



$$i) \quad T = \frac{800k}{400k} = 0.2 \text{ sec}$$

$$T_b = \frac{90}{60} \times 0.2 = 0.3$$

$$\text{Avg delay} = \frac{0.2}{1-0.3} = 0.2857 \text{ sec}$$

$$\text{Total Avg. delay} = 0.2857 + 4 = 4.2857 \text{ seconds,}$$

$$ii) \quad \text{Avg. access delay} = \frac{0.2}{1-(0.6)(0.3)} = 0.2439$$

$$\text{Total avg. delay} = 0.4(0) + 0.6(0.2439 + 4) = 2.5463$$

Reduced from 4.2857 seconds to 2.5463 seconds,,

$$\text{iii)} \quad \frac{0.2}{1 - (0.4)(0.3)} = 0.2273$$

$$\text{Total avg. delay} = 0.4(0.2439 + 4) = 1.6909 //$$

$$\text{iv)} \quad \frac{800 \mu}{591} = 0.166$$

$$T_b = \frac{0.166}{1 - \left(\frac{90}{60}\right)(0.16)} = 0.2105$$

Lan part:

$$\frac{0.08}{1 - \left(\frac{90}{60}\right)} = 0.0909$$

$$v) 0.2857 + 0.0919 = 4 = 4.3766 \text{ seconds}$$