

Sec-1 1Q.1

Given:-

$$5 \text{ day } 20^\circ \text{C BOD,}$$

$$y_{20} = 100 \text{ mg/l}$$

To find one day 37°C BODSolⁿ - The BOD at 20°C is given by

$$y_t = L [1 - (10)^{-k_D t}]$$

$$\text{Assume, } = k_D(20^\circ \text{C}) = 0.1$$

$$100 = L [1 - (10)^{-0.1 \times 5}]$$

$$100 = L [1 - (10)^{-0.5}]$$

$$L = 148.2 \text{ mg/l}$$

2) We know that

$$k_D(37^\circ) = 0.1 [1.047]^{37-20}$$

$$= 0.1 [1.047]^7$$

$$= 0.1 \times 2.2 = 0.22$$

3) we know that

$$Y_t = L[1 - (10)^{-k_d t}]$$

$$Y_t [37^\circ\text{C}] = 146.2 [1 - (10)^{k_d(37^\circ\text{C}) \times t}]$$

$$\therefore [t = 1 \text{ day}]$$

$$= 146.2 [1 - (10)^{-0.22 \times 1}]$$

$$= 58.1 \text{ mg/l} \quad \underline{\underline{\text{Ans}}}$$