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181 ENGR 01 001  
CHEMICAL ENGINEERING

$$y = y_0 e^{kt}$$
$$y = 3y_0, \frac{y}{y_0} = 3$$

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

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

$$\therefore y_0 = 50 \dots i$$

$$y_0 = 150 \dots ii$$

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

$$y = 150 e^{kt} \dots iv$$

$$A \therefore 3 = e^{kt}$$

$$\ln 3 = kt$$

$$\ln 3 = 9k$$

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

$$k = 0.122$$

$$B \ 9 = e^{kt}$$

$$\ln 9 = 18k$$

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

$$k = 0.122$$

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

$$y = 150 e^{0.122t} \dots B$$

$$t = 0, 1, \dots, 15$$

$$A(t) = 50 \exp(0.122 \cdot t)$$

A(t) =

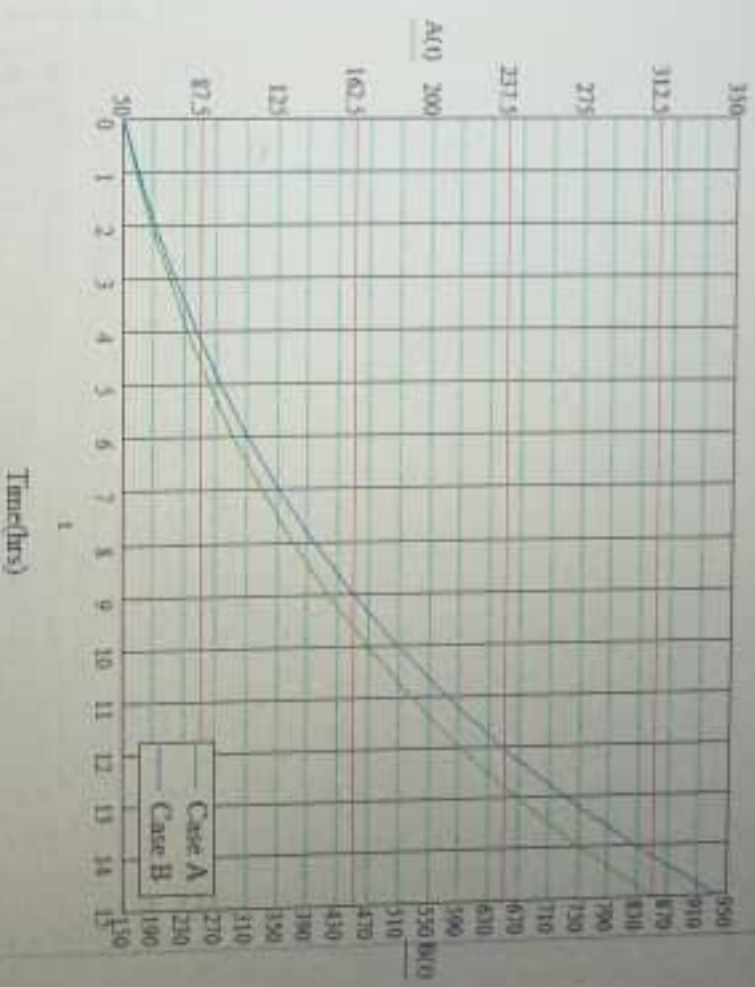
50
56.488
63.817
72.098
81.453
92.022
103.962
117.451
132.691
149.906
169.359
191.334
216.161
244.209
275.896
311.694

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

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



Numbers of bacteria versus time

Number of bacteria for case B