SHUBHAM GUPTA
180749
Q4 P1

a) $P((t_1)_B < (t_2)_A) = \frac{\lambda_1}{\lambda_1+\lambda_2}$

$P((t_1)_C < (t_2)_A) = \frac{\lambda_1}{\lambda_1+\lambda_2}$

$\therefore \left(\frac{\lambda_1}{\lambda_1+\lambda_2}\right)^2$

(Ans)

b)

$(A_1)_B < (t_2)_A$ $\qquad$ $(A_1)_B > (t_2)_A$

$\frac{\lambda_1}{\lambda_1+\lambda_2}$ $\qquad$ $\frac{\lambda_2}{\lambda_1+\lambda_2}$

$\left(\frac{\lambda_2}{\lambda_1+\lambda_2}\right)^2$ $\qquad$ $\frac{\lambda_1}{\lambda_1+\lambda_2}$

$= \left(\frac{\lambda_1}{\lambda_1+\lambda_2}\right)\left(\frac{\lambda_2}{\lambda_1+\lambda_2}\right)^2 + \frac{\lambda_2\lambda_1}{(\lambda_1+\lambda_2)^2}$

$= \frac{\lambda_1\lambda_2^2}{(\lambda_1+\lambda_2)^3} + \frac{\lambda_1\lambda_2}{(\lambda_1+\lambda_2)^2}$

$$= \lambda_1 \lambda_2 \left(\frac{\lambda_2 + \lambda_1 + \lambda_2}{(\lambda_1 + \lambda_2)^3} \right)$$

$$= \frac{\lambda_1 \lambda_2 (2\lambda_2 + \lambda_1)}{(\lambda_1 + \lambda_2)^3}$$

c) $E(c) = T_1 + T_2 + W_1 + W_2$

$$= \frac{1}{\lambda_1} + \frac{1}{\lambda_2} + \frac{1}{\lambda_1} +$$

P(Both A & b at 2) $1/\lambda_1$

$+ P(B \text{ at } 2) \frac{1}{\lambda_2}$