Activity # 02

(a)

$K = 10$ $N_0 = 10,000,00$

$$P = \frac{10}{1000000}$$

$P = 0,00001$

$P = 0,001$ % contacts per day

(b)

8% contacts between infection & susceptible

$b = 8\%$

$b = 0,08$ contacts between infection & susceptible per day

(c)

transmission constant $= \left(\frac{K}{N_0}\right)^b$

$= \left(\frac{10}{1000000}\right)^{0.08}$

$= (0.00001)^{0.08}$

$= 0.00000008$

(d)

$I_u = 500$

$\$ = 900000$

Number of possible contact per day $= I_u \times S$

$= 500 \times 900000$

$= 450000000$

(e)

Rate of change S to S_q

$$= q_v \frac{k(1-b) I_4 S}{N_0}$$

assuming $q_v = 0.1$ as for given in part (f),

$$= \frac{0.1 (10) (1-0.08) 500 \times 900000}{1000000}$$

$$= \frac{0.1 (10) (0.92) 450000000}{1000000}$$

$$= \frac{414000000}{1000000}$$

Rate of change = 414 per day

S to S_q

(f)

$$R_0 = \left(\frac{kb}{v+m+w}\right)(1-q)$$

$$= \frac{10\,(0.06)}{(0.04+0.0975+0.0625)^{(1-0.1)}}$$

$$= \frac{0.6}{0.2}\,(0.90)$$

$$= \frac{0.54}{0.2}$$

$$= 2.7$$

$R_0 > 1$

So this is an epidemic