BUSS207
Assignment 3

1. a) 97.667% of 1000 = $976.67
   b) YTM on this bond

   PV=976.67, PMT= 70/2= 35, N= 2 X 2 = 4, FV= -1000, CPT I/Y= 4.14 %/6 months
   Therefore, YTM (annual) = 4.14% X 2 = 8.28%

   c) Price = 35(PVIFA 4, 4.5%) + 1000 (PVIF 4, 4.5%)
   = 964.12
   PMT= -35, N=4, FV= -1000, I/Y= 9%/2 = 4.5%, CPT PV= 964.12
   No. Since, the market price is too high (964.12 vs. 976.67). In my opinion, the bond is overvalued by the market.

2.
   a) 20 – yr: Price = 70(PVIFA 9%, 20) + 1000(PVIF 9%, 20) = 817.43
   5 – yr: Price = 70(PVIFA 9%, 5) + 1000(PVIF 9%,5) = 922.21
   b) Total rate of return = Current Yield + Cap. Gain

   1. 20-yr bond.
   Current Yield = Annual Coupon/Purchase Price = 70/817.43 = 8.56%

   Price = 70(PVIFA 11%, 19) + 1000(PVIF 11%, 19)
   = 686.43

   TRR = 8.56% + (686.43 – 817.43)/817.43 = 8.56% + (-16.03%)
   = -7.46%
   2. 5-yr bond
   Current Yield = 70/922.21 = 7.59%
   Price = 70(PVIFA 11%, 4) + 1000(PVIF 11%, 4)
   = 875.90

   TRR = 7.59% + (875.90 – 922.21)/922.21 = 7.59% + (-5.02%) = 2.57%

   c) 1. Current Yield = 8.56%
   Price = 70(PVIFA 13%, 19) + 1000(PVIF 13%, 19) = 583.72
   TRR = 8.56% + (-28.59%) = -20.03%

   2. Current Yield = 7.59%
   Price = 70(PVIFA 13%, 4) + 1000(PVIF 13%, 4) = 821.53
   TRR = 7.59% + (-10.92%) = -3.33%

   d) 5-yr bond had better returns in both cases. Between two bonds, only difference is the time-to-maturity. The longer maturity bond experiences higher price drop at a given increase in market interest rate change, which illustrates interest rate risk of bonds.

3. K_{RF} = 3%, K_M = 14%, β = 2.0
   D_0 = 2.50, g = 10%
   Using constant growth model,

$K_s = K_{RF} + \beta (K_M - K_{RF})$ from CAPM
$= 3\% + (2.0 \times 11) = 25\%$

$P_0 = D_1/(K_s – g) = D_0(1+g)/ (K_s – g) = 2.5(1+0.10)/(0.25 – 0.1)$
$= \$18.33$
Therefore, it's NOT a good buy since you are buying it at $25, which should be worth only $18.33

4. $D_0 = \$1.50$, $K_{RF} = 3\%$, $K_M - K_{RF} = 9\%$

If entering, $g = 13\%$, $\beta = 1.9$
$K_s = 3\% + 1.9(9\%) = 20.1\%$
$P_0 = 1.50(1+0.13)/(0.201 – 0.13) = 23.87$

If not entering, the current estimates will be applied.
$Ks = 3\% + 1.5(9\%) = 16.5\%$
$P_0 = 1.50(1+0.08)/(0.165 – 0.08) = 19.06$

Thus, stock price will increase from $19.06 to $23.87 if entering the market, which will increase shareholders' wealth. Therefore Enter!

5. a. $D_0 = \$0.72$, $Ks = 12\%$
Step 1: Estimate the dividends
$D_0 = \$0.72$
$D1 = 0.72(1+0.16) = \$0.84$
$D_2 = 0.84(1+0.16) = \$0.97$
$D_3 = 0.97(1+0.16) = \$1.13$
$D_4 = 1.13(1+0.09) = \$1.23$
Step 2: Compute Present Value

$P_3 = D_4/(Ks – g) = 1.23 / (0.12 – 0.09) = \$41$

$P_0 = PV(D1) + PV(D2) + PV(D3) + PV(P_3) = \$31.51$

CF0 = 0, C01 = 0.84, C02 = 0.97, C03 = 1.13 + 41 = 42.13

I = 12, CPT NPV = $31.51

The recommendation should be "sell" since the current market price is higher than $31.51

b) $g = 10\%$, $D_0 = 0.72$, $Ks = 12.5\%$
$P_0 = 0.72 (1+0.1)/(0.125 – 0.1) = 0.792/0.025 = \$31.68$
The recommendation should be "sell"

c) $\$33 = D_1/(Ks – g) = 0.72 (1+g)/(0.12 – g)$
$33(0.12 – g) = 0.72(1+g) = 0.72 + 0.72g$
$3.96 – 33g = 0.72 + 0.72g$
$33.72g = 3.24$

Therefore, $g = 9.61\%$