LO.a: Calculate and interpret the weighted average cost of capital (WACC) of a company.

1. The following data is available for a company:
   Cost of debt: 9%
   Cost of equity: 12%
   Debt-to-equity ratio (D/E): 100%
   Tax rate: 30%
   The weighted average cost of capital (WACC) is *closest* to:
   A. 6.30%.
   B. 9.00%.
   C. 9.15%.

2. The following information is available for a firm:
   Debt-to-equity ratio: 50%
   Tax rate: 30%
   Cost of debt: 12%
   Cost of equity: 19%,
   The firm's weighted average cost of capital (WACC) is *closest to*:
   A. 14.45%.
   B. 15.47%.
   C. 16.33%.

3. The following information is available for a firm:
   Cost of debt: 11%
   Cost of equity: 15%
   Debt-to-equity ratio (D/E): 50%
   Tax rate: 35%
   The weighted average cost of capital (WACC) is *closest* to:
   A. 10.82%.
   B. 11.08%.
   C. 12.39%.

4. A firm's estimated costs of debt, preferred stock, and common stock are 13%, 17%, and 22%, respectively. Assuming equal funding from each source and a 30% tax rate, the weighted average cost of capital is *closest* to:
   A. 15.45%.
   B. 16.03%.
   C. 17.33%.

5. An analyst gathers the following information about the capital structure and before-tax component costs for a company. The company's marginal tax rate is 35 percent.

Capital component	**Book Value(000)**	**Market Value(000)**	**Component cost**
Debt	€ 120	€ 100	6%
Preferred stock	€ 60	€ 60	9%
Common stock	€ 300	€ 240	13%

The company's weighted average cost is *closest* to:

A. 10.13%.
B. 9.55%.
C. 10.56%.

6. A.F. Company has a debt to equity ratio of 60% and is subject to taxation at a rate of 40%. Its cost of equity is 17% while its cost of debt is 12.5%. A.F. Company's weighted average cost of capital is *closest* to:

A. 11.3%.
B. 13.4%.
C. 14.3%.

7. Golden Giants has the following capital structure which is funded from common stock, preferred stock and debt.

Source	**Amount**	**Cost**
Common Stock	100,000,000	16.0%
Preferred Stock	2,000,000	14.5%
Debt	18,000,000	12.0%
Total	120,000,000	

If the tax rate is 35%, the company's weighted average cost of capital is *closest* to:

A. 14.2%.
B. 14.7%.
C. 15.4%.

8. Pamela Peterson computes the weighted average cost of capital (WACC) for the company Atom International. The information used for computation is as follows:

- Common equity has beta 1.2 while the risk free rate and market premium are 5% and 7% respectively.
- The preferred stock has value of $48 with a dividend worth $6.
- The corporate tax rate is 20%.
- Bonds are issued at par and have a coupon rate of 11%.
- Capital structure is 20% preferred stock, 35% debt and 45% common stock.

Atom International's WACC is *closest* to:

A. 9.1%.
B. 11.6%.
C. 12.4%.

9. An analyst gathers the following data about a company to compute its weighted average cost of capital (WACC).

Before-tax cost of new debt	10 percent
Tax rate	35 percent
D/E	0.6660

Stock price	$30
Next year's dividend	$2.50
Estimated growth rate	6.5 percent

Using the dividend discount model, the company's WACC is *closest* to:

A. 11.50 percent.
B. 12.25 percent.
C. 13.00 percent.

10. Digital Design Corporation has an after-tax cost of debt capital of 7 percent, a cost of preferred stock of 9 percent, a cost of equity capital of 11 percent, and a weighted average cost of capital of 8.5 percent. In raising additional capital, the company intends to maintain its current capital structure. In order to make a capital - budgeting decision for an average risk project, the relevant cost of capital is:
    A. 7 percent.
    B. 8.5 percent.
    C. 11 percent.

LO.b: Describe how taxes affect the cost of capital from different capital sources.

11. A firm with a marginal tax rate of 40% has a weighted average cost of capital of 7.11%. The before-tax cost of debt is 6%, and the before-tax cost of equity is 9%. The weight of equity in the firm's capital structure is *closest* to:
    A. 27%.
    B. 65%.
    C. 89%.

12. Which of the following statements is *most likely* true?
    A. The investment opportunity schedule, for a given company, is upward sloping because as a company invests more in capital projects, the returns from investing keep on increasing.
    B. In order to determine the after-tax cost of debt, the appropriate tax rate to use is the average rate.
    C. The after-tax debt cost, for a given company, is generally less than both the cost of preferred equity and the cost of common equity.

13. Which of the following components of WACC is affected by taxes?
    A. Cost of equity.
    B. Cost of debt.
    C. Cost of preferred shares.

LO.c: Describe the use of target capital structure in estimating WACC and how target capital structure weights may be determined.

14. Gaven Warren at California Investment Advisors wants to estimate the cost of capital for Semiactive Conductors as well as projected cash flows for two of their projects to determine

the effect of these new projects on the value of Semiactive Conductors. Warren has gathered following information on Semiactive Conductors:

	Current ($)	Target ($)
Book Value of Debt	62	62
Market Value of Debt	59	63
Book Value of Shareholder's Equity	78	88
Market Value of Shareholder's Equity	230	240

Weights that should be applied to estimating the cost of debt and equity capital for Semiactive Conductors respectively are:

A. wd = 0.262; we = 0.738
B. wd = 0.208; we = 0.792
C. wd = 0.413; we = 0.587

15. In collecting information to conduct financial analysis on Budweiser's new product line of sparkling water, Simon Hayes found that Budweiser currently has a debt-to-equity ratio of 0.55 and the new product line would be financed with $45 million of debt and $65 million of equity. Hayes has estimated the equity beta and asset beta of comparable companies to determine the valuation impact of the new product line on Budweiser's value. Which of the following statements for calculating the equity beta for this new line of product is *most* accurate?
    A. Using the new debt-to-equity ratio of Budweiser that would result from the additional $45 million debt and $65 million equity is appropriate.
    B. Using the current debt-to-equity ratio of 0.55 is appropriate.
    C. Using the current debt-to-equity ratio of 0.55 is not appropriate, but the debt-to-equity ratio of the new product line i.e. 0.69 is appropriate.

LO.d: Explain how the marginal cost of capital and the investment opportunity schedule are used to determine the optimal capital budget.

16. An optimal capital budget occurs when the marginal cost of capital:
    A. is below the investment opportunity schedule.
    B. is above the project's rate of return.
    C. intersects the investment opportunity schedule.

17. Analyst 1: A company's optimal capital budget occurs at the intersection of the net present value and the internal rate of return profiles.
    Analyst 2: A company's optimal capital budget occurs at the intersection of the marginal cost of capital and the investment opportunity schedule.
    Which analyst's statements is *most likely* correct?
    A. Analyst 1.
    B. Analyst 2.
    C. Neither.

LO.e: Explain the marginal cost of capital's role in determining the net present value of a project.

18. Information about a company is provided below. It is expected that the company will fund its capital budget without issuing any additional shares of common stock:

Source of capital	Capital structure proportion	Marginal after-tax cost
Long-term debt	30%	12%
Preferred stock	5%	15%
Common equity	65%	20%

Net present values of three independent projects:
Storage project: $348
Upgrade project: $0
Production line improvement project: -$231
If no significant size or timing differences exist among the projects and the projects all have the same risk as the company, which project has an internal rate of return that exceeds 17.35 percent?

A. All three projects.
B. Storage project only.
C. Storage project and upgrade project.

19. If we use the company's marginal cost of capital in the calculation of the NPV of a project, we are *least likely* assuming that:

A. the project has the same risk as the average-risk project of the company.
B. no new projects will be undertaken until the current project is completed.
C. the project will have a constant target capital structure throughout its useful life.

LO.f: Calculate and interpret the cost of debt capital using the yield-to-maturity approach and the debt-rating approach.

20. Which of the following is the *least appropriate* method for an external analyst to estimate a company's cost of debt?

A. Yield-to-maturity approach.
B. Bond yield plus risk premium approach.
C. Debt rating approach.

21. If the bond rating approach is used to determine the cost of debt, then:

A. yield is based on the interest coverage ratio.
B. company is rated and the rating can be used to assess the credit default spread of the company's debt.
C. coupon rate is the yield.

22. A company is considering issuing a 5-year option-free, 8 percent coupon bond, paid semi-annually. The bond is expected to sell at 98 percent of par value ($1,000). If the company's marginal tax rate is 35 percent, then the after-tax cost of debt is *closest* to:

A. 8.50%.
B. 5.53%.
C. 6.35%.

23. A company issued $20 million in long-term bonds at par value three years ago with a coupon rate of 10 percent. The company has decided to issue an additional $20 million in bonds and expects the new issue to be priced at par value with a coupon rate of 8 percent. There is no other outstanding debt. The applicable tax rate is 35 percent. The appropriate after-tax cost of debt in order the compute the weighted average cost of capital is *closest* to:
    A. 5.2 percent.
    B. 5.8 percent.
    C. 6.1 percent.

24. ACME Minerals has determined that it could issue at $750 a seven-year maturity bond that pays 9.5% coupon semi-annually with a face value of $1000. If the marginal tax rate applicable in the company is 30%, its after-tax cost of debt will *most likely* be:
    A. 5.4 percent.
    B. 10.8 percent.
    C. 12.7 percent.

25. Which of the following statements describe matrix pricing *most accurately?* Matrix pricing:
    A. is used to calculate the coupon rate of a bond.
    B. helps to determine the equity risk premium in the market.
    C. is used in pricing bonds through the debt-rating approach.

LO.g: Calculate and interpret the cost of noncallable, nonconvertible preferred stock.

26. A company's $100 par value preferred stock with a dividend rate of 15.0% per year is currently priced at $105.85 per share. The company's earnings are expected to grow at an annual rate of 3% for the foreseeable future. The cost of the company's preferred stock is *closest* to*:*
    A. 12.9%.
    B. 13.5%.
    C. 14.2%.

27. RBS Insurance Limited issued to retail investors a fixed-rate perpetual preferred stock four years ago at par value of $10 per share with a $2.85 dividend. If the company had issued the preferred stock today, the yield would be 8.5 percent. The current value of the stock is:
    A. $10.00.
    B. $33.53.
    C. $43.85.

28. MTI issued a noncallable, nonconvertible, fixed rate perpetual preferred stock five years ago. The stock was issued at $15 per share with a $1.25 dividend. If the company were to issue preferred stock today, the yield would be 8.75 percent. The stock's current value is *closest* to:
    A. $13.26.
    B. $15.00.
    C. $14.29.

LO.h: Calculate and interpret the cost of equity capital using the capital asset pricing model approach, the dividend discount model approach, and the bond-yield-plus risk-premium approach.

29. The cost of equity capital is equal to the:
    A. rate of return required by stockholders.
    B. cost of retained earnings minus dividend yield.
    C. expected market return.

30. Using the dividend discount model, the cost of equity capital for a company which will pay a dividend of £2.00 next year, has a payout ratio of 35 percent, a return on equity (ROE) of 15 percent, and current stock price of £40, is:
    A. 10.51 percent.
    B. 12.25 percent.
    C. 14.75 percent.

31. The following information is available for a firm:
    Bonds are priced at par and they have an annual coupon rate of 10.3%
    Preferred stock is priced at $15.80 and it pays an annual dividend of $2.2
    Common equity has a beta of 1.1
    The risk-free rate is 3% and the market premium is 12%
    Capital structure: Debt = 35%; Preferred stock = 15%; Common equity = 50%
    The tax rate is 40%
    The weighted average cost of capital (WACC) for the company is *closest* to:
    A. 11.40.
    B. 12.35.
    C. 13.33.

32. A company wants to determine the cost of equity to use in calculating its weighted average cost of capital. The controller has gathered the following information:
    Rate of return on 3-month Treasury bills: 2.0%
    Rate of return on 10-year Treasury bonds: 2.4%
    Market equity risk premium: 4.0%
    The company's estimated beta: 1.2
    The company's after-tax cost of debt: 7.0%
    Risk premium of equity over debt: 3.0%
    Corporate tax rate: 30%
    Using the capital asset pricing model (CAPM) approach, the cost of equity (%) for the company is *closest* to:
    A. 6.8.
    B. 7.2.
    C. 7.9.

33. An analyst gathers the following information about a company and the market:

Current market price per share of common stock	C$45.00
The next dividend that the company will	C$2.50

pay per share on common stock	
Expected dividend payout rate	30%
Expected return on equity (ROE)	12%
Beta for common stock	1.2
Expected return on the market portfolio	9%
Risk free rate	3%

Using the dividend discount model approach, the cost of common equity for the company is *closest* to:

A. 10.20%.
B. 13.96%.
C. 12.50%.

34. An analyst has collected following information about a company and the market:

Current market price per share of common stock	$17.00
Latest dividend (D_0) paid on common stock	$ 1.50
Expected dividend payout rate	80%
Expected return on equity (ROE)	17%
Beta	0.75
Expected rate of return on market portfolio	15%
Risk-free rate of return	5.25%

According to the dividend discount model (DDM), the cost of retained earnings for the company is *closest* to:

A. 12.2 percent.
B. 11.9 percent.
C. 12.5 percent.

35. An analyst has collected following information about a company and the market:

Current market price per share of common stock	$17.00
Latest dividend (D_0) paid on common stock	$ 1.50
Expected dividend payout rate	80%
Expected return on equity (ROE)	17%
Beta	0.75
Expected rate of return on market portfolio	15%
Risk-free rate of return	5.25%

According to the Capital Asset Pricing Model (CAPM) approach, the cost of retained earnings for the company is *closest* to:

A. 12.6 percent.
B. 12.2 percent.
C. 13.2 percent.

LO.i: Calculate and interpret the beta and cost of capital for a project.

36. The average levered and average unlevered betas for the group of comparable companies of a private subcontractor of autoparts, are 1.5 and 1.01 respectively. The debt-equity ratio is 1.3 and corporate tax rate is 40%. The estimated beta for the private subcontractor is *closest* to:

A. 1.978.
B. 1.698.
C. 1.798.

37. A company has an equity beta of 1.2 and is 70% funded with debt. Assuming a tax rate of 30%, the company's asset beta is *closest* to:
    A. 0.46.
    B. 0.63.
    C. 0.71.

38. A company has an equity beta of 1.4. If the tax rate is 40%, and debt-to-equity ratio is 0.5, the asset beta is *closest* to:
    A. 1.08.
    B. 1.4.
    C. 1.96.

39. Kyushu Motors has historically maintained a long-term stable debt-to-equity ratio of 0.60. To finance expansion plans in Africa, recent bank borrowing raised this ratio to 0.75. The *most likely* effect of this increased leverage on the asset beta and equity beta of the company is that:
    A. the asset beta will rise and the equity beta will also rise.
    B. the asset beta will remain the same and the equity beta will rise.
    C. the asset beta will decline and the equity beta will also decline.

40. Cyndi collects data related to a company called Dinah Ltd. The asset beta of the company equals 0.64 while the equity beta is 1.80. Given that the tax rate is 40%, the percentage of capital funded by debt is *closest* to:
    A. 30%.
    B. 75%.
    C. 80%.

41. Morgan Private Limited currently has 1.5 million common shares of stock outstanding and the stock has a beta of 1.5. It also has a $9 million face value of bonds that have seven years remaining to maturity and 8 percent coupon with semi-annual payments, and are priced to yield 15.00 percent. If Morgan issues up to $2.0 million of new bonds, the bonds will be priced at par and have a yield of 15.00 percent; if it issues bonds beyond $2.0 million, the expected yield on the entire issuance will be 18 percent. Morgan has learned that it can issue new common stock at $10 a share. The current risk-free rate of interest is 5 percent and the expected market return is 12 percent. Morgan's marginal tax rate is 35 percent. If Morgan raises $7.5 million of new capital while maintaining the same debt-to-equity ratio, its weighted average cost of capital is be *closest* to:
    A. 10.2 percent.
    B. 12.2 percent.
    C. 14.4 percent.

The following information is related to Questions 42-45

David Burke, CFA, an investment banking analyst at Fundamental Analytics is working on initial public offering of a UK based small-cap mobile phone software development company, TagHere. For the previous three years, the industry has grown at a rate of 26 percent per year. The industry is dominated by large players, but comparable "pure-play" companies such as Galicia Ltd., Venus Inc., and ImPro Software Pvt. Ltd. also exist. Although each of these companies has their shares of stock traded on the London Stock Exchange, each one is domiciled in a different country. The debt ratio of the industry has risen slightly in recent years.

Company	**Sales in Millions (£)**	**Market Value Equity in Millions (£)**	**Market Value Debt in Millions (£)**	**Equity Beta**	**Tax Rate**	**Share Price (£)**
Galicia Ltd.	843	2,150	6.5	2.450	25 percent	15
Venus Inc.	211	910	13.0	4.123	25 percent	27
ImPro Software Pvt. Ltd.	752	4,315	0.0	1.514	25 percent	12

Burke uses the information from the information memorandum for TagHere's initial offering. The company intends to issue 1 million new shares. While finalizing the price of the deal, it was concluded that the offering price will be between £5 and £10. The current capital structure of TagHere consists of a £3.6 million five-year non-callable bond issue and 2 million common shares. Other information is given below:

Currently outstanding bonds	£3.6 million five-year bonds, coupon of 10.5 percent, with a market value of £3.234 million
Risk-free interest rate	4.35 percent
Estimated equity risk premium	5 percent
Tax rate	25 percent

42. The asset betas for Galicia Ltd., Venus Inc., and ImPro Software Pvt. Ltd., respectively, are:
    A. 2.44, 4.08 and 1.51.
    B. 1.56, 2.76 and 4.77.
    C. 2.44, 3.12 and 4.08.

43. The average asset beta for the pure players in this industry Galicia Ltd., Venus Inc., and ImPro Software Pvt. Ltd., weighted by market value of equity is *closest* to:
    A. 1.19.
    B. 2.10.
    C. 2.26.

44. Using the CAPM model, the cost of equity capital for a company in this industry with a debt-to-equity ratio of 0.03, asset beta of 3.14 and a marginal tax rate of 25 percent is *closest* to:
    A. 22.41 percent.
    B. 20.36 percent.
    C. 20.40 percent.

45. The marginal cost of capital for TagHere, based on an average asset beta of 3.14 for the industry and assuming that new stock can be issued at £7 per share, is *closest* to:
    A. 20.1 percent.
    B. 20.3 percent.
    C. 21.3 percent.

46. An analyst has collected following information about a private company and its publicly traded competitor:

Comparable Companies	Tax Rate (%)	Debt/Equity	Equity Beta
Private company	35.0	0.90	N.A.
Public company	30.0	0.70	1.15

Using the pure-play method, the estimated equity beta for the private company is *closest* to:
    A. 2.221.
    B. 3.221.
    C. 1.223.

LO.j: Describe uses of country risk premiums in estimating the cost of equity.

47. A developing country's equity premium *least likely* includes:
    A. sovereign yield spread.
    B. annualized standard deviation of the sovereign bond markets in terms of the developing country's currency.
    C. annualized standard deviation of the developing country's equity index.

48. An analyst has gathered the following information about the capital markets in the U.S. and in Montila, a developing country.

Selected Market Information (%)	
Yield on U.S. 10-year Treasury bond	6.5
Yield on Montila, 10-year government bond	12.5
Annualized standard deviation of Montila stock index	40.0
Annualized standard deviation of Montila dollar-denominated government bond	25.0

Based on the analyst's data, the estimated country equity premium for Montila is *closest* to:
    A. 8.41%.
    B. 9.60%.
    C. 10.40%.

The following information related to Questions 49-54

Shawn Miller, CFA, is a buy-side analyst for a foundation managing a global large-cap fund. He has hired the services of a telecommunications industry expert, Phillipa Jenkens. Miller is analyzing one of the fund's largest holdings, a mobile phone manufacturer Satellite QS operating globally in 50 countries with historical global revenues of $12.4 billion. Recently, Satellite's management announced expansion plans for a greenfield investment in Indonesia. Miller is concerned about the implications of the expansion plans on Satellite's risk profile and is wondering whether he should issue a 'sell' recommendation on the fund holding.

Miller provides Jenkens with basic company information. Satellite's global annual free cash flow to the firm is $700 million, which is expected to level off at a 3.5 percent growth rate and earnings are $550 million. Miller estimates that Satellite's after-tax free cash flows to the firm on the Indonesia project for the next four years are $60 million, $64 million, $67.5 million and $70.4 million. The company has just recently announced a dividend of $2.5 per share of stock. To keep the analysis simple, Miller asks Jenkens to ignore any possible exchange rate fluctuations. For the first four years, the Indonesian plant is expected to serve Indonesian customers only. Jenkens has been assigned to evaluate Satellite's financing plans of $130 million with a $97.50 million public offering of 8-year debt in the US and the remainder to be financed by means of equity offering.

Additional information:

Equity risk premium, US	3.20 percent
Risk-free rate of interest, US	1.50 percent
Industry debt-to-equity ratio	0.45
Market value of Satellite's debt	$750 million
Market value of Satellite's equity	$3.2 billion
Satellite's equity beta	1.05
Satellite's before-tax cost of debt	5.25 percent
Indonesia credit A2 country risk premium	4.58 percent
Corporate tax rate	35 percent
Interest payments each year	Level

49. Satellite's cost of equity capital for a typical project using the capital asset pricing model is *closest* to:
    A. 2.94 percent.
    B. 4.59 percent.
    C. 4.86 percent.

50. The weighted average cost of capital of Satellite QS prior to investing in Indonesia is *closest* to:
    A. 2.94 percent.
    B. 4.59 percent.
    C. 4.86 percent.

51. In estimating the project's cost of capital, the estimated asset beta of Satellite QS prior to investing in Indonesia is *closest* to:
    A. 0.911.
    B. 0.915.
    C. 1.302.

52. Miller wants to conduct sensitivity analysis for the effect of the new project on the company's cost of capital. The estimated project beta for Indonesia project if it is financed with 75% with debt and has the same asset risk as Satellite, is *closest* to:

A. 3.841.
B. 2.699.
C. 2.688.

53. The cost of equity capital for the Indonesia project considering that this project requires to capture the country risk premium, that would form part of the sensitivity analysis that Miller wants to conduct for the effect of the new project on the company's cost of capital, is *closest* to:
    A. 22.41 percent.
    B. 23.17 percent.
    C. 26.87 percent.

54. In the final presentation to the senior fund manager, Miller wants to discuss the sensitivity of the project's NPV to the estimation of the cost of equity. The Indonesia project's NPV calculated without the country risk premium and with the country risk premium are, respectively:
    A. $95 million and $73 million.
    B. $101 million and $85 million.
    C. $101 million and $73 million.

LO.k: Describe the marginal cost of capital schedule, explain why it may be upward-sloping with respect to additional capital, and calculate and interpret its break-points.

55. An analyst gathers the following information about the cost and availability of raising various amounts of new debt and equity capital for a company:

Amount of new debt (in millions)	Cost of debt (After tax)	Cost of new equity (in millions)	Cost of equity
≤ $5.0	3%	≤ $6.0	12%
> $5.0	5%	>$6.0	14%

The company's target capital structure is 65% equity and 35% debt. If the company raises $12.5 million in new financing, the marginal cost of capital is *closest to*:
    A. 9.8%.
    B. 11%.
    C. 10.15%.

56. Which of the following is *least likely* a reason for why the marginal cost of capital of a company rises as additional funds are raised?
    A. Debt covenants restrict the company from issuing senior debt and consequently it issues subordinate debt.
    B. The company deviates from its target capital structure.
    C. The company issues additional equity at a time when the cost of equity is significantly lower than historical levels; it also issues additional debt to maintain the overall debt/equity ratio at an optimal level.

LO.l: Explain and demonstrate the correct treatment of flotation costs.

57. Scott Harris, a financial planner for a manufacturing corporation, wants to account for the floatation costs in his capital budgeting. The *most appropriate* treatment of floatation costs is to:
    A. expense in the current period.
    B. incorporate into the estimated cost of capital.
    C. deduct as one of the project's initial-period cash flows.

58. Analyst 1: Using the adjustment for the flotation costs in the cost of capital may be useful if specific project financing cannot be identified.
    Analyst 2: By adjusting the cost of capital for the flotation costs, it is easier to demonstrate how costs of financing a company change as a company exhausts internally generated equity (i.e., retained earnings) and switches to externally generated equity.
    Which analyst's statements is (are) *most likely* correct?
    A. Analyst 1.
    B. Analyst 2.
    C. Both.

Solutions

1. C is correct. $w_d = \frac{\frac{D}{E}}{1+\frac{D}{E}} = \frac{1}{1+1} = 50\%$
   $w_e = 1 - w_d = 50\%$
   $WACC = w_d r_{d(1-t)} + w_e r_e$
   $WACC = 50\% * 9\% * (1 - 30\%) + 50\% * 12\% = 9.15\%$

2. B is correct. $w_d = \frac{\frac{D}{E}}{1+\frac{D}{E}} = \frac{0.5}{1+0.5} = 33.3\%$
   $w_e = 1 - w_d = 66.7\%$
   $WACC = w_d r_{d(1-t)} + w_e r_e$
   $WACC = 33.3\% * 12\% * (1 - 30\%) + 66.7\% * 19\% = 15.47\%$

3. C is correct. $w_d = \frac{\frac{D}{E}}{1+\frac{D}{E}} = \frac{0.5}{1+0.5} = 33.3\%$
   w_e= 1 - = 66.7%
   $w_e = 1 - w_d = 66.7\%$
   $WACC = w_d r_{d(1-t)} + w_e r_e$
   $WACC = 33.3\% * 11\% * (1 - 35\%) + 66.7\% * 15\% = 12.39\%$

4. B is correct. $WACC = w_d r_d (1-t) + w_p r_p + w_e r_e = \frac{[0.13*(1-0.30)+0.17+0.22]}{3} = 16.03\%$.

5. A is correct. The company's weighted average cost WACC is equal to:
   $WACC = w_d r_d (1-t) + w_p r_p + w_e r_e$
   The target capital structure is:
   Market value of equity = $\frac{240}{400} = 60\%$
   Market value of debt = $\frac{100}{400} = 25\%$
   Market value of preferred stock = $\frac{60}{400} = 15\%$
   $r_d(1-t) = 6\% (1 - 35\%) = 3.90\%$
   $r_e = 13\%$
   $r_p = 9\%$
   $WACC = 0.25 * 3.9\% + 0.15 * 9\% + 0.60 * 13\% = 10.13\%$

6. B is correct. $w_d = \frac{\frac{D}{E}}{1+\frac{D}{E}} = \frac{0.6}{1+0.6} = 0.375$
   $w_e = 1 - w_d = 1 - 0.375 = 0.625$
   $WACC = w_d r_{d(1-t)} + w_e r_e = (0.375 * 0.125 * (1 - 0.4)) + (0.625 * 0.17)$
   = 13.44%

7. B is correct. $WACC = w_d r_d (1-t) + w_p r_p + w_e r_e$

$= [\left(\frac{18}{120}\right) * 0.12 * (1 - 0.35)] + [\left(\frac{2}{120}\right) * 0.145] + [\left(\frac{100}{120}\right) * 0.16]$
$= 14.745\%$

8. B is correct. WACC = $w_d r_d (1 - t) + w_p r_p + w_e r_e$

   $r_e =$ Risk free rate $+ \beta$ (Market risk premium)
   $r_e = 5 + 1.2(7) = 13.4\%$
   $r_d =$ Debt rate $(1 -$ tax rate$)$
   $r_d = 11\ (1 - 0.2) = 8.8\%$
   $r_p = \frac{\text{Dividend}}{\text{Price}} = \frac{6}{48} = 12.5\%$
   $\text{WACC} = .134 * 0.45 + .088 * 0.35 + .125 * 0.20$
   WACC = 11.6%

9. A is correct. Cost of equity = $\left(\frac{D_1}{P_0}\right) + g = \left(\frac{\$2.50}{\$30}\right) + .065 = 8.3\% + 6.5\% = 14.8\%$
   $w_d = \frac{D/E}{D/E + 1} = \frac{0.6660}{1.6660} = 0.40$
   $\text{WACC} = [(0.40)\ (0.10)\ (1 - 0.35)] + [(0.60)(0.148)] = 11.5\%$

10. B is correct. The best estimate of cost of capital for an average-risk project of a company is the weighted average cost of capital using weights derived from the current capital structure.

11. B is correct. Taxes affect cost of debt only, since interest is tax deductible.
    $\text{WACC} = w_d\ r_d\ (1 - t) + w_e\ r_e$, where $w_d + w_e = 1$
    $7.11 = (1 - w_e) * 6 * (1 - 0.4) + w_e * 9$
    $w_e = 65\%$

12. C is correct. Generally, debt is less costly than both preferred and common stock. If interest expense is tax deductible, then the cost of debt is further reduced.

13. B is correct. Interest is tax deductible and it provides tax savings which lowers the cost of debt.

14. B is correct. Use the market values of debt and equity to calculate their weights.
    $w_d = \frac{\$63}{\$63 + \$240} = 0.208$
    $w_e = \frac{\$240}{\$63 + \$240} = 0.792$

15. C is correct. When making adjustments from the asset beta, derived from the comparables, to calculate the equity beta of the new product, the correct approach is to use the debt-to-equity ratio of the new product line.

16. C is correct. An optimal capital budget occurs when the marginal cost of capital intersects the investment opportunity schedule.

17. B is correct. The point at which the marginal cost of capital intersects the investment opportunity schedule is the optimal capital budget.

18. B is correct.
The WACC of the company is calculated as follows:
$0.3(12\%) + 0.05(15\%) + 0.65(20\%) = 17.35\%$. To have a positive NPV, a project must have an IRR greater than the WACC used to calculate the NPV. Only the storage project has a NPV greater than \$0 (at the company's WACC of 17.35%), therefore only the storage project has an IRR that exceeds 17.35%.

19. B is correct. Statement B is not an assumption we make when using the company's marginal cost of capital to calculate the NPV of a project.

20. B is correct. Bond yield plus risk premium is used to calculate cost of equity not cost of debt. The other two are approaches to calculate cost of debt.

21. B is correct. The bond rating approach depends on knowledge of the company's rating and can be compared with yields on bonds in the public market.

22. B is correct. Using the financial calculator, determine the yield.
N = 10, PV = -980, PMT = 80/2 = 40, FV = 1000, CPT I/Y = 4.25 semi-annual
Annual yield = 4.25 * 2 = 8.50 before tax
After-tax cost of debt: 8.50% (1 – 35%) = 5.525~ 5.53%

23. A is correct. The appropriate cost is the marginal cost of debt. The before-tax cost of debt can be calculated by the yield to maturity on a comparable outstanding. After adjusting for tax, the after-tax cost of debt is 8(1 – 0.35) = 8(0.65) = 5.2%.

24. B is correct.
FV = \$1000; PMT = \$47.5;; N = 14; PV = \$750, CPT I/Y
I/Y = 7.7361%; YTM = $7.7361\% * 2 = 15.47220\%$
After-tax cost of debt: $r_d(1 - t) = 15.47220\%(1 - 0.30) = 10.8305\%$

25. C is correct. Debt-rating approach which is used to estimate the before-tax cost of debt is an example of the matrix pricing method. Matrix pricing method involves pricing on the basis of valuation-relevant characteristics.

26. C is correct. $r_p = \frac{D_p}{P_p}$ (or Dividend / Price) = $\frac{\$100 * 0.15}{\$105.85}$ = 14.17%

27. B is correct. The company can issue preferred stock today at 8.5%.
$P_p = \frac{\$2.85}{0.085} = \$33.53$

28. C is correct. Value of preferred stock = $P_p = \frac{D_p}{r_p}$

$$P = \frac{1.25}{.0875} = \$14.29$$

29. A is correct. The cost of equity capital is the rate of return required by stockholders.

30. C is correct. Using the sustainable growth calculation, the growth rate is calculated as:

$g = (1 - \text{Dividend payout ratio})(\text{Return on Equity}) = (1 - 0.35)(15\%) = 9.8\%$

$r_e = \left(\frac{D_1}{P_0}\right) + g = \left(\frac{\$2.00}{\$40}\right) + 9.80\% = 14.75\%$

31. B is correct. r_d = 10.3%, the yield to maturity on a par value bond is the coupon rate of the bond.

$r_p = \frac{D_p}{P_p} = \frac{2.2}{15.8} = 13.9\%$

$r_e = RF + [(RM) - RF] = 3\% + 1.1[12\%] = 16.2\%$

$WACC = w_d r_d(1 - t) + w_p r_p + w_e r_e$

$= 35\% * 10.3\% * (1 - 40\%) + 15\% * 13.9\% + 50\% * 16.2\% = 12.35\%$

32. B is correct. The cost of equity using CAPM:
Cost of equity = 2.4 + 1.2 * (4.0) = 7.2%.

33. B is correct. Using the DDM cost of common equity= dividend yield + growth = $\frac{D_1}{P} + g$
Growth = Retention rate * ROE = (1-payout) * ROE = $(1 - 0.30) * 12\% = 8.40\%$
Dividend yield = $\frac{2.50}{45.00}$ =5.56%
Hence cost of common equity = 5.56% + 8.40% = 13.96%

34. C is correct.
Expected return = expected dividend yield + expected growth = $\frac{D_1}{P} + g$
Expected growth = $(1 - 0.80)17\%$ = 3.4%.
Expected dividend yield = $\frac{1.5 * 1.034}{17} = 0.091 = 9.1\%$.
Expected return = 3.4% + 9.1% = 12.5%.

35. A is correct. Using the CAPM method, 5.25% + 0.75 (9.75%) = 12.56%.

36. C is correct.

Estimated beta = $1.01[1 + (1.3)(1 - 40\%)] = 1.798$.

37. A is correct. Note: 70% debt financing is equivalent to a D/E ratio of 2.33 = $\frac{0.70}{1 - 0.70}$.

$$ß_A = ß_E * \left[\frac{1}{1+\frac{[1-t]D}{E}}\right] = \frac{1.2}{1+(1-0.30)*2.33} = 0.46.$$

38. A is correct. $\beta_E = \beta_A * \left[1 + (1 - t) * \frac{D}{E}\right]$
$1.4 = \beta_A [1 + (1 - 0.4) * 0.5]$
$1.4 = \beta_A * [1 + 0.6 * 0.5]$
$1.4 = \beta_A * 1.3$
$\beta_A = 1.08$

39. B is correct. Asset risk does not change with a higher debt-to-equity ratio. Equity risk rises with higher debt.

40. B is correct. $\beta_E = \beta_A * \left[1 + (1 - t) * \frac{D}{E}\right]$
$1.8 = 0.64 \left[1 + (1 - 0.4)\left(\frac{D}{E}\right)\right]$
$\frac{D}{E} = 3.02$
% of debt = $\frac{3.02}{3.02+1} = 75\%$

41. C is correct. The steps to determine WACC are outlined below:
- First calculate the market value of debt
FV = $9,000,000, PMT = $360,000, N = 14, I/Y = 7.50%, CPT PV. PV = $ 6,325,917.
- Calculate the market value of equity. 1.5 million shares outstanding at $10 = $15,000,000
- Calculate the weights of debt and equity in the capital structure.

Market value of debt	$6,325,917	30%
Market value of equity	15,000,000	70%
Total capital	$21,325,917	100%

- Calculate the before-tax cost of debt. To raise $7.5 million of new capital while maintaining the same capital structure, the company would issue $7.5 million * 30% = $2.25 million in bonds, which results in a before-tax rate of 18 percent.
- Calculate WACC:
$r_d (1 - t) = 0.18(1 - 0.35) = 0.117$ or 11.7%
$r_e = 0.05 + 1.5 (0.12 - 0.05) = 0.155$ or 15.5%
WACC = $[0.30(0.117)] + [0.70(0.155)] = 0.0351 + 0.1085 = 0.1436$ or 14.36%

42. A is correct. Asset betas = $\frac{\beta_{equity}}{\left[1+(1-t)\left(\frac{D}{E}\right)\right]}$
Galicia: $\frac{2.450}{[1+(1-0.25)(0.003)]} = 2.444$
Venus: $\frac{4.123}{[1+(1-0.25)(0.014)]} = 4.079$

ImPro: $\frac{1.514}{[1+(1-0.25)(0)]} = 1.5140$

43. B is correct.
Weights are calculated using relative market values:

Pure-Play	Market Value of Equity in Millions	Proportion of Total
Galicia	£2,150	0.2915
Venus	910	0.1234
ImPro	4,315	0.5851
Total	£7,375	1.000

Weighted average beta (0.2915) (2.444) + (0.1234) (4.079) + (0.5851) (1.5140) = 2.10.

44. C is correct.
Asset beta = 3.14
Levered beta = $3.14\left(1+\left[(1-0.25)(0.03)\right]\right) = 3.2107$
Cost of equity capital = 0.0435 + (3.2107) (0.05) = 0.2040 or 20.40%

45. B is correct.
For debt: FV = 3,600,000; PV = - 3,234,000; N = 10; PMT = 189,000, CPT I/Y. I/Y = 0.06676. YTM = Before-tax cost of debt = 13.4%
Market value of equity = 2 million shares outstanding + 1 million newly issued shares = 3 million shares at £7 = £21 million
Total market capitalization = £3.234 million + £21 million = £24.234 million
Levered beta = $3.14\left[1+\left[(1-0.25)\left(\frac{3.234}{21}\right)\right]\right] = 3.5027$
Cost of equity = $0.0435 + (3.5027)(0.05) = 0.2186$ or 21.86%
Debt weight = $\frac{£3.234}{£24.234} = 0.1334$
Equity weight = £21/£24.234 = 0.8666
TagHere's MCC = $[(0.1334)(0.134)(1-0.25)] + [(0.8666)(0.2186)] = 0.01336 + 0.18946 = 0.20282$ or 20.28%

46. C is correct. The asset (unlevered) beta for the public company is calculated as follows:
$\frac{1.15}{[1+(1-0.30)(0.70)]} = 0.772$.
Now calculating the levered beta for the private firm using its target debt ratio:

$$0.772 * [1+(1-0.35)(0.90)]$$

= 1.223.

47. B is correct. The annualized standard deviation of the sovereign bond market in terms of the developing country's currency is not part of the equity premium calculation.

$$\text{Country equity risk premium} = \text{Sovereign yield spread} * \frac{\text{annualized standard deviation of equity index}}{\text{annualized standard deviation of the sovereign bond market in terms of the developed market currrency}}$$

48. B is correct. The country equity premium can be estimated as the sovereign yield spread times the volatility of the country's stock market relative to its bond market.
Montila's equity premium = $(0.125 - 0.065)\left(\frac{0.4}{.25}\right)$= 6% * 1.6 = 9.60%

49. C is correct. r_e = 0.0150 + (1.05) (0.0320) = 0.0486 or 4.86%

50. B is correct.
WACC = $\left[\left(\frac{\$750}{\$3{,}950}\right)(0.0525)(1 - 0.35)\right] + \left[\left(\frac{\$3{,}200}{\$3{,}950}\right)(0.0486)\right]$ = 0.0459 or 4.59%

51. A is correct. Asset beta = Unlevered beta = $\frac{1.05}{1+\left[(1-0.35)\left(\frac{\$750}{\$3{,}200}\right)\right]}$ = 0.911

52. C is correct. Project beta = $0.911\left[1 + \left[(1 - 0.35)\left(\frac{\$97.5}{\$32.5}\right)\right]\right]$ = 0.911 {2.96} = 2.688

53. A is correct. r_e = 0.0150 + 2.688(0.0320 + 0.0458) = 0.2241 or 22.41%

54. B is correct.
Cost of equity without the country risk premium:
$r_e = 0.0150 + 2.688(0.0320) = 0.1010$ or 10.10%
Cost of equity with the country risk premium:
$r_e = 0.0150 + 2.688(0.0320 + 0.0458) = 0.2241$ or 22.41%
Weighted average cost of capital without the country premium:
WACC = [0.75(0.0525) (1 – 0.35)] + [0.25(0.1010)] = 0.0508 or 5.08%
Weighted average cost of capital with the country premium:
WACC = [0.75(0.0525) (1 – 0.35)] + [0.25(0.2241)] = 0.0816 or 8.16%

NPV without the country risk premium:
Enter the following values in a financial calculator to calculate the NPV:
CF0 = -130, CF1 = 60, CF2=64, CF3=67.5, CF4 = 70.4, I = 5.08, CPT NPV; NPV = 100.97

NPV with the country risk premium:
Enter the following values in a financial calculator to calculate the NPV:
CF0 = -130, CF1 = 60, CF2=64, CF3=67.5, CF4 = 70.4, I = 8.16, CPT NPV; NPV = 84.96

55. C is correct. As a company raises more funds, the costs of different sources of capital may change, resulting in a change in the weighted average cost of capital.
$WACC = w_d(1 - t)r_d + w_p r_p + w_e r_e$

The target capital structure is:
Equity = 65%
Debt = 35%
New financing $12.5 million
65% of 12.5 m = $8.125 million
35% of 12.5 m = $ 4.375 million
$r_d(1 – t) = 3\%$; $r_e = 14\%$
Hence WACC = 0.35 * 3% + 0.65 * 14% = 10.15%.

56. C is correct. Issuing subordinate debt will cause the cost of debt and hence the cost of capital to increase. If a company deviates from its target capital structure it is likely that the cost of capital will rise. If the company issues additional equity when the cost of equity is relatively low, this is likely to reduce the cost of capital as long as the company maintains its capital structure.

57. C is correct. Floatation costs are an additional cost of the project and should be incorporated as an adjustment to the initial-period cash flows in the valuation computation.

58. C is correct. Both statements on why we see the adjustment of floatation costs in the cost of capital instead of the net present value calculation are correct.