

**A. MULTIPLE CHOICE QUESTIONS (46%)**

|    |   |
|----|---|
| 1  | A |
| 2  | B |
| 3  | D |
| 4  | B |
| 5  | A |
| 6  | C |
| 7  | A |
| 8  | A |
| 9  | B |
| 10 | A |
| 11 | D |
| 12 | D |

|    |   |
|----|---|
| 13 | A |
| 14 | D |
| 15 | D |
| 16 | B |
| 17 | A |
| 18 | D |
| 19 | D |
| 20 | A |
| 21 | D |
| 22 | A |
| 23 | C |
|    |   |

**B. PROBLEM SOLVING**

**Problem # 1 (8%)**

What is the incremental after-tax cash flow at disposal in Year 5?

To calculate the incremental after-tax cash flow at disposal in Year 5, start by calculating income after taxes.

Operating revenue of \$30,000 less \$10,000 of operating expenses equals \$20,000 operating income before depreciation.

Then to calculate depreciation, first determine total acquisition cost for the machine (including shipping and installation) as  $\$48,000 + \$2,000 = \$50,000$ .

Then multiply \$50,000 by 5.76% ( $11.52\% \times .5$  half-year convention because the machine is sold in Year 5, prior to the end of its depreciable life), which equals \$2,880.

Subtract depreciation of \$2,880 from \$20,000 to get \$17,120 of income before taxes. Calculate taxes by multiplying \$17,120 by 40% to get \$6,848. \$17,120 less \$6,848 equals income after taxes of \$10,272.

Next, we must consider what cash inflows and outflows need to adjust the income after tax number.

First, Depreciation is not a cash flow, so it must be added back.

Second, cash received from sales of equipment of \$8,000, a cash inflow, is added.

Third, return of net working capital of \$5,000, a cash inflow, is added.

Fourth, cash paid on taxes resulting from the gain on the sale of the machine of \$896 is subtracted.

To calculate this number determine book value at the time of sale, which is calculated by taking the original cost of the machine less the original cost multiplied by the percentage of cost that has already been depreciated.

Since the company is using MACRS as their depreciation method, 88.48% of the cost of the machine has already been depreciated. This is calculated as 20% Year 1 + 32% Year 2 + 19.20% Year 3 + 11.52% Year 4 + 5.76% Year 5 (11.52% x .5 half-year convention).

Therefore, \$50,000 x 88.48% = \$44,240.

The book value of the machine at time of sale is \$5,760 (\$50,000- \$44,240).

The machine is sold at the end of Year 5 for \$8,000, providing a gain on the sale of \$2,240 (\$8,000 sale price- \$5,760 book value). The tax paid on the \$2,240 gain from sale is \$896 (\$2,240 x 40%).

After considering these four additional items, after-tax cash flow for Year 5 is \$25,256 (\$10,272 + \$2,880 + \$8,000 + \$5,000- \$896).

The incremental after-tax cash flow for Year 5 is as follows:

|   |                        |
|---|------------------------|
| Operating Revenue                                 | \$30,000               |
| Operating Expenses                                | <u>(10,000)</u>        |
| Operating Income before Depreciation              | 20,000                 |
| Depreciation Expense                              | (2,880)                |
| Income Before Taxes                               | 17,120                 |
| Taxes (40%)                                       | <u>(6,848)</u>         |
| Income After Taxes                                | 10,272                 |
| Add back Depreciation                             | 2,880                  |
| Cash Received from Sale of Equipment              | 8,000                  |
| Return of Net Working Capital                     | 5,000                  |
| Cash out for Tax Expense on Profit from Machine   | (896)                  |
| <b>Incremental After-Tax Cash Flow for Year 5</b> | <b><u>\$25,256</u></b> |

**Problem # 2 (20%)**

**Required:**

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)

**Solution:**

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

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

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

$$d- \text{Average age of inventory (Days sales in Inventory)} = \frac{365}{\text{Inventory turnover}} = \frac{365}{21.82} = 16.7 \text{ days}$$

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

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

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

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

**Problem # 3 (8%)**

**Required:**

Calculate the target price that Nader needs to set for the new product to achieve a 15% after-tax return on investment (ROI)

Answer:

$$(\text{Total Sales} - \text{Total Variable Costs} - \text{Total Fixed Costs}) (1 - \text{Tax Rate}) = (\text{Target ROI}) (\text{Investment})$$

$$\text{Total Sales} = (\text{Volume}) (\text{Target Price}) = (25,000) (p)$$

$$\begin{aligned} \text{Total Variable Costs} &= (\text{Volume}) (\text{Variable Cost per Unit}) \\ &= (25,000) (\$200) = \$5,000,000 \end{aligned}$$

$$\text{Total Fixed Costs} = \$700,000$$

$$\begin{aligned} \text{Investment includes both plant and working capital} &= \$3,000,000 + \$1,000,000 \\ &= \$4,000,000. \end{aligned}$$

$$(25,000p - \$5,000,000 - \$700,000) (1 - 0.4) = (0.15) (\$4,000,000)$$

$$(25,000p - \$5,700,000) (0.6) = \$600,000$$

$$15,000p - \$3,420,000 = \$600,000$$

$$15,000p = \$4,020,000$$

$$\text{Target price} = \$268$$

**Problem # 4 (10%)**

**Required:**

1. Calculate the break-even point in quantity and value.

Sales = Q x P                      Q=Quantity      P: Price

$$1200\ 000 = 80\ 000 \times P$$

$$P = \frac{1200000}{80000} = \$15$$

$$V = \text{Variable Cost per unit} = \frac{40}{100} \times 15 = 6$$

$$\text{Total Variable Cost} = 80\ 000 \times 6 = \$480\ 000$$

$$\text{Total Cost} = \text{Sales} - \text{Profit}$$

$$= 1\ 200\ 000 - (2.25 \times 80\ 000)$$

$$= \$1\ 020\ 000$$

$$\text{Fixed Cost} = \text{Total Cost} - \text{Total Variable Cost}$$

$$= 1\ 020\ 000 - 480\ 000$$

$$= \$540\ 000$$

$$\text{Break Even Point: } Q_0 \quad f: \text{fixed cost} \quad \text{contribution Margin per unit} = P - v = 15 - 6 = 9$$

$$Q_0 = \frac{f}{P - V} = \frac{540000}{9} = 60\ 000 \text{ units}$$

$$\text{Break Even Point} = 60\ 000 \times 15 = \$900\ 000$$

2. Calculate the date of breakeven point assuming that sales are equally distributed over the months of the years.

$$\text{Date of Break Even Point (BEP)} = \frac{\text{BEP Volume}}{\text{Sales Volume}} \times 12 = \frac{60\ 000}{80\ 000} \times 12 = 9 \text{ months}$$

Or:

$$\text{Date of BEP} = \frac{540\ 000}{1\ 200\ 000 - 480\ 000} \times 12 = 9 \text{ months}$$

→ in 30/9 or 1/10

**Problem # 5 (8%)**

Suppose Nota Co. can issue stock for \$50 per share, before \$5 from flotation costs. The dividend at the end of the first year is expected to be \$3.50 per share, and future dividends are expected to grow at 5% per year. Calculate the estimated cost of new equity capital.

$$K_e = \frac{D_1}{P_0 - (F+U)} + g$$

$$= \frac{\$3.50}{\$50 - \$5} + 0.05 = 12.78\%$$

**Good Work!!**