

THERMAL CONDUCTION

(b) PARALLEL COMBINATION OF CONDUCTORS

For 1st conductor

$$\frac{\Delta Q_1}{\Delta t} = k_1 \frac{A_1 (T_1 - T_2)}{l} \quad \text{--- (1)}$$

For the 2nd conductor

$$\frac{\Delta Q_2}{\Delta t} = k_2 \frac{A_2 (T_1 - T_2)}{l} \quad \text{--- (2)}$$

For the composite conductor

$$\frac{\Delta Q}{\Delta t} = \frac{\Delta Q_1}{\Delta t} + \frac{\Delta Q_2}{\Delta t} \quad \text{--- (3)}$$

$$K_{eq} \cdot \frac{(A_1 + A_2)(T_1 - T_2)}{l} = k_1 \frac{A_1 (T_1 - T_2)}{l} + k_2 \frac{A_2 (T_1 - T_2)}{l}$$

$$K_{eq} (A_1 + A_2) = k_1 A_1 + k_2 A_2$$

