

Question 5.

a)  $E(r_x) = r_f + \beta_x (E(\text{market}) - r_f)$   
 $= 4\% + 1.5 (10\% - 4\%) = 13\%$

$$r_D = r_{WACC} = \frac{D}{D+E} r_D + \frac{E}{D+E} r_E \quad (\text{no tax})$$

$D = 4 \text{ million,}$

$E = 1000000 \times 80 = 8 \text{ million}$

$$\text{So } \frac{D}{D+E} = \frac{4}{12} = \frac{1}{3} \quad \frac{E}{D+E} = \frac{2}{3}$$

$r_D = \rightarrow r_{WACC} = \frac{1}{3} \times 6\% + \frac{2}{3} \times 13\% = 8.67\% + 2\% = \underline{\underline{10.67\%}}$

b) For  $T_0$ , capital outflow = -950000

$T_1, CF = 1100000$

$$NPV = -950000 + \frac{1100000}{1+10.67\%} = 43945.97$$

Yes because the  $NPV > 0$ , so taking it is right!

c) According to M&M theorem, the cost of capital of a firm doesn't depend on its capital structure if there is no taxes,

The cost of equity will be increased, since the larger the leverage of a company the riskier it would be. (bankruptcy)

For the beta,  $\beta_E = \beta_U + \frac{D}{E} (\beta_U - \beta_D)$ , Here,  $\beta_U$  and  $\beta_D$

do not depend on capital structure, so if  $\frac{D}{E}$  changes,

$\beta_E$  will be changed!

$$d) r_{WACC}^* = \frac{D}{E+D} r_D (1 - \text{Tax rate}) + \frac{E}{D+E} r_E$$

$$< \frac{D}{E+D} r_D + \frac{E}{D+E} r_E = r_{WACC} \text{ in a)}$$

So, the new WACC would be below the one in question  
a)