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Biomedical Engineering

18/ENGG081015

$$y = y_0 e^{kt}$$

$$y = 3y_0; \frac{y}{y_0} = 3$$

$$A \frac{y}{y_0} = e^{4t} = 3 \text{ at } t = 9$$

$$B \frac{y}{y_0} = e^{4t} = 9 \text{ at } t = 18$$

$$^A y_0 = 50 \text{ --- i}$$

$$^B y_0 = 150 \text{ --- ii}$$

$$\therefore y = 50 e^{kt} \text{ --- iii}$$

$$y = 150 e^{kt} \text{ --- iv}$$

$$A \quad 3 e^{4t}$$

$$\ln 3 = kt$$

$$\ln 3 = 9k$$

$$k = \frac{\ln 3}{9}$$

$$k = 0.122$$

$$9 = e^{kt}$$

$$\ln 9 = 18k$$

$$\ln \frac{9}{18} = k$$

$$k = 0.122$$

$$\therefore y = 50 e^{0.122t} \text{ --- A}$$

$$\therefore y = 150 e^{0.122t} \text{ --- B}$$

$$t = 0, 1, 15$$

$$\Delta(t) = 50 \exp(0.122 t)$$

A(t) =

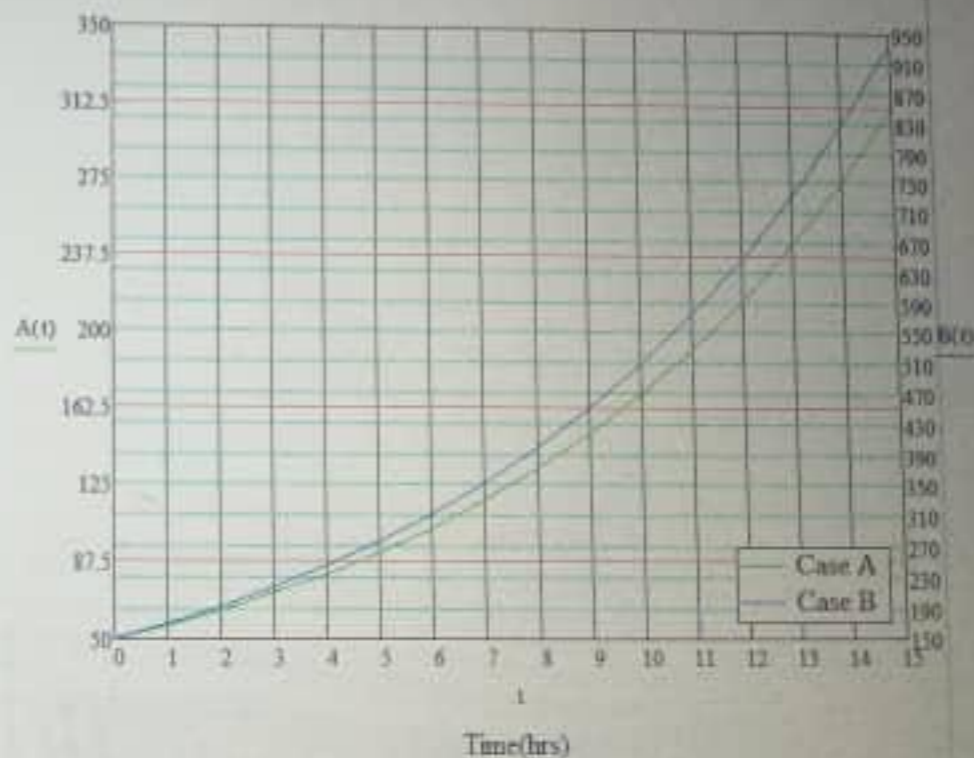
50
56.488
63.817
72.098
81.453
92.022
103.962
117.451
132.691
149.908
169.359
191.334
216.161
244.209
275.896
311.694

$$B(t) = 150 \exp(0.122 t)$$

B(t) =

150
169.463
191.452
216.293
244.358
276.065
311.885
352.354
398.073
449.725
508.078
574.003
648.483
732.626
827.687
935.083

Number of bacteria for case A



Number of bacteria for case B

Numbers of bacteria versus time