Problem Set I Solutions

MCQ

1) A
2) D
3) D
4) B
5) A
6) A
7) C
8) C

Problems

1) a) The amount needed when Susan is ready to retire is:

$PVA = \$105{,}000\{[1 - (1/1.07)^{20}] / 0.07\} = \$1{,}112{,}371.50$

If Susan makes equal deposits into the account, this is the annuity with the FVA equal to the amount needed in retirement. The required savings each year will be:

$FVA = \$1{,}112{,}371.50 = C[(1.07^{30} - 1) / 0.07]$

$C = \$11{,}776.01$

b) Here we need to find a lump sum savings amount. Using the FV for a lump sum equation, we get:

$FV = \$1{,}112{,}371.50 = PV(1.07)^{30}$

$PV = \$146{,}129.04$

2) g= (.6)*(.2) = .12

$$\frac{P_0}{E_1} = \frac{Payout\ Ratio}{r-g} = \frac{.4}{.16-.12} = 10$$

3) $PV = C\{[1/(r - g)] - [1/(r - g)] \times [(1 + g)/(1 + r)]^t\}$

$PV = \$45{,}000\{[1/(0.12 - 0.035)] - [1/(0.12 - 0.035)] \times [(1 + 0.035)/(1 + 0.12)]^{25}\}$

$PV = \$455{,}816.18$

Next year's bonus = 0.10($45,000)

Next year's bonus = $4,500

$PV = C\{[1/(r - g)] - [1/(r - g)] \times [(1 + g)/(1 + r)]^t\}$

$PV = \$4{,}500\{[1/(0.12 - 0.035)] - [1/(0.12 - 0.035)] \times [(1 + 0.035)/(1 + 0.12)]^{25}\}$

$PV = \$45{,}581.62$

PV = PV(Salary) + PV(Bonus) + Bonus paid today

PV = $455,816.18 + 45,581.62 + 10,000

PV = $511,397.80

4) D1= 19 , D2= 19(.92) =17.48 , D3= 17.48(.92)=16.0816, D4=16.0816(0.92)=14.795072, D5=50, D6= 55 , D7=55 , D8=55(1.03)=56.65 , P7=56.65/.14-.03=51.5

So, $P_0 = \frac{19}{(1.14)} + \frac{17.48}{(1.14)^2} + \frac{16.0816}{(1.14)^3} + \frac{14.795072}{(1.14)^4} + \frac{50}{(1.14)^5} + \frac{55}{(1.14)^6} + \frac{55+51.5}{(1.14)^7} = \$143.31$

5) The monthly interest rate = APR / *k* = 0.075 / 12 = 0.00625 or 0.625%.
Now:
PV = 24,000 (25,000 - 1000 rebate)
I = 0.625
FV = 0
N = 60
Compute *PMT* = $480.91.

Dealership:
First we need the monthly interest rate = APR / *k* = 0.039 / 12 = 0.00325 or 0.325%.
Now:
PV = 25,000 (no rebate)
I = 0.325
FV = 0
N = 60
Compute *PMT* = $459.29

Since 459.29 < 480.91, go with the dealership financing and forgo the rebate

Essay

1) Our basic principle of stock valuation is that the value of a share of stock is simply equal to the present value of all of the expected dividends on the stock. According to the dividend growth model, an asset that has no expected cash flows has a value of zero, so if investors are willing to purchase shares of stock in firms that pay no dividends, they evidently expect that the firms will begin paying dividends at some point in the future.

2) Bond issuers look at outstanding bonds of similar maturity and risk. The yields on such bonds are used to establish the coupon rate necessary for a particular issue to initially sell for par value. Bond issuers also simply ask potential purchasers what coupon rate would be necessary to attract them. The coupon rate is fixed and simply determines what the bond's coupon payments will be. The required return is what investors actually demand on the issue, and it will fluctuate through time. The coupon rate and required return are equal only if the bond sells for exactly par.