pkt-switching: $T = \frac{P}{b} \times \frac{x}{P} + (k-1) \times \frac{P}{b} + k \times d$

② $= \cancel{\frac{x}{b} + (\frac{x}{P} - 1) \times \frac{P}{b} + \frac{x}{P} \times d}$

$= \cancel{\frac{x}{b} + \frac{x}{b} - \frac{P}{b} + \frac{x}{P} \times d}$

$= \cancel{\frac{2x-P}{b} + \frac{x}{P} \times d}$

② < ① ⇒ $\cancel{\frac{2x-P}{b} + \frac{x}{P} \cdot d < S + \frac{x}{b} + \frac{x}{P} \cdot d}$

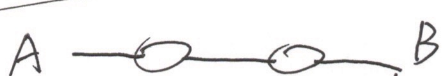
⇒ $\cancel{\frac{x-P}{b} < S}$

T4. (a) $\frac{6\text{Mbps}}{300\text{kbps}} = \frac{6\times10^6}{300\times10^3} = 20$.

(b) $P(k) = C_{50}^{k} (0.2)^k \cdot (0.8)^{50-k}$.

average #: $E(x) = 50 \times 0.2 = 10$

$p(\text{overload}) = p(k > 20) = \sum_{k=21}^{50} C_{50}^{k} \cdot (0.2)^k \cdot (0.8)^{50-k}$.



T5. (1) $d_{prop} = 10ms$ $\quad d_{trans} = \frac{L}{R}$ $\quad R = 2\text{Mbps}$.

$L = S + 160\text{bits}$

$\#n = \frac{16\text{Mbits}}{S\text{bits}} = \frac{16M}{S}$

$\cancel{T = g(S) = \frac{L}{R} \times n + 3d + 2 \times \frac{L}{R} (n-1) \cdot \frac{L}{R}}$

$g(S) = \frac{L}{R} \times n + d + \frac{L}{R} + d + \frac{L}{R} + d = \frac{L}{R} \times (n+2) + 3d$

$= \frac{L}{R} \times (\frac{16M}{S} + 2) + 3 \times \frac{L}{R}$