

Problem 1(a): Cost of Goods Manufactured (COGM) Schedule

Step 1: Formula for COGM

$\text{COGM} = \text{Direct Materials Used} + \text{Direct Labor} + \text{Manufacturing Overhead} + \text{Beginning Work in Process Inventory} - \text{Ending Work in Process Inventory}$

Step 2: Calculate Direct Materials Used

$\text{Direct Materials Used} = \text{Raw Materials Beginning Inventory} + \text{Raw Materials Purchases} - \text{Raw Materials Ending Inventory}$

$$\text{Direct Materials Used} = 35,000 + 215,000 - 25,000 = 225,000$$

Step 3: Calculate Manufacturing Overhead

Manufacturing Overhead includes:

1. Indirect Labor: \$115,000
2. Depreciation (Factory Building): \$34,000
3. Factory Manager's Salary: \$40,000
4. Property Taxes (Factory): \$16,000

$$\text{Total Manufacturing Overhead} = 115,000 + 34,000 + 40,000 + 16,000 = 205,000$$

Step 4: Add Values to COGM Formula

$$\text{COGM} = 225,000 + 450,000 + 205,000 + 90,000 - 60,000$$

$$\text{COGM} = 910,000$$

Final Answer for Problem 1(a):

Cost of Goods Manufactured (COGM): Taka 910,000

Problem 1(b): Period Costs and Conversion Costs

Period Costs

Period Costs = Administrative Expenses + Delivery Expenses + Sales Commissions + Insurance (Head Office)

$$\text{Period Costs} = 250,000 + 100,000 + 150,000 + 24,000 = 524,000$$

Conversion Costs

Conversion Costs = Direct Labor + Manufacturing Overhead

$$\text{Conversion Costs} = 450,000 + 205,000 = 655,000$$

Final Answers for Problem 1(b):

1. Period Costs: Taka 524,000
2. Conversion Costs: Taka 655,000

Problem 2(a): Difference between Product Cost and Period Cost

- **Product Costs:** These are costs related to manufacturing a product (e.g., raw materials, direct labor, manufacturing overhead). They are part of the inventory cost until sold.
 - **Period Costs:** These are non-manufacturing costs, such as administrative and selling expenses, incurred during a specific period.
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Problem 2(b): Classification of Costs in Manufacturing

I'll explain the classification and examples of costs in manufacturing industries:

1. **Direct Costs:** Direct materials (e.g., steel for cars) and direct labor.
2. **Indirect Costs:** Indirect labor (e.g., supervisors) and factory overhead (e.g., electricity).
3. **Variable Costs:** Costs that vary with production levels (e.g., raw materials).
4. **Fixed Costs:** Costs that remain constant regardless of production levels (e.g., factory rent).
5. **Semi-Variable Costs:** Costs with both fixed and variable components (e.g., utility bills).

Problem 2(c): Five Differences Between Financial and Management Accounting

Financial Accounting	Management Accounting
Mandatory for legal reporting	Optional for internal decision-making
Focuses on external stakeholders	Focuses on internal stakeholders
Summarizes past performance	Oriented towards future planning and control
Governed by accounting standards (e.g., GAAP)	No specific standards; company-specific methods
Reports on overall business performance	Reports on specific segments or operations



Let's calculate **Problem 3** manually in written steps:

Step-by-Step Solution:

1. Compute the CM Ratio and Variable Expense Ratio

- Contribution Margin Ratio (CM Ratio):

$$\text{CM Ratio} = \frac{\text{Contribution Margin}}{\text{Sales}}$$
$$\text{CM Ratio} = \frac{300,000}{1,200,000} = 0.25 \text{ or } 25\%$$

- Variable Expense Ratio:

$$\text{Variable Expense Ratio} = 1 - \text{CM Ratio}$$
$$\text{Variable Expense Ratio} = 1 - 0.25 = 0.75 \text{ or } 75\%$$

2. Compute the Break-Even Point (Units and Dollar Sales)

- Contribution Margin Per Unit:

$$\text{CM Per Unit} = \frac{\text{Total Contribution Margin}}{\text{Total Units Sold}}$$
$$\text{CM Per Unit} = \frac{300,000}{20,000} = 15 \text{ per unit}$$

- Break-Even Units:

20,000

- Break-Even Units:

$$\text{Break-Even Units} = \frac{\text{Fixed Expenses}}{\text{CM Per Unit}}$$

$$\text{Break-Even Units} = \frac{240,000}{15} = 16,000 \text{ units}$$

- Break-Even Sales:

$$\text{Break-Even Sales} = \text{Break-Even Units} \times \text{Price Per Unit}$$

- Price Per Unit = $\frac{\text{Sales}}{\text{Units Sold}} = \frac{1,200,000}{20,000} = 60 \text{ per unit}$

$$\text{Break-Even Sales} = 16,000 \times 60 = 960,000$$

3. Contribution Margin at Break-Even Point


At the break-even point, the contribution margin equals the fixed expenses:

$$\text{Contribution Margin at Break-Even Point} = 240,000$$

4. Units Required for Target Profit (\$90,000)

To calculate the units needed to achieve a target profit:

$$\text{Units for Target Profit} = \frac{\text{Fixed Expenses} + \text{Target Profit}}{\text{CM Per Unit}}$$

$$\text{Units for Target Profit} = \frac{240,000 + 90,000}{15} = \frac{330,000}{15} = 22,000 \text{ units}$$


5. Margin of Safety (Dollars and Percentage)

- Margin of Safety in Dollars:

$$\text{Margin of Safety (Dollars)} = \text{Sales} - \text{Break-Even Sales}$$

$$\text{Margin of Safety (Dollars)} = 1,200,000 - 960,000 = 240,000$$

- Margin of Safety Percentage:

$$\text{Margin of Safety (\%)} = \frac{\text{Margin of Safety (Dollars)}}{\text{Sales}}$$

$$\text{Margin of Safety (\%)} = \frac{240,000}{1,200,000} = 0.2 \text{ or } 20\%$$

6. Effect of \$50,000 Increase in Sales

- Additional Contribution Margin:

$$\text{Additional CM} = \text{Increase in Sales} \times \text{CM Ratio}$$

$$\text{Additional CM} = 50,000 \times 0.25 = 12,500$$

- Additional Net Operating Income: Since fixed costs remain unchanged:

$$\text{Additional Net Operating Income} = \text{Additional CM} = 12,500$$

Final Answers:

1. **CM Ratio:** 25%
Variable Expense Ratio: 75%
2. **Break-Even Point:**
 - Units: 16,000
 - Dollar Sales: \$960,000
3. **Contribution Margin at Break-Even Point:** \$240,000
4. **Units for Target Profit (\$90,000):** 22,000
5. **Margin of Safety:**
 - Dollars: \$240,000
 - Percentage: 20%
6. **Additional Net Operating Income (from \$50,000 Sales Increase):** \$12,500

Would you like me to proceed to Problem 4?

Problem 4(a): Graph and Explanation for Variable Cost and Fixed Cost

Definitions:

1. Variable Cost:

- Changes with production volume.
- **Per Unit:** Remains constant.
- **In Total:** Increases proportionally with production.

2. Fixed Cost:

- Remains constant regardless of production volume.
 - **Per Unit:** Decreases as production increases (spreads over more units).
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Graph Explanation:

1. Variable Costs:

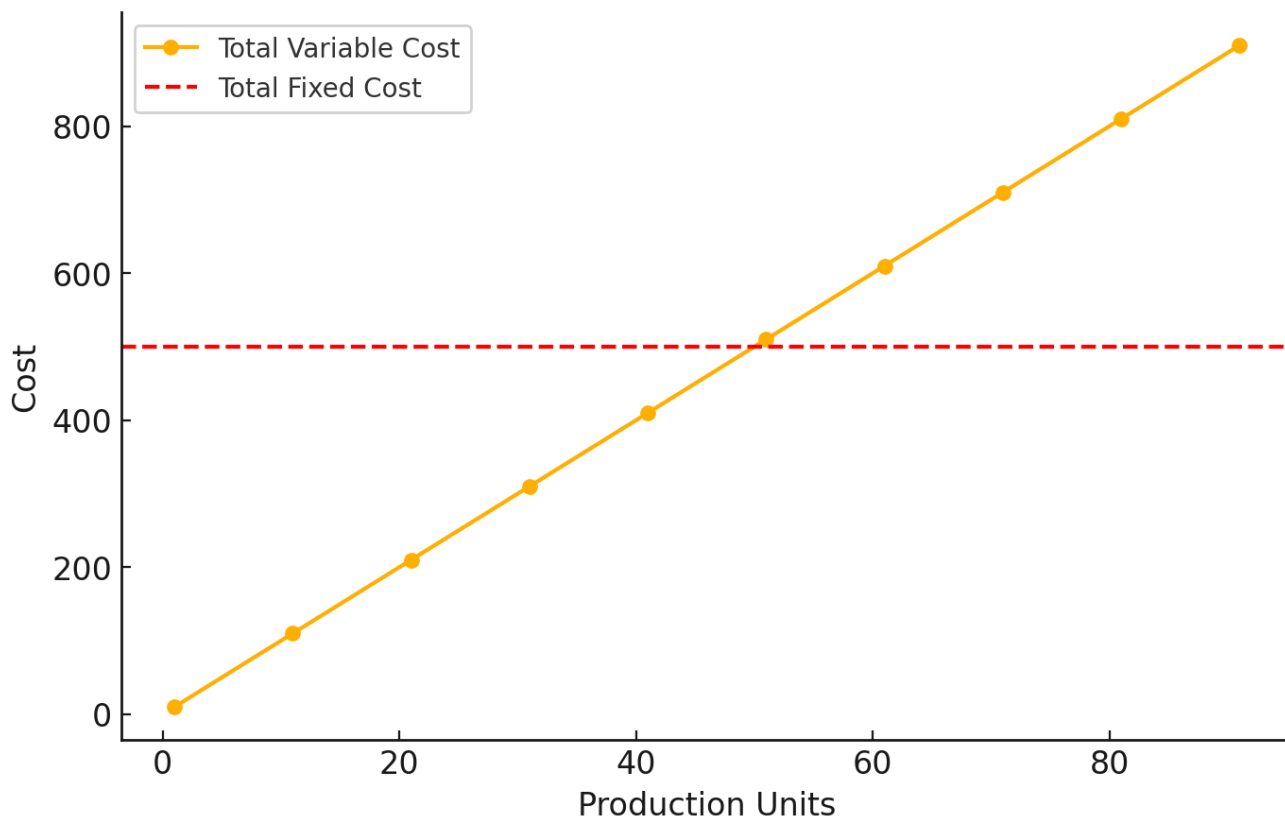
- **In Total:** Linear line with a positive slope starting from zero.
- **Per Unit:** Horizontal line because cost per unit remains constant.

2. Fixed Costs:

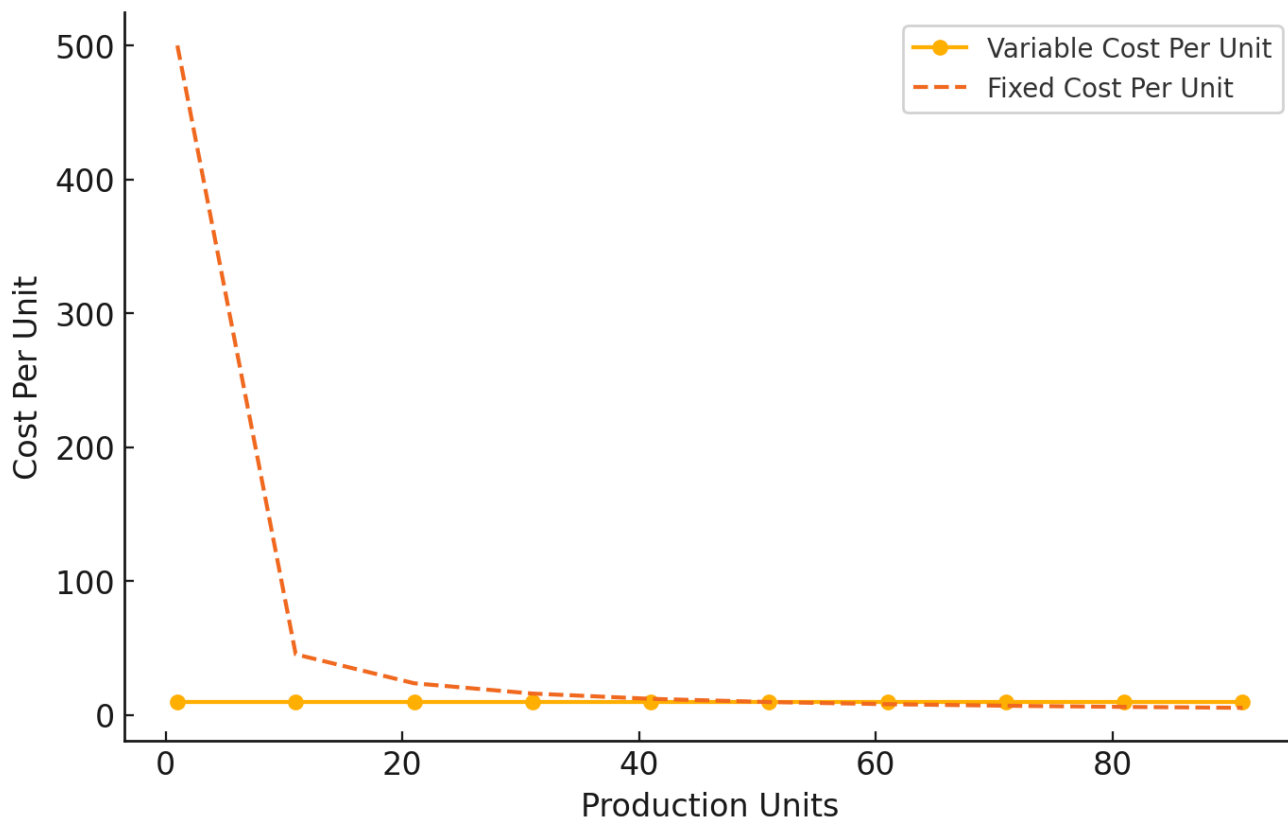
- **In Total:** Horizontal line (constant regardless of production volume).
- **Per Unit:** Downward-sloping curve as more units are produced.

I will draw the graphs to visualize these behaviors.

Total Costs: Variable and Fixed



Cost Per Unit: Variable and Fixed



Problem 4(b): Definitions and Examples

1. Cost Behavior:

- How costs change in response to changes in production or activity levels.
- Example: Utility bills (semi-variable cost).

2. Fixed Cost:

- Costs that remain constant regardless of production levels.
- Example: Rent for a factory.

3. Variable Cost:

- Costs that change directly with production levels.
- Example: Raw materials used in production.

4. Mixed Cost:

- Costs with both fixed and variable components.
- Example: Electricity bills (fixed charge + variable usage cost).

Problem 5: High-Low Method

Data:

- Occupancy Days (Activity Level) and Electrical Costs (Cost):

Month	Occupancy Days	Electrical Costs (\$)
High Point	2,406	5,184
Low Point	124	1,588

Steps:

1. Variable Cost Per Occupancy Day:

$$\text{Variable Cost Per Day} = \frac{\text{Cost Difference}}{\text{Activity Difference}}$$

$$\text{Variable Cost Per Day} = \frac{5,184 - 1,588}{2,406 - 124}$$

2. Fixed Cost (Using High Point):

$$\text{Fixed Cost} = \text{Total Cost at High Point} - (\text{Variable Cost Per Day} \times \text{High Point Occupancy Days})$$

3. Cost Formula:

$$\text{Total Cost} = (\text{Variable Cost Per Day} \times \text{Occupancy Days}) + \text{Fixed Cost}$$

4. Total Cost for 2,450 Occupancy Days: Substitute 2,450 into the cost formula.

Written Calculations

Step 1: Variable Cost Per Occupancy Day

$$\text{Variable Cost Per Day} = \frac{5,184 - 1,588}{2,406 - 124} = \frac{3,596}{2,282} \approx 1.576 \text{ per day}$$

Step 2: Fixed Cost

$$\text{Fixed Cost} = 5,184 - (1.576 \times 2,406)$$

$$\text{\text{Fixed Cost}} = 5,184 - 3,791.46 = 1,392.54 \text{\text{ (rounded to nearest dollar: \$1,393)}}$$

Step 3: Cost Formula

$$\text{Total Cost} = (1.576 \times \text{Occupancy Days}) + 1,393$$

Step 4: Total Cost for 2,450 Occupancy Days

$$\text{Total Cost} = (1.576 \times 2,450) + 1,393$$

$$\text{\text{Total Cost}} = 3,862.20 + 1,393 = 5,255.20 \text{\text{ (rounded to \$5,255)}}$$

Final Answers:

1. Variable Cost Per Occupancy Day: \$1.576
2. Fixed Cost Per Month: \$1,393
3. Cost Formula:

$$\text{Total Cost} = (1.576 \times \text{Occupancy Days}) + 1,393$$

4. Total Cost for 2,450 Occupancy Days: \$5,255

Problem 6: Financial Ratios for Walton Corporation

Given Data:

Balance Sheets:

Account	2024 (\$)	2023 (\$)
Cash	15,300	13,700
Accounts Receivable	21,200	23,400
Inventory	19,000	7,000
Land	20,000	26,000
Building	70,000	70,000
Accum. Depreciation	(15,000)	(10,000)
Total Assets	130,500	130,100
Accounts Payable	20,370	31,100
Common Stock	85,000	69,000
Retained Earnings	25,130	30,000
Total Liabilities and Equity	130,500	130,100

Income Statement:

- Net Sales: \$220,000
- Cost of Goods Sold (COGS): \$50,000
- Net Income: \$24,000

Ratios to Calculate:

1. Current Ratio:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets (2024):

$$\text{Cash} + \text{Accounts Receivable} + \text{Inventory} = 15,300 + 21,200 + 19,000 = 55,500$$

Current Liabilities (2024):

$$\text{Accounts Payable} = 20,370$$

$$\text{Current Ratio (2024)} = \frac{55,500}{20,370} \approx 2.72$$

Repeat the same calculation for 2023.

2. Accounts Receivable Turnover:

$$\text{AR Turnover} = \frac{\text{Net Sales}}{\text{Average Accounts Receivable}}$$

Average AR:

$$\text{Average AR} = \frac{\text{Beginning AR} + \text{Ending AR}}{2} = \frac{23,400 + 21,200}{2} = 22,300$$

$$\text{AR Turnover} = \frac{220,000}{22,300} \approx 9.87 \text{ times}$$

3. Inventory Turnover:

$$\text{Inventory Turnover} = \frac{\text{COGS}}{\text{Average Inventory}}$$

Average Inventory:

$$\text{Average Inventory} = \frac{\text{Beginning Inventory} + \text{Ending Inventory}}{2} = \frac{7,000 + 19,000}{2} = 13,000$$

$$\text{Inventory Turnover} = \frac{50,000}{13,000} \approx 3.85 \text{ times}$$

4. Profit Margin:

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Net Sales}}$$

$$\text{Profit Margin} = \frac{24,000}{220,000} \approx 0.109 \text{ or } 10.9\%$$

5. Return on Assets (ROA):

$$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

Average Total Assets:

$$\text{Average Total Assets} = \frac{\text{Beginning Assets} + \text{Ending Assets}}{2} = \frac{130,100 + 130,500}{2} = 130,300$$

$$\text{ROA} = \frac{24,000}{130,300} \approx 0.184 \text{ or } 18.4\%$$

6. Return on Equity (ROE):

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average Equity}}$$

Total Equity (2023 and 2024):

$$2023 \text{ Equity} = \text{Common Stock} + \text{Retained Earnings} = 69,000 + 30,000 = 99,000$$

$$2024 \text{ Equity} = \text{Common Stock} + \text{Retained Earnings} = 85,000 + 25,130 = 110,130$$

Average Equity:

$$\text{Average Equity} = \frac{99,000 + 110,130}{2} = 104,565$$

$$\text{ROE} = \frac{24,000}{104,565} \approx 0.229 \text{ or } 22.9\%$$

Final Answers:

1. Current Ratio (2024): 2.72
2. Accounts Receivable Turnover: 9.87 times
3. Inventory Turnover: 3.85 times
4. Profit Margin: 10.9%
5. Return on Assets (ROA): 18.4%
6. Return on Equity (ROE): 22.9%

