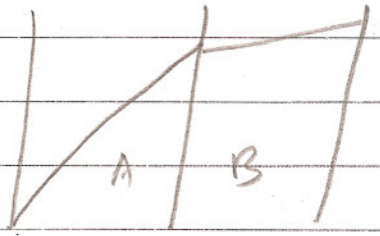
QUIZ 3 ESO212 Paper B Solution Key

(1)



$$\frac{dT_A}{dx} > \frac{dT_B}{dx}$$

$$\Rightarrow k_A < k_B$$

Correct answer: (B)

(2) $$Q = \frac{T_1 - T_2}{\frac{\ln \frac{R_2}{R_1}}{}} (2\pi k L)$$

$$\frac{Q_{new}}{Q_{old}} = \frac{\frac{T_1 - T_2}{\ln \frac{2}{1}} (2\pi k L)}{\frac{T_1 - T_2}{\ln \frac{8}{1}} (2\pi k L)}$$

$$\frac{Q_{new}}{Q_{old}} = \frac{\ln 8}{\ln 2} = 3$$

Correct Ans. (C)

(3) Correct ans: (A) $Bi = \frac{\text{Conductive resistance in solid}}{\text{Conv resistance in fluid}}$

PCS

(4) $\frac{dv_x}{dy} \propto Re^{1/2}$.

$\Rightarrow$ as Re decreases, the velocity gradient decreases

Correct Ans: (A)

(5) $F = \frac{\rho U^2 \, 0.73}{\sqrt{\frac{\rho U}{\mu}}} L^{1/2}$

$\frac{F_{new}}{F_{old}} = \frac{\left(\frac{L}{4}\right)^{1/2}}{L^{1/2}} = \frac{1}{2}$

Correct ans (B)