Question1

a) g = payout x ROA = 50% x 20% = 10%
Earnings = $2; Dividends = $1
P=dividend/(r-g) = $1/(0.2-0.1) = $10
Dividend Yield = Dividend/P = $1/$10 = 10%
Capital Gain = g = 10%

b) and c) Since r = ROA, then payout policy does not affect prices. P = $10 in both questions

Question 2

a) Composition of the portfolios

Value	weight
1,200,000	24.57%
2,560,000	52.41%
1,125,000	23.02%
4,885,000	

Growth	Weight
1,100,000	19.64%
4,500,000	80.36%
5,600,000	

b) Composition of portfolio

Value	4,885,000	46.59%
Growth	5,600,000	53.41%
	10,485,000	

c) Since beta of market portfolio is 1, we have that 1 = 0.5341 x 1.5 + 0.4659 x beta. So, beta of Value portfolio is 0.427.

Question 3

a) Beta of stock is 1.2 (0.048/0.2^2)
Return of stock = 6% + 1.2*7.5% = 15%
S = $100m
B = $30
Wacc = (100/130)*15% + (30/130)*8%*(1-0.35) = 12.74%
NPV = -40 + 13*A(5,12.74%) = 6.016 (>0) Yes

b) The same rate. The wacc uses target ratios of debt to equity. If a project is financed with a different ratio, some other project will compensate it and make the target ratio for the set of projects to be equal as the target ratio.

c) First Step is to unlever the beta.
We know that 1.5 = beta of business*(1+0.4(1-0.35)). Therefore, beta of business is 1.19.
The second step is re-lever the beta. So, beta = 1.19*(1+(30/100)(1-0.35)) = 1.42
So, the cost of equity should be 6% +1.42*7.5% = 16.65%
The Wacc for this project is 14%

d) No. The discount rate should match the systematic risk of the project case. In this case, if we used 12.74% instead of 14%, we would get an NPV that would be artificially high and so we could accept project we should reject.

Question 4

a) Value of firm is Vu = 35(1-0.35)/0.2 = 113.65
Price per share = 113.65/1.5 = 75.83

b) Tax shield from debt = 40*0.35 = 14
New value of equity = 113.65 + 14 = 127.65
New price per share = 127.65/1.5 = 85.17

c) Number of shares repurchased = 40,000,000/85.17 = 469,667

d) First we need to calculate the market value of the debt at the new yield to maturity.
B = 40*0.09/0.12 = 30
Then, we need to calculate the new tax shield = 30*.35 = 10.5
So, the levered firm is now only worth 113.65 + 10.5 = 124.15
Since Debt is worth 30, Equity is now worth 94.15.
Since now we have 1,030,333 shares, the new price is 91.48
What happened is that the overall risk of the assets of the firm did not change, only the risk of the bonds increased. Therefore, with the downgrade of the bonds, there was a transfer of risk from the stock into the bonds, leading to reduction of the value of the bonds and an increase of the value of the stock and an increase to the price of the shares.

e) If markets are not semi strong efficient, the prices are not affected by the announcement but only at the repurchase. This means that for part b) prices remain at 75.83 and the number of repurchased will be 527,473. After the repurchase the equity is worth 127.65 – 40 = 87.65. Since now there are only 972,527 shares, the new price is 90.13

Question 5

a) Levered cash flow = (23,000,000*(1-0.6) – 1,057,990)(1-0.40) = 4,885,206
Value of Equity = 4,885,206/0.1916 = 25,496,900

b) By getting rid of all Bonds, the firm becomes unlevered and the appropriate discount rate is r0 instead of rs.
So, the unlevered cash flow is 23,000,000*(1-0.6)(1-0.4) = 5,520,000
R0 is found by using MMII. So 19,16 = r0 + (r0 – rb)0.45(1-0.4).
We need to find the value of rb. Since we know the amount of interest paid, the value of equity and the debt equity ratio, we can get rb. B is worth 25,496,900*0.45 = 11,473,605. And rb is 1,056,990/11,473,605 = 9.22%
So, r0 = 17.047%