Q1 :-

From Fig 4-1: TG(+4%) = 87 $/1000 VM

TG(-4%) = 57 $/1000 VM

SC = 4.5 $/1000 VM

$$\Rightarrow A_{Veh} = \frac{[(87+57)/(2+4.5)]}{1000} * 2.5 * 6000 * 15 * 365 = 6283\$$$

$$\Rightarrow P_{Roc} = A_{Veh} * SPW = 108646\$$$

Q2 :-

$$S = \frac{3600}{2.4} = 1500 \text{ pcphL}, \quad \lambda = \frac{40}{100} = 0.4, \quad C = \lambda S = 600$$

$$V/C = \frac{360}{600} = 0.6$$

$\Rightarrow$ From Fig 4-3:- % Stop = 0.8, Stopping Cost = 14.5 $ per 1000 vehs

$$A_{stopping} = \frac{(14.5)}{1000} * (360 * 2 * 0.8)(15)(365) = 45,727\$$$

Q3 :-

Avg speed (speed) = 55 km/hr

Acceleration = 0.4 m/s

} from Ref (5-7)

$V_1 = 30$ km/hr & $V_2 = 80$ km/hr (we need the ~~speed~~ velocity in m/s)

$\Rightarrow V_1 = 8.33$ m/s & $V_2 = 22.22$ m/s

$$\Rightarrow (V_2)^2 = (V_1^2) + 2aL$$

$$\therefore L = 530 \text{ m}$$