

Chromosome Organ  
Computer Engineering

$$y = y_0 e^{kt} \quad \text{--- (1)}$$

$$y = 3y_0 \quad \text{--- (2)}$$

$$3y_0 = y_0 e^{9k} \quad \text{--- (3)}$$

For case A

$$y_A = y_0 A e^{kt} \quad \text{--- (4)}$$

$$y_0 A = 50 \quad \text{--- (5)}$$

$$y_A = 50 e^{kt} \quad \text{--- (6)}$$

At  $t = 9$  hrs

$$y_A = 50 e^{9k}$$

$$3 \times 50 = 50 e^{9k}$$

$$3 = e^{9k}$$

$$\ln 3 = 9k$$

$$\frac{1.0986}{9} = k$$

$$k = 0.122$$

Substituting

Substituting  $k$  into (6)

$$y_A = 50 e^{0.122t}$$

for

case B

$$y_B = y_0 B e^{kt} \quad \text{--- (7)}$$

$$y_0 B = 150 \quad \text{--- (8)}$$

$$y_B = 150 e^{kt} \quad \text{--- (9)}$$

At  $t = 9$  hrs

$$y_B = 150 e^{9k}$$

$$3 \times 150 = 150 e^{9k}$$

$$3 = e^{9k}$$

$$\ln 3 = 9k$$

$$1.0986 = 9k$$

$$k = \frac{1.0986}{9}$$

$$k = 0.122$$

Substituting  $k$  in (9)

$$y_B = 150 e^{0.122t}$$

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

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

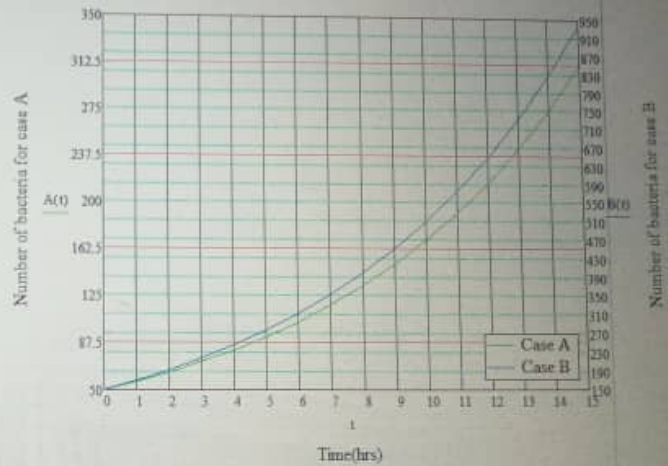
A(t) =

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



Numbers of bacteria versus time