W_s = Expected waiting time per unit in the system.

W_q = " " " " " " " queue.

L_s = Expected number of units in the system.

L_q = " " " " " queue.

$$W_s = \frac{1}{\mu - \lambda} = \frac{1}{10-6} = \frac{1}{4} = 0.25$$

$$W_q = \rho \cdot W_s = \frac{\lambda}{\mu} \cdot \frac{1}{\mu - \lambda} = \frac{\lambda}{\mu(\mu - \lambda)} = \frac{6}{10(10-6)} = \frac{6}{40}$$

$$L_s = \frac{\lambda}{\mu - \lambda} = \frac{10}{10-6} = \frac{6}{4}$$

$$L_q = \rho \cdot L_s .$$

P_0 = Probability of 0 unit in the system

$$= 1 - \frac{\lambda}{\mu}$$

$$= 1 - \frac{6}{10}$$

$$= 1 - 0.6$$

$$= 0.4$$

$$P_k = \left(\frac{\lambda}{\mu}\right)^{k+1}$$

$$= \left(\frac{6}{10}\right)^{3+1} = (0.6)^4$$

M/D/1

$$W_q = \frac{\lambda}{2\mu|(\mu-\lambda)|}$$

$$W_s = W_q + \frac{1}{\mu} = \frac{\lambda}{2\mu(\mu-\lambda)} + \frac{1}{\mu} = \frac{\lambda + 2(\mu-\lambda)}{2\mu(\mu-\lambda)}$$

$$= \frac{\lambda + 2\mu - 2\lambda}{2\mu(\mu-\lambda)} = \frac{2\mu-\lambda}{2\mu(\mu-\lambda)}$$

$$L_q = \frac{\lambda^2}{2\mu(\mu-\lambda)}$$

$$L_s = L_q + \frac{\lambda}{\mu} = \frac{\lambda^2}{2\mu(\mu-\lambda)} + \frac{\lambda}{\mu} = \frac{\lambda^2 + 2\lambda(\mu-\lambda)}{2\mu(\mu-\lambda)}$$