

A. MULTIPLE CHOICE QUESTIONS (30%)

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

8	A
9	C
10	D
11	C
12	C
13	C
14	B

15	B
16	B
17	B
18	C
19	B
20	C

B. Exercises (Show your calculations)

Exercise # 1 (20%)

Compute the following ratios:

- (a) Current ratio
- (b) Quick ratio
- (c) Inventory turnover
- (d) Average age of inventory (Days sales in Inventory)
- (e) Debt-equity ratio
- (f) Earnings per share (EPS)
- (g) Common Dividends per share (DPS)
- (h) Common Dividend payout ratio (DPR)

$$\text{a- Current ratio} = \frac{\text{Current Assets } \$600,000}{\text{Current Liabilities } \$200,000} = 3$$

$$\text{b- Quick ratio} = \frac{\text{Cash + marketable securities } \$300,000}{\text{Current Liabilities } \$200,000} = 1.5$$

$$\text{c- Inventory turnover} = \frac{\text{Cost of goods sold } \$600,000}{\text{Average inventory } (\$250,000 + \$300,000) / 2} = 21.82$$

$$\text{d- Average age of inventory} = \frac{365}{\text{Inventory turnover } 21.82} = 16.7 \text{ days}$$

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$$\text{e- Debt-equity ratio} = \frac{\text{Total liabilities } \$300,000}{\text{Stockholders' equity } \$800,000} = 0.375$$

$$\text{f- Earnings per share} = \frac{\text{Net income } \$1,500,000}{\text{Outstanding common shares } 100,000 \text{ shares}} = \$15$$

$$\text{g- Common Dividends per share} = \frac{\text{Dividends } \$600,000}{\text{Outstanding shares } 100,000 \text{ shares}} = \$6$$

$$\text{h- Common Dividend payout ratio} = \frac{\text{Dividends per share } \$6}{\text{Earnings per share } \$15} = 0.4$$

Exercise # 2 (16%)

1. Compute the company's break-even point in both units and sales dollars. Use the equation method.
2. Assume that sales increase by \$400,000 next year. If cost behavior patterns remain unchanged, by how much will the company's net operating income increase?
3. Refer to the original data. Assume that next year management wants the company to earn a profit of at least \$90,000. How many units will have to be sold to meet this target profit?
4. Refer to the original data. Compute the company's margin of safety in both dollar and percentage form.
5.
 - a. Compute the company's degree of operating leverage at the present level of sales.
 - b. Assume that through a more intense effort by the sales staff, the company's sales increase by 8% next year. By what percentage would you expect net operating income to increase?

1. Profit = Unit CM × Q – Fixed expenses
 $\$0 = (\$60 - \$45) \times Q - \$240,000$
 $\$15 Q = \$240,000$
 $Q = \$240,000 / \15
 $Q = 16,000 \text{ units; or at } \$60 \text{ per unit. } \$960,000$

2. CM ratio = $\frac{\text{Unit contribution margin}}{\text{Unit selling price}} = \frac{\$15}{\$60} = 25\%$
 Increase in sales × CM ratio = Expected increase in contribution margin
 $\$400,000 \times 25\% = \$100,000$

Because the fixed expenses are not expected to change, net operating income will increase by the entire \$100,000 in contribution margin computed above.

3. Profit = Unit CM × Q – Fixed expenses

$$\$90,000 = (\$60 - \$45) \times Q - \$240,000$$

$$\$15Q = \$90,000 + \$240,000$$

$$Q = \frac{\$330,000}{\$15}$$

$$Q = 22,000 \text{ UNITS}$$

Formula method:

$$\begin{aligned} \text{Unit sales to attain the target profit} &= \frac{\text{Target profit} + \text{Fixed expenses}}{\text{Contribution margin per unit}} = \frac{\$90,000 + \$240,000}{\$15 \text{ per unit}} \\ &= 22,000 \text{ units} \end{aligned}$$

4. Margin of safety in dollars = Total sales – Break-even sales

$$= \$1,200,000 - \$960,000 = \$240,000$$

$$\text{Margin of safety percentage} = \frac{\text{Margin of safety in dollars}}{\text{Total sales}} = \frac{\$240,000}{\$1,200,000} = 20\%$$

- 5.

a. Degree of operating leverage = $\frac{\text{Contribution margin}}{\text{Net operating income}} = \frac{\$300,000}{\$60,000} = 5$

- b. Expected increase in sales × Degree of operating leverage = Expected increase in net operating income

$$8\% \times 5 = 40\%$$

Exercise # 4 (14%)

Calculate each required WACC component. Round dollar amounts to the nearest dollar and percentages to one decimal place:

- a. Cost of retained earnings
- b. Cost of preferred stock
- c. After-tax cost of debt
- d. Total market value of common stock
- e. Total market value of preferred stock
- f. Total market value of bonds
- g. Weighted average cost of capital

Cost of retained earnings

Using the dividend growth (discounted cash flow) model:

$$\text{Cost of retained earnings} = D_1 / P_0 + g$$

$$\text{Where } D_1 = D_0 \times (1 + g)$$

$$[(\$0.363 \times 1.041) / \$4.70] + 0.041 = 12.1\%$$

Cost of preferred stock

$$\text{Preferred dividend} = 12\% \text{ of } \$10 \text{ par value} = \$1.20$$

$$\text{Market value of preferred stock} = \$12 \text{ per share}$$

$$\text{Cost of preferred stock} = \$1.20 / \$12 = 10.0\%$$

After-tax cost of debt

$$\text{After-tax cost of bonds} = \text{Pre-tax cost of bonds} \times (1 - \text{Tax rate})$$

$$6.86\% \times (1 - 30\%) = 4.8\%$$

Total market value of common stock

$$\text{Number of common shares} = \$4,000,000 / \$0.50 \text{ par} = 8,000,000 \text{ shares}$$

$$\text{Market value} = 8,000,000 \text{ shares} \times \$4.70 \text{ per share} = \$37,600,000$$

Total market value of preferred stock

$$\text{Number of preferred shares} = \$1,000,000 / \$10 \text{ par} = 100,000 \text{ shares}$$

$$\text{Market value} = 100,000 \text{ shares} \times \$12 \text{ per share} = \$1,200,000$$

Total market value of bonds

$$\text{Market value of bonds} = \text{Par value (from balance sheet)} \times \text{Current market value per bond} / 1,000$$

$$\$3,000,000 \times 1,045 / 1,000 = \$3,135,000$$

Weighted average cost of capital (WACC)

$$\text{WACC} = (\text{Cost of retained earnings} \times \text{Weight of retained earnings}) + (\text{Cost of preferred stock} \times \text{Weight of preferred stock}) + (\text{Post-tax cost of bonds} \times \text{Weight of bonds})$$

$$\text{Total capital} = \$37,600,000 + \$1,200,000 + \$3,135,000 = \$41,935,000$$

$$\text{Weight of retained earnings in capital structure} = \$37,600,000 / \$41,935,000 = 89.66\%$$

$$\text{Weight of preferred stock} = \$1,200,000 / \$41,935,000 = 2.86\%$$

$$\text{Weight of bonds} = \$3,135,000 / \$41,935,000 = 7.48\%$$

$$\text{WACC} = [(12.1\% \times 89.66\%) + (10.0\% \times 2.86\%) + (4.8\% \times 7.48\%)] = 11.5\%$$