Accounting for Financial and Managerial Decision and Control [AFMDC]

Unit 10

Pricing Decision: External Transfer

Lecturer: Dr. Jeetendra Dangol

Contents

- Concepts and objectives of pricing decision
- Pricing technique
  - Full cost and variable cost pricing
  - Return on Investment (ROI) pricing
  - Activity Based Costing (ABC) pricing
  - Target pricing

Learning Objectives

- Understand the concept of pricing decision
- Describe the factors which influence the pricing decision
- Explain the objective of pricing
- Determine the price using full cost pricing, variable cost pricing, Return on Investment (ROI) pricing, Activity Based Costing (ABC) pricing and Target pricing

Concept of Pricing Decision

- Enterprises are required to set up selling price of the products or services
- The assignment of a selling price to a product or service provided by the firm is pricing
- It can be defined as the act of determining the price is known as pricing decision
- The price of a product is simply the terms on which it can be acquired.
- Examples: tuition fee for education, rent for room, fee for doctor, fare for transportation, salary to executive, wages to workers

Concept of Pricing Decision

- Pricing is a crucial decision-making problem faced by concerned decision-maker
- How are prices set?
  - Price becomes dominated by the customer’s choice and customer behaviors
  - In practice, prices were set up by negotiation between the buyer and seller.
  - Through bargaining, they would arrive at an acceptable price
  - Price still remains one of the most important elements determining enterprise market share and profitability

Factor Influencing Pricing Decision

- Cost of product and desired profit
- Enterprise’s objective
- Product nature
- Production capacity utilization – full or below capacity utilization
- Market demand
- Market competition – Perfect or monopolistic
- Customer’s purchasing capacity
- Government guidelines
- Economical and political conditions

Objectives of Pricing Decision

- To satisfy the various constraints of government regulation
- To determine the price of a product or service based on relevant cost data and other information
- To increase the growth rate of sale
- To discourage and safeguard against the emergence of new producers in the same line
- To maximize the share of the market
- To charge reasonable price to keep good relation with community

Methods of Pricing

A. For sales external to the firm, i.e., to its customers:
   1. Full Cost Pricing
   2. Variable Cost Pricing
   3. Return on Investment Pricing (ROI)
   4. Target Pricing
   5. Activity-based-costing Pricing (ABC)

B. For internal transfer between departments of same organization:
   1. Market-based Transfer Pricing
   2. Full Cost Transfer Pricing
   3. Variable Cost Transfer Pricing
   4. Negotiated Pricing
   5. General-transfer-pricing Rule

Full Cost Pricing

- Selling price is determined on the basis of total costs
- Absorption cost or total cost pricing
- All cost plus profit margin

- Methods:
  - Equation
  - Vertical/Table

- Equation method
  Price = Total Cost + (Total Cost × Mark-up Percentage)

Full Cost Pricing

- Methods: Vertical/Table

Manufacturing Cost:	
Direct Materials per Unit	× × ×
Direct Labour per Unit	× × ×
Variable Manufacturing Overhead per Unit	× × ×
Fixed Manufacturing Overhead per Unit	× × ×
Total Manufacturing Cost per Unit	× × ×
Non-manufacturing Cost:	
Variable Administrative and Selling Cost per Unit	× × ×
Fixed Administrative and Selling Cost per Unit	× × ×
Total Non-manufacturing Cost per Unit	× × ×
Total Cost per Unit (Manufacturing + Non-manufacturing Cost per Unit)	× × ×
Add: Normal Mark-up per Unit (Total Cost per Unit × Mark-up Percentage)	× × ×
Selling price per unit	× × ×

Instead of cost per unit, the statement also can be prepared by considering total output units and total amount. In that case, after finding out total sales value, it must be divided by production unit for the determination of selling price per unit.

Advantages of Full Cost Pricing

- Recovery of total cost is ensured by full cost pricing method and it also provides a reasonable rate of return to the firm.
- It helps to determine the price easily in contracting industries where a price of the contract is determined by considering fixed cost.
- Stability of selling price is more possible in full cost pricing method than others, which is more justifiable to customers.
- Full cost pricing is simple and easy to understand as it is consistent with absorption costing system.
- Estimation of demand of products not required for determining the price is full cost pricing. Instead of its a standard profit margin can be used.

Disadvantages of Full Cost Pricing

- All fixed costs are included in the total cost. There are different methods of apportionment and re-apportionment of fixed overhead. The total cost will depend on which apportionment method is used and the cost of different products may differ.
- Demand and competition are ignored by this method by which the chances of under pricing or overpricing of the products may occur in the firm.
- Selling price may be fluctuated due to the selection of volume or capacity base which is very important in full cost pricing.
- The total sales revenue may be inadequate to cover the total fixed cost, when the sales demand will be less than the volume or capacity level which has been used to estimate total unit cost.
- Relevant (Variable Cost) and Irrelevant (Fixed Cost) Costs are not distinguished under this method.

Question 1 (Full Cost Pricing)

The following information are provided to you

	Per Unit (Rs.)
Direct Material	8
Direct Labour	2
Manufacturing Overhead	
Variable	5
Fixed	5
Non-manufacturing Overhead	
Variable Selling and Administration	1
Fixed Selling and Administration	3
Normal Capacity and Production	10,000 units

Required: Price quotation sheet for the company on absorption (full cost pricing) basis if company has policy of adding profit per unit is to be 25% of the total cost.

Solution 1 (Full Cost Pricing)

Price = Total Cost + (Total Cost × Mark-up Percentage)
Price = Rs. 24 + (Rs. 24 X 25%)
Price = Rs. 24 + Rs. 6
Price = Rs. 30 per unit
[OR]

Price Quotation Sheet (Absorption Costing Basis)

	Per unit (Rs.)
Manufacturing Cost:	
Direct Materials per Unit	8
Direct Labour per Unit	2
Variable Manufacturing Overhead per Unit	5
Fixed Manufacturing Overhead per Unit	5
Total Manufacturing Cost per Unit	20
Non-manufacturing Cost:	
Variable Administrative and Selling Cost per Unit	1
Fixed Administrative and Selling Cost per Unit	3
Total Non-manufacturing Cost per Unit	4
Total Cost per Unit (Manufacturing + Non-manufacturing Cost per Unit)	24
Add: Normal Mark-up per Unit (Rs. 24 ∞ 25%)	6
Selling Price per Unit	30

Variable Cost Pricing

- Selling price is determined on the basis of total variable costs
- Use only variable cost as the basis for pricing
- Marginal costing or contribution method of pricing
- All Variable cost plus profit margin
- Management is assured that the mark-up on variable cost is adequate to cover all allocable fixed cost and provide normal return

- Methods:
  - Equation
  - Vertical/Table

- Equation method

  Price = Total Variable Cost + (Total Variable Cost × Mark-up Percentage)

Variable Cost Pricing

- Methods: Vertical/Table

Variable Costs:	Rs.
Direct Materials per Unit	× × ×
Direct Labour per Unit	× × ×
Variable Manufacturing Overhead per Unit	× × ×
Variable Administrative and Selling Cost per Unit	× × ×
Total Variable Cost per Unit	× × ×
Add: Normal Mark-up per Unit (Total Variable Cost per Unit × Mark-up Percentage)	× × ×
Selling Price per Unit	× × ×

Or, If Cost is Defined as per Total Amount

Variable Costs	Rs.
Direct Materials	× × ×
Direct Labour	× × ×
Variable Manufacturing Overhead	× × ×
Variable Administrative and Selling Cost	× × ×
Total Variable Cost	× × ×
Add: Normal Mark-up (Total Variable Cost × Mark-up Percentage)	× × ×
Total Sales Value	× × ×

Question 2 (Variable Cost Pricing)

The following information are provided to you

	Per Unit (Rs.)
Direct Material	8
Direct Labour	2
Manufacturing Overhead	
Variable	5
Fixed	5
Non-manufacturing Overhead	
Variable Selling and Administration	1
Fixed Selling and Administration	3
Normal Capacity and Production	10,000 units

Required: If company assumed mark-up of 100% of variable cost is adequate to cover allocable fixed cost and to provide the desired profit per unit. Find out the selling price per unit.

Solution 2 (Variable Cost Pricing)

Price = Total Variable Cost + (Total Variable Cost × Mark-up Percentage)
Price = Rs. 16 + (Rs. 16 X 100%)
Price = Rs. 16 + Rs. 16
Price = Rs. 32 per unit

[OR]

Price Quotation Sheet (Variable Cost Pricing Basis)

Manufacturing Cost	Per Unit (Rs.)
Direct Materials per Unit	8
Direct Labour per Unit	2
Variable Manufacturing Overhead per Unit	5
Variable Selling and Administrative Cost per Unit	1
Total Variable Cost per Unit	16
Add: Mark-up per Unit (Rs. 16 × 100%)	16
Selling Price per Unit	32

Return on Investment (ROI) Pricing

- Full cost pricing and variable cost pricing ignore the capital investment
- ROI pricing considers capital investment required to produce target return
- ROI based pricing is also referred as cost of capital-based pricing.
- It relates price not only to the short-term cost of production but also to the capital investment required for the production and distribution of the product

Return on Investment (ROI) Pricing

- How is the normal mark-up determined?

Step 1:	To find out total capital employed
Step 2:	To find out total cost of the product
Step 3:	To find out mark-up percentage by using following equation : $\text{Percentage Mark-up} = \frac{\text{Capital Employed}}{\text{Total Annual Cost}} \times \text{Planned Rate of Return on Capital Employed}$
Step 4:	To determine the Selling Price on the basis of mark-up percentage (Step 3)

Return on Investment (ROI) Pricing

If Cost is defined as per unit	
Manufacturing Cost :	
Direct Materials per Unit	× × ×
Direct Labour per Unit	× × ×
Variable Manufacturing Overhead per Unit	× × ×
Fixed Manufacturing Overhead per Unit	× × ×
Total Manufacturing Cost per Unit	× × ×
Non-manufacturing Cost :	
Variable Administrative and Selling Cost per Unit	× × ×
Fixed Administrative and Selling Cost per Unit	× × ×
Total Non-manufacturing Cost per Unit	× × ×
Total Cost per Unit (Manufacturing + Non-manufacturing Cost per Unit)	× × ×
Add: Normal Mark-up per Unit (Total Cost per Unit × Mark-up Percentage)	× × ×
Selling Price per Unit	× × ×

Return on Investment (ROI) Pricing

Or, If Cost is Defined as per Total Amount

Manufacturing Cost :	
Direct Materials	× × ×
Direct Labour	× × ×
Variable Manufacturing Overhead	× × ×
Fixed Manufacturing Overhead	× × ×
Total Manufacturing Cost	× × ×
Non-manufacturing Cost :	
Variable Administrative and Selling Cost	× × ×
Fixed Administrative and Selling Cost	× × ×
Total Non-manufacturing Cost	× × ×
Total Cost (Manufacturing + Non-manufacturing Cost)	× × ×
Add: Normal Mark-up (Total Cost × Mark-up Percentage)	× × ×
Total Sales Value	× × ×

Question 3 (ROI Pricing)

An organization producing a product wished to obtain Return on Capital Employed (ROCE) of 20%. The organization bases selling prices on normal production levels and it wished to know the selling price that will produce this required rate of return. The following estimates have been made.

Variable Cost	Rs. 10 per unit
Fixed Cost	Rs. 5,00,000
Normal Production	10,000 Units

Normal Capital Employed	
Total	Rs. 750,000
Variable (Working Capital)	Rs. 5 per unit
Fixed Capital	Rs. 700,000

Required:

Calculate the Selling Price needed to achieve the Planned Returned on Capital Employed to match the Organization's Objectives.

Solution 3 (ROI Pricing)

Step 1: To find out Total Capital Employed.

Capital Employed = (10,000 units × Rs. 5) + 7,00,000

= Rs. 7,50,000

Step 2: To find out Total Cost of the product.

Total Annual Cost = (10,000 units × Rs. 10) + 5,00,000

= Rs. 6,00,000

Step 3: $$\text{Percentage Mark-up} = \frac{\text{Capital Employed}}{\text{Total Annual Cost}} \times \text{Planned Rate of Return on Capital Employed}$$

= Rs. 700,000/600,000 × 20%

= 25%

Solution 3 (ROI Pricing)

Step 4: To determine the selling price on the basis of mark-up percentage.

The selling price per unit that will produce the required ROI is:

Details	Per unit cost	Total cost for 10,000 units
Variable cost	Rs. 10	Rs. 1,00,000
Fixed cost	Rs. 50*	Rs. 500,000
Total cost	Rs. 60	Rs. 600,000
Add: Mark-up @25%	Rs. 15**	Rs. 150,000***
Total Sales Value		Rs. 750,000
Selling Price per unit	Rs. 75	Rs. 750,000/10,000 = Rs. 75

*Fixed cost per unit = Rs. 500,000 / 10,000 units = Rs. 50 per unit
**Profit per unit = Rs. 60 × 25% = Rs. 15
*** Total Profit = Rs 600,000 × 25% = Rs. 150,000

Target Pricing

- Target pricing is based on target costing
- It starts with a review of the market place and includes the involvement of senior management in its processes
- It is originated in Japan and now-a-days it is being used by worldwide companies
- Company first uses market research to determine the price of which the new product will sale
- The estimate is based on the understanding of customers perceived value for the product
  - Companies which are going to use target costing, have to determine the price at which they can sell their product
- Then they have to estimate the total cost for the product
- If the total cost of the product is sufficiently low, the product may be launched Conversely, if the total cost is too high, the product may be unjustified

Target Pricing

Step 1: Estimate price which target customer can pay or want to pay or wiliness to pay
Step 2: Estimate total cost
Step 3: Decision

If, Price (Step 1) > Estimated total cost (Step 2), then produce and launch the product in the market

If, Price (Step 1) < Estimated total cost (Step 2), then drop the idea

Sometime, management may think about the target profit as well.

Question 4 (Target Pricing)

The market research department has indicated that the new product would likely rate to Rs. 28. Such product cost as follows.

	Per Unit (Rs.)
Direct Material	8
Direct Labour	2
Manufacturing Overhead	
Variable	5
Fixed	5
Non-manufacturing Overhead	
Variable Selling and Administration	1
Fixed Selling and Administration	3

Required: (a) Should the company manufacture the product, if it is using target pricing?

(b) What price would the company charge for the product if the company wants 25% profit on cost?

Solution 4 (Target Pricing)

(a) **Computation of target cost**

	Per unit (Rs.)
Manufacturing Cost:	
Direct Materials per Unit	8
Direct Labour per Unit	2
Variable Manufacturing Overhead per Unit	5
Fixed Manufacturing Overhead per Unit	5
Total Manufacturing Cost per Unit	20
Non-manufacturing Cost:	
Variable Administrative and Selling Cost per Unit	1
Fixed Administrative and Selling Cost per Unit	3
Total Non-manufacturing Cost per Unit	4
Total Cost per Unit (Manufacturing + Non-manufacturing Cost per Unit)	24
Target Selling Price per Unit	28

Decision: Total cost per unit of the product is sufficiently low than its selling price. Thus, the product can be launched.

Alternative method:

Step 1: Estimate price = Rs.28 per unit

Step 2: Estimate cost = Rs. 24 per unit

Step 3: Decision

Estimated Price (Rs 28) is higher than estimated total cost (Rs.24), the product can be produced and launched in the market.

Solution 4 (Target Pricing)

(b) Computation of Selling Price

		Per unit (Rs.)
	Total Cost per Unit	24
Add:	Normal Mark-up per Unit (Rs. 24 × 25%)	6
	Selling Price per Unit	30

Activity Based Costing (ABC) Pricing

- Activity Based Costing
- Traditional product costing systems were designed decades ago when most companies manufactured a narrow range of products, and direct labour and materials were the dominant factory cost
- Overhead costs were relatively small, and the distortions arising from inappropriate overhead allocations were not significant
- Today companies produce a wide range of products; direct labour represents only a small fraction of total costs, and overhead costs are of considerable importance

Activity-Based Costing

- Cooper and Kaplan (1988) have developed a more refine approach for assigning overheads to products and computing product costs
- They call this approach “activity-based costing (ABC)”
- It is claimed that ABC provides product cost information that is useful for decision-making purposes
- Activity based costing, relation between overhead costs and different activities

Advantages/Need of Activity Based Costing System

- To find out realistic product cost
- Useful for the purpose of correct allocation of all the overhead costs
- overhead is allocated on the basis of activities
- helpful in the control and reduction of cost
- flexible enough to trace cost for different activities.
- classifies cost into long-run and short-run variable costs
  - This classification is relevant to strategic decision making.
- Activity-based costing provides useful financial and non-financial measures
  - The cost driver rate is the example of financial measure and transaction volume the example of non-financial measure

Objectives of Activity Based Costing System

- to assign overhead cost on activity basis
- to identify available resources and resource-consuming activities
- to determine more accurate total cost of production or service
- to rectify the inaccurate cost information and to supply accurate cost of management
- to assist management for planning and forecasting
- to help management in taking decision for the better result

Limitations of Activity Based Costing System

- more complex than the traditional costing system
  - numerous cost pools and multiple cost drivers
  - more expensive - may not be affordable for small organizations.
- more useful to the organizations overhead costs are related to activities rather than unity.
  - If most of the overheads are related to units, the traditional system of costing will be more useful.
- complicated for the firms that rely on market-based pricing
- positive attitude and employee support are most necessary
- primary stage of development
  - its applicability is still doubted.

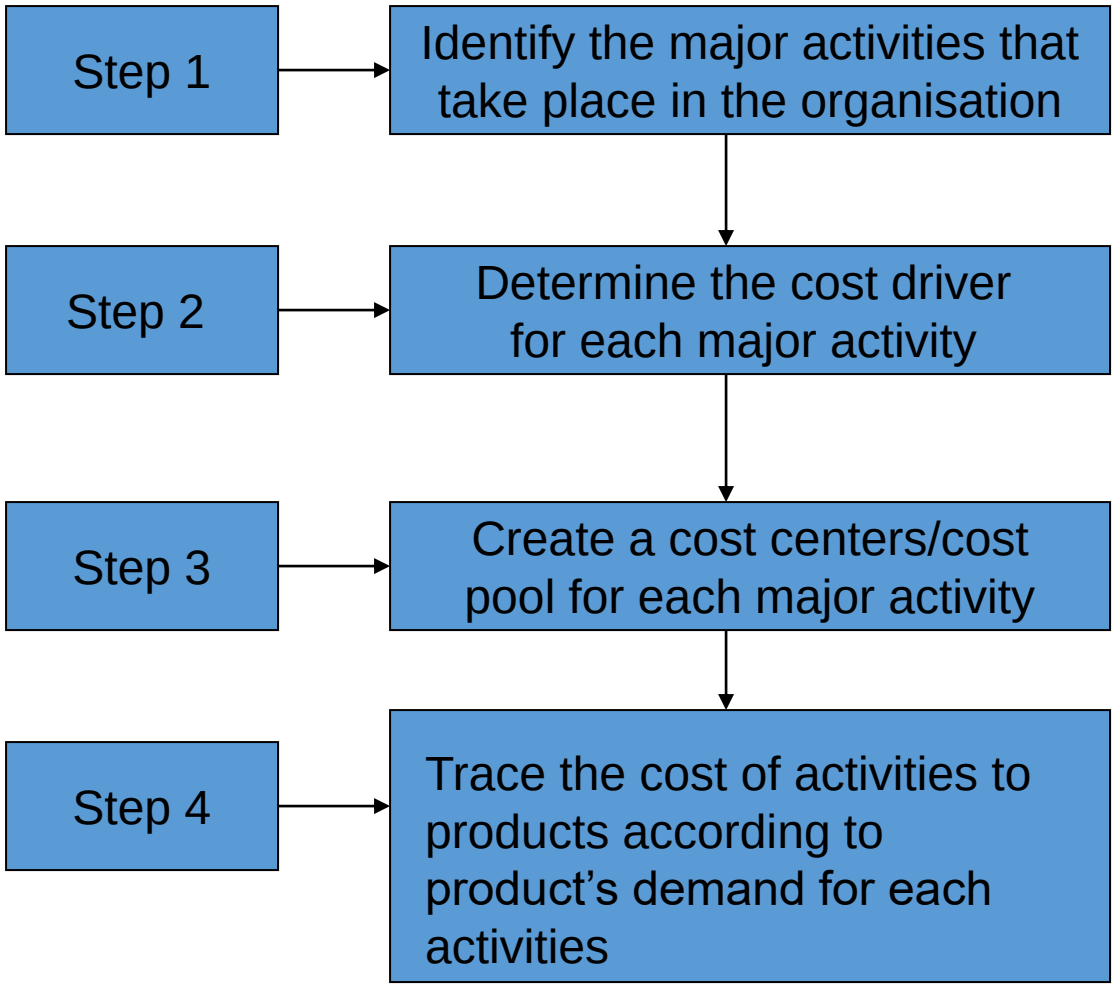
Limitations of Traditional Costing System

- Charging overhead on basis of units
- Emphasizing production unit, not activity
- High proportion of direct cost in total cost
- Use single cost driver

Conclusion

- ABC has attracted a considerable amount of interest because it provides not only a basis for calculating more accurate product costs but also a mechanism for managing overhead cost
- By collecting and reporting on the significant activities in which a business engages, is possible to understand and manage costs more effectively
- ABC system may have their greatest potential in the area of cost management

ABC System Involves Following Stages



Machine related, Set-up related, Purchasing related

Activity	Cost driver
Volume related	Machine hrs
Set-up related	No. of set-up
Purchase related	N0. of purchase orders

Cost centers/cost pool
Machine related cost
Set-up cost
Purchase cost

Set-up cost Rs. 100,000
Number of set-up 100
Rate per set-up Rs. 1,000

Method for computing cost under ABC

Step 1:	To find out the overhead cost traced to activities
Step 2:	To determine the cost driver for each activity
Step 3:	To find out the cost driver rate $\text{Cost Driver Rate} = \frac{\text{Cost Traced to Activities}}{\text{Number of Cost Drivers}}$
Step 4:	To find out Overhead Cost traced to product: Overhead Cost Traced to Product = Cost Driver Rate × Number of Cost Drivers

Question 5 (ABC Pricing)

Assume that a firm makes two products A and B. Data for the period are as follows:

	Product A	Product B
Output in Units	1000	10,000
Machine Hour per Unit	2	2
Direct Labour Hour per Unit	4	4
Material Cost per Unit	Rs. 20	Rs. 25
Direct Labour Cost per Hour	Rs. 10	Rs. 10
Number of Purchase Orders	80	160
Number of Set-ups	40	60

Overhead Costs:

Short-term Variable Cost	Rs. 1,10,000
Material Purchasing and Ordering	Rs. 1,20,000
Set-up Costs	Rs. 2,10,000
Total Overhead Costs	Rs. 4,40,000

The cost drivers to be used are as listed below for the overhead cost shown:

Cost	Cost Drivers
Short Term Variable Costs	Machine Hours
Material Purchasing and Ordering	No. of Orders
Set-ups	No. of Set-ups

Required:

Pricing by adding mark-up of 20% on cost under :

i. Traditional costing system (Conventional method) using Machine hours.

ii. Activity-based costing system

Solution 5 (ABC Pricing)

Step 1: Total OH = 110,000 + 120,000 + 210,000 = 440,000

Step 2: Total Machine Hours = Production units X Machine hours per unit

Machine Hours (Product A) = 1,000 units X 2 Hours = 2,000 Hours

Machine Hours (Product B) = 10,000 units X 2 Hours = 20,000 Hours

Total Machine Hours = 2,000 + 20,000 = 22,000 Hours

Step 3: Overhead cost per Machine Hour = Total OH (Step 1)/Total Machine Hours (Step 2)

Overhead Cost per Machine Hour = 440,000/22,000 hrs. = Rs 20 per hr.

Step 4: Overhead cost per unit = Machine hours required per unit X OH cost per hour

OH cost per unit (Product A) = 2 Hours X Rs 20 per hour = Rs. 40 per unit

OH cost per unit (Product B) = 2 Hours X Rs 20 per hour = Rs. 40 per unit

Step 5: Total Overhead = Production units X Overhead cost per unit

Total Overhead (Product A) = 1,000 units X Rs. 40 = Rs. 40,000

Total Overhead (Product B) = 10,000 units X Rs. 40 = Rs. 400,000

Solution 5 (ABC Pricing)

Step 6: **Pricing Under Traditional Costing System**

Cost Items	Product A		Product B	
	Per Unit	Rs.	Per Unit	Rs.
Direct Material	20	20,000	25	2,50,000
Direct Labour	40	40,000	40	4,00,000
Prime Cost	60	60,000	65	6,50,000
Overhead	40	40,000	40	4,00,000
Total Costs	100	1,00,000	105	10,50,000
Add: Profit (20% on cost)	20	20,000	21	2,10,000
Target Selling Pricing	120	1,20,000	126	12,60,000

Solution 5 (ABC Pricing)

ii. Activity Based Costing Pricing

Step 1: Determination of Cost Driver Rate

Cost Center/Activities	Overhead Cost (Rs.)	Cost Driver	No. of Cost Driver			Cost Driver Rate
			Product A	Product B	Total	
1	2	3	4	5	6 = 4+5	7 = 2 ÷ 6
Short-term Variable Cost	1,10,000	Machine Hours	2,000	20,000	22,000	Rs. 5
Material Purchasing and Ordering	1,20,000	No. of Orders	80	160	240	Rs. 500
Set-ups	2,10,000	No. of Set-ups	40	60	100	Rs. 2,100

Step 2: Determination of Overhead Allocation to Products:

Cost Center/Activities	Cost Driver Rate	Product A		Product B	
		No. of Cost Driver	Amount	No. of Cost Driver	Amount
1	2	3 = Above 4	4 = 2 × 3	5 = Above 5	6 = 2 × 5
Short-term Variable Cost	5	2,000	10,000	20,000	1,00,000
Material Purchasing and Ordering	500	80	40,000	160	80,000
Set-ups	2,100	40	84,000	60	1,26,000
Total			**1,34,000**		**3,06,000**

Solution 5 (ABC Pricing)

Step 3: Determination of Overhead Rate per unit Allocation to Products

$$\text{Overhead Rate per Unit} = \frac{\text{Total Overhead}}{\text{Outputs}}$$

$$\text{Overhead Rate per unit for Product A} = \frac{\text{Rs. 1,34,000}}{\text{1,000 units}} = \text{Rs. 134 per unit}$$

$$\text{Overhead Rate per unit for Product B} = \frac{\text{Rs. 3,06,000}}{\text{10,000 units}} = \text{Rs. 30.60 per unit}$$

Step 4: Determination of Sales Price

If cost per unit:

	Product A (Rs.)	Product B (Rs.)
Direct Material per unit	20	25
Direct Labour per unit	40	40
Prime Cost per unit	60	65
Overhead Allocation per unit	134	30.60
Total Cost per unit	194	95.60
Add: Normal Mark-up per unit (20% on cost)	38.80	19.12
Sales Price per unit	232.80	114.72

Solution 5 (ABC Pricing)

Step 4: Determination of Sales Price

Alternatively, if Total Cost (Ctrl)

	Product A (Rs.)	Product B (Rs.)
Production Units	1,000 units	10,000 units
Direct Material	20,000	2,50,000
Direct Labour	40,000	4,00,000
Prime Cost	60,000	6,50,000
Overhead Allocation	1,34,000	3,06,000
Total Cost	1,94,000	9,56,000
Add: Normal Mark-up (20% on cost)	38,800	1,91,200
Total Sales Revenue	2,32,800	11,47,200
Sales per Unit = $\frac{\text{Sales Revenue}}{\text{Output in Units}}$	$\frac{\text{Rs. 2,32,800}}{\text{1,000 units}}$	$\frac{\text{Rs. 11,47,200}}{\text{10,000 units}}$
	Rs. 232.80	Rs. 114.72

References

- Anthony, R.N., Hawkins, D.F. & Merchant, K.A. (2012). *Accounting: Text and cases*. The McGraw-Hill Companies
- Atkinson, A. A., Kaplan, R. S., Matsumura, E. M., Young, S. M., & Kumar, G. A. (2014). *Management accounting: Information for decision-making and strategy execution*. Pearson Education
- Dangol, R. M. & Dangol, J. (2019). *Accountancy for financial and managerial decision and control*. Taleju Prakashan

Thank You