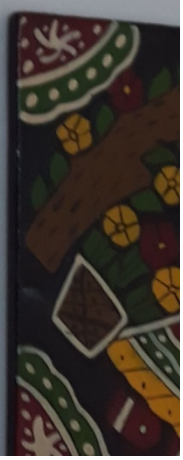
Cache hit

$$E[T_{LAN}] = .0015$$

Total Response time =

$$= \frac{65}{100} \times (.0015) + \frac{35}{100} \times (4.00941)$$

$$= 1.4042 \text{ sec.}$$



Q2)

Using M/M/1 Model

Cache

Average Response time

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

μ = service rate

λ = arrival rate

Cache Miss

$= E[T_{access}] + \text{Internet delay} + \text{LAN delay}$

Internet

$$E[T_{access}] = \frac{1}{\mu - \lambda}$$

$$= .0079 \text{ sec}$$

$$\mu = \frac{2 \times 10^6}{15 \times 10^3}$$

$$\lambda = \frac{35}{100} \times 20$$

$$= (7)$$

Internet dela = 4 sec

$$E[T_{LAN}] = \frac{1}{\mu - \lambda}$$

$$= .0015$$

$$\mu = \frac{4 \times 10^6}{15 \times 10^3}$$

$$\lambda = 20.$$

Cache Miss

$= .0015 + 4 + .0079$

$= 4.0094$.