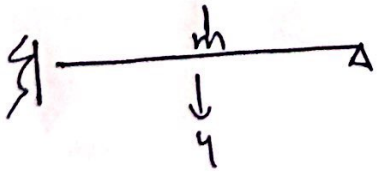
② Electrical Circuit



$$L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{1}{C}q = \frac{dv}{dt}.$$

③ Vibrating beams.

$$m\frac{d^2y}{dt} + c\frac{dy}{dt} + ky = F(t)$$



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① Mechanical System.

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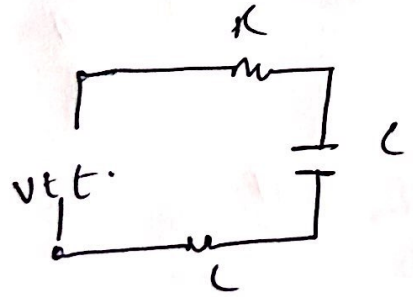

$$L\frac{d^2I}{dt^2} + R\frac{dI}{dt} + \frac{1}{C}I = \frac{dV}{dt}.$$

③ Vibrating beams.

$$m\frac{d^2y}{dt} + c\frac{dy}{dt} + ky = F(t)$$