Accounting for Financial and Managerial Decision and Control [AFMDC]

Unit 11

Pricing Decision: Transfer Pricing in Decentralized Conditions

Lecturer: Dr. Jeetendra Dangol

Contents

- Concepts of transfer pricing between departments of same organization (internal transfer) under decentralized condition

- **Pricing technique**
- Market-based transfer pricing
- Full cost transfer pricing
- Variable cost transfer pricing
- Negotiated pricing
- General-transfer-pricing rule

Learning Objectives

- Understand the concepts of internal transfer pricing between departments of same organization under decentralized condition
- Determine the transfer price using Market-based transfer pricing, Full cost transfer pricing, Variable cost transfer pricing, Negotiated pricing and General-transfer-pricing rule

Concept of Internal Transfer Pricing between Departments of Same Organization under Decentralized Condition

- It is concerned with transfer price between departments of same organization.
- Transfer price - notional value
- Decentralization
  - delegation of decision-making to the sub-units of an organization.
  - lower the level where decisions are made, the greater is the decentralization.
  - the most effective in organization where cost and profit measurement is necessary and is most successful in organizations where sub units are totally independent and autonomous.

Concept of Internal Transfer Pricing between Departments of Same Organization under Decentralized Condition

- The problem of pricing arises when such a transfer of materials, work-in-progress, finished goods or service is made from one department to another department of same company.
- It transfers prices are set too high, the supplier department will be favored, whereas if set is too low, the buyer will receive an unwarranted proportion of the profit.
- The actual performance of each seller and buyer department may not be reflected.
- The transfer pricing affects not only the profits of the supplier and receiving divisions but has also an impact on the profitability of the company as a whole.

Concept of Internal Transfer Pricing between Departments of Same Organization under Decentralized Condition

Transfer price should satisfy the following three criteria:

1. They should make possible reliable assessments of divisional performances. [Performance Appraisal]
2. The profit should be set so that the divisional management's desire to maximize divisional earning is consistent with the company as a whole – [Goal Congruence]
3. The prices should ensure that divisional autonomy and authority is preserved. The profits of one division should not be dependent on the action of other division. – [Divisional Autonomy]

Methods of Transfer Pricing

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

Market-Based Transfer Pricing

- Where external markets do exist
  - preferable to use market prices rather than cost-based prices.
- For the receiver department receives the product at the price which has to pay if purchased from outside.
- For the supplier department, market price represents the earning which is lost by the transfer.
- Market price is the best transfer price in the sense that it will maximize the profit of the company as a whole

Market-Based Transfer Pricing

- Two conditions:

(a) There exists a competitive market price.
(b) Divisions are independent of each other.

Market-Based Transfer Pricing

- **Benefits:**

- Fair and an unbiased estimate of the worth of the goods or services
- No required to use sophisticated cost accounting tools to calculate the transfer price
- A ready-made estimated price
- No lead to controversy as to efficiency or inefficiency of the buying and selling division
- Not required to the bargaining process as well
  - save executive time and effort

Full Cost Transfer Pricing

- Transfers are priced at full absorption cost
- It is a full cost plus a profit mark-up method
- It is likely to be treated by the buying division as an input variable cost
- Transfer price of product cover divisional profit and all costs including manufacturing and non-manufacturing

Full Cost Transfer Pricing

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

- Methods:
  - Equation
  - Table

- Equation method

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

Full Cost Transfer Pricing

- Methods: 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 transfer price per unit.

Question 1 (Full Cost Transfer Pricing)

Division X sells to division Y at full cost plus 25% and division Y externally at a similar mark-up. The following data are available.

	Division X	**Division Y**
Variable Cost per Unit	Rs. 10	Rs. 5
Fixed Cost (Based on 1000 units)	Rs. 10,000	Rs. 5,000

Required: (a) Transfer Price per Unit.
(b) Selling Price per Unit of the Product.

Solution 1 (Full Cost Transfer Pricing)

(a) Calculation of Transfer Price Per Unit for Division X

Variable cost per unit = Rs. 10

Fixed cost per unit = Rs. 10,000/1,000 units = Rs. 10

Total Cost = VC + FC = Rs. 10 + Rs. 10 = Rs 20 per unit

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

Transfer Price = Rs. 20 + (Rs. 20 X 25%)

Transfer Price = Rs. 20 + Rs. 5

Transfer Price = Rs. 25 per unit

Solution 1 (Full Cost Transfer Pricing)

(a) Calculation of Transfer Price Per Unit for Division X

Variable cost per unit	10
Fixed cost per unit	10
Total cost per unit	20
Mark-up (Rs. 20 X 25%)	5
Transfer Price	25

Solution 1 (Full Cost Transfer Pricing)

(b) Calculation of Selling Price Per Unit for Division Y

Transfer price per unit from Division X = Rs. 25
Variable cost per unit = Rs. 5
Fixed cost per unit = Rs. 5,000/1,000 units = Rs. 5
Total Cost = Transfer Price + VC + FC = Rs. 25 + Rs. 5 + Rs. 5 = Rs 35 per unit

Selling Price = Total Cost + (Total Cost × Mark-up Percentage)
Selling Price = Rs. 35 + (Rs. 35 X 25%)
Selling Price = Rs. 35 + Rs. 8.75
Selling Price = Rs. 43.75 per unit

Solution 1 (Full Cost Transfer Pricing)

(b) Calculation of Selling Price Per Unit for Division Y

Transfer price from X	Rs. 25.00
Variable cost per unit	5.00
Fixed cost per unit	5.00
Total cost per unit	35.00
Mark-up (Rs. 35 X 25%)	8.75
Transfer Price	43.75

Variable Cost Transfer Pricing

- Transfer price is determined at variable costs
- These costs are direct material, direct labour and variable factory overhead
- This method is very much applicable where the market price is not existed.
  - cost-based transfer pricing is amongst the best one for the company as a whole
- Selling division - performance appraisal becomes meaningless and motivation will be reduced
- More suitable when selling division has excess capacity
  - capacity is not utilized fully (i.e., idle capacity or unused capacity)

Question 2 (Variable Cost Transfer Pricing)

Division x of a company produce 15,000 units components with total variable cost of Rs. 4 per unit and fixed cost of Rs. 40,000. Division y of the same company required 5,000 units of component which it can purchase at Rs. 4.5 per unit from the outside supplier.

Required:

a) Determine whether the company as a whole benefit if Division y purchased the component from outside?

b) If the market price drops to Rs. 3.90 per unit, should Division y purchase from the outside supplier?

Solution 2 (Variable Cost Transfer Pricing)

a) Variable cost per unit = Rs. 4
Purchase price per unit = Rs. 4.50
Differential unit cost = Rs. 4.50 – Rs. 4 = Rs. 0.50 per unit
Saving from internal transfer = 5,000 units × Rs. 0.50 per unit = Rs. 2,500

Decision: Purchase from division X

b) Variable cost per unit = Rs. 4
Purchase price per unit = Rs. 3.90
Differential unit cost = Rs. 4 – Rs. 3.90 = Rs. 0.10 per unit
Saving if purchase from outside = 5,000 units × Rs. 0.10 per unit = Rs. 500

Decision: Purchase from outside

Negotiated Pricing

- Transfer Price - set by negotiation between the buying and selling division.
- Negotiated Pricing Method is generally preferred as a middle solution between cost based and market prices.
- Both receiving and transferring divisions are free to deal either with each other or in the external market and negotiated price with be closed to external market.
- Most suitable for imperfect markets

Negotiated Pricing

The following conditions are fulfilled by Negotiated Pricing Method:

- Transfer price could be set by negotiation between the buying and selling division
- A negotiated price is generally used when there is no clear outside markets
- This method is widely used when no intermediate market price exists for the product transferred and the selling division is assumed of a normal profit

Question 3 (Negotiated Pricing)

Battery Manufacturing Division of ABC Limited produces batteries that it sell primarily to computing machine manufacturing division for inclusion with that division's main product. The 60% of the total batteries production were sold to outside market at a price of Rs. 5 each. The remaining batteries sent to computing machine manufacturing division. Cost data for the Battery manufacturing division are given below:

Production Units	2,00,000 units
Variable Manufacturing Cost	Rs. 600,000
Fixed Manufacturing Overhead	Rs. 100,000
Selling Expenses (All Variable)	Rs. 50,000
Administration Expenses (All Fixed)	Rs. 100,000

Required: Transfer Price for Batteries if the Company uses:

(a) Market Price (b) Variable Cost.

(c) A negotiated transfer price that will yield a mark-up of 20% on its production cost for Battery manufacturing division.

(d) A negotiated transfer price that will yield a mark-up of 10% on its total product cost (full cost) for Battery manufacturing division.

Solution 3 (Negotiated Pricing)

(a) Market Price = Rs. 5 per unit.

(b) Variable Cost : $\frac{\text{Rs. } 6{,}00{,}000 + \text{Rs. } 50{,}000}{2{,}00{,}000 \text{ units}} = \text{Rs. } 3.25 \text{ per unit.}$

(c) Production Cost : $\frac{\text{Rs. } 6{,}00{,}000 + \text{Rs. } 1{,}00{,}000}{2{,}00{,}000 \text{ units}} = \text{Rs. } 3.50 \text{ per unit.}$

Negotiation Transfer Price = Rs. 3.50 + (3.50 × 20%)
= Rs. 4.20 per unit.

(d) Full Cost: $\frac{\text{Rs. } 6{,}00{,}000 + \text{Rs. } 1{,}00{,}000 + \text{Rs. } 50{,}000 + \text{Rs. } 1{,}00{,}000}{2{,}00{,}000 \text{ units}} = \text{Rs. } 4.25 \text{ per unit.}$

Negotiation Transfer Price= Rs. 4.25 + (4.25 × 10%)
= Rs. 4.67 per unit.

General-Transfer-Pricing Rules

- The selling division's opportunity cost is ignoring in all the above methods.
- The transfer price based on opportunity cost identifies the minimum price that a selling division would be willing to accept and maximum price that the buying division will be willing to pay.
- Opportunity cost can be defined as revenue foregone by the company as a whole if the goods and services are transferred internally.
- Opportunity cost is a benefit that is forgone as a result of taking a particular action.

General-Transfer-Pricing Rules

Key Point – Capacity utilization

No Excess Capacity

- The division can sell all of its production to the outside buyer at a market price
- Opportunity cost takes place during the internal transfer.

Excess Capacity

- Excess capacity exists only when more goods can be produced than the producer is able to sell due to low demand for the product
- Opportunity cost is zero.

General-Transfer-Pricing Rules

Transfer Price = Outlay cost per unit + Opportunity cost per unit for the Company as whole.

- Outlay cost includes the direct variable cost of the product or service and any other outlay costs that are incurred only as a result of the transfer.
- Reason - the selling division should be allowed to recover its variable cost-plus opportunity cost of the transfer.
- The selling department should not have to suffer lost income by selling within the company.

Question 4 (General-Transfer-Pricing Rules)

The company's' division A produces bread in its bakery. The division transfers some of its product to the company's division B say café and sales some of its product to other external market.

Production Cost:	
Standard Variable Cost per Bread (Including Packaging)	Rs. 14
Transportation Cost:	
Standard Variable Cost per Bread	Rs. 1

Required: Transfer Price if

(a) No Excess Capacity

(b) Excess Capacity

Solution 4 (General-Transfer-Pricing Rules)

(a) No Excess Capacity

Outlay cost per unit:	**Rs.**
Standard variable cost	14
Standard variable transportation cost	1
	15

Opportunity Cost per Unit:	**Rs.**
Selling price per unit in external market	20
Outlay cost per unit	15
Opportunity cost	5

General-Transfer-Pricing Rules:

Transfer Price = Outlay cost per unit + Opportunity cost per unit

= 15 + 5

= Rs. 20 per unit

Solution 4 (General-Transfer-Pricing Rules)

(b) Excess Capacity

Outlay cost per unit:	**Rs.**
Standard variable cost	14
Standard variable transportation cost	1
	15

Opportunity Cost per Unit:	**Rs.**
Selling price per unit in external market	20
Outlay cost per unit	15
Opportunity cost	5

General-Transfer-Pricing Rules:

Transfer Price = Outlay cost per unit + Opportunity cost per unit

= 15 + 0

= Rs. 15 per unit

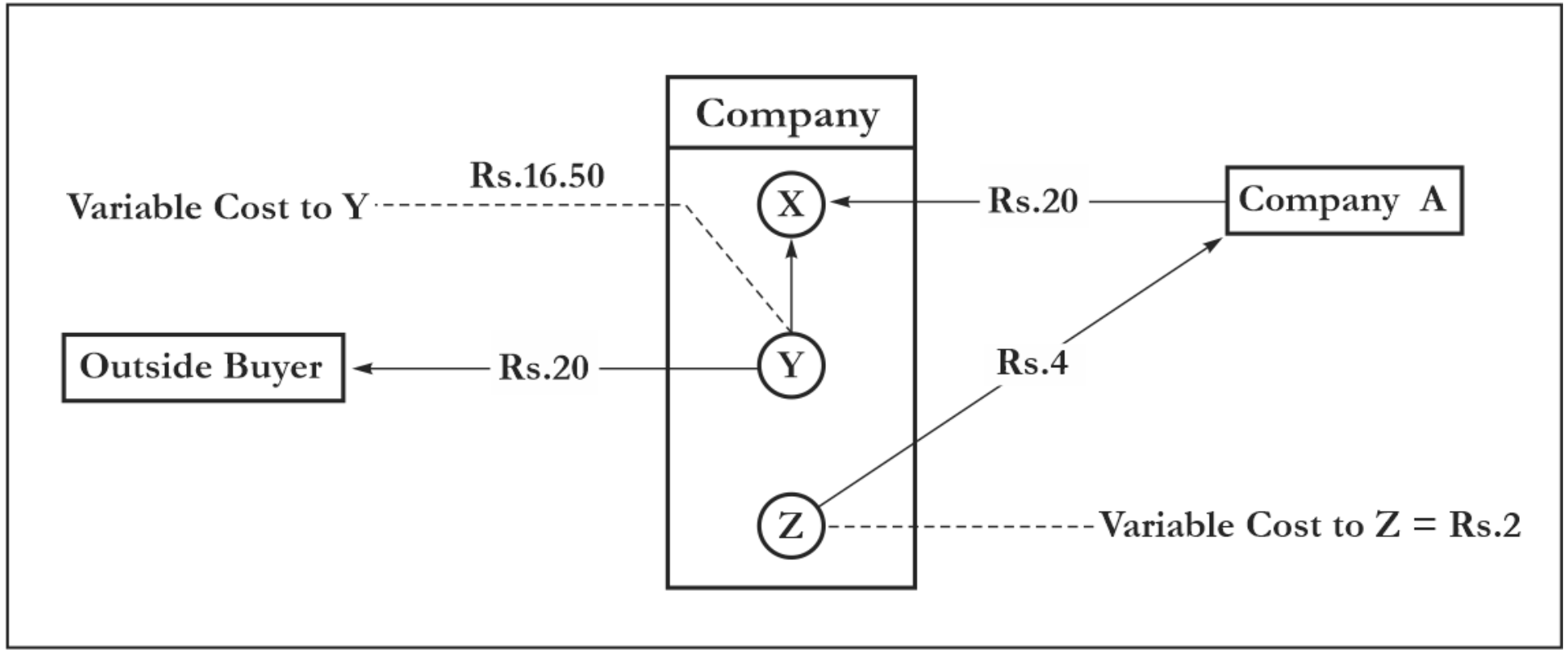
Question 5 (General-Transfer-Pricing Rules)

A company has three divisions: X, Y and Z. Division X can buy a part from division Y or from external company A, which will meet Y's market price of Rs. 20 per unit. If X buys from A co., A co. in terms buys a component from division z for Rs. 4 per unit. The outlay costs to division Z of supplying their component are Rs. 2 per unit. In filling X's order, Y would incur, outlay costs of Rs. 16.5 per unit. Assume that division Y is working at full capacity and can provide to an outside buyer at the same market price of Rs. 20 per unit and with the same outlay costs of Rs. 16.5 per unit.

Required:

i. What alternative would be the best for company as a whole buying from company A or division Y? Show details supporting calculations.
ii. What transfer price should be used to guide the managers of division X and Y so as to maximize overall net income (cash flow)?
iii. Suppose that division Y has enough extra capacity to supply to both division X and the outside buyer at the same time. How would this change your answer in part (i) and (ii)? Show details supporting calculation.

Solution 5 (General-Transfer-Pricing Rules)



Solution 5 (General-Transfer-Pricing Rules)

Working at Full Capacity

i. The optimal action from the standpoint of company as a whole can be analyzed as follows:

	Division X's Action	
	Buy from Division Y	Buy from Co. A
Cash Outflow to the Company as a Whole	(16.50)	(20.00)
Cash Inflows:		
Division Z (4 – 2)	–	2.00
Division Y (20 – 16.5)	–	3.50
Net Cash Outflow to the Company as a Whole	(16.50)	(14.50)

Since a net outflow of Rs. 14.50 is less than a net outflow of Rs. 16.50, division X should buy from Co. A.

ii. Transfer Price = Variable Cost per Unit + Opportunity Cost per Unit
= 16.50 + (3.50 + 2.00)
= Rs. 22 per unit

Since the Market Price Rs. 20 per unit is less than its internal transfer price Rs. 22 per unit, division X should buy from co. A.

Solution 5 (General-Transfer-Pricing Rules)

Working at Below Capacity

iii. In part (i), it was assumed that division Y could supply either division X or co. A, but not both. For this reason an opportunity cost of Rs. 3.5 was included in the calculation. Since, division Y can now supply both division and company A, the Rs. 3.5 appears on both alternatives as follows:

	Division X's Action	
	Buy from Division Y	Buy from Co. A
Cash Outflow of the Company as a Whole	(16.50)	(20.00)
Cash Inflows:		
Division Y (20 – 16.5)	3.50	3.50
Division Z (4 – 2)	–	2.00
Net Cash Outflow to the Company as a Whole	(13.00)	(14.50)

Since a net outflow of Rs. 13 per unit is less than net outflow of Rs. 14.50 per unit, division X should buy inside from division Y, to benefit company as a whole.

Solution 5 (General-Transfer-Pricing Rules)

Working at Below Capacity

Transfer Price = Variable Cost per Unit + Opportunity Cost per Unit

= 16.50 + (0 + 2.00)

= Rs. 18.50 per unit

Since the Market Price Rs. 20 per unit is higher than its internal transfer price Rs. 18.50 per unit, division X should buy from inside division Y, to benefit company as a whole.

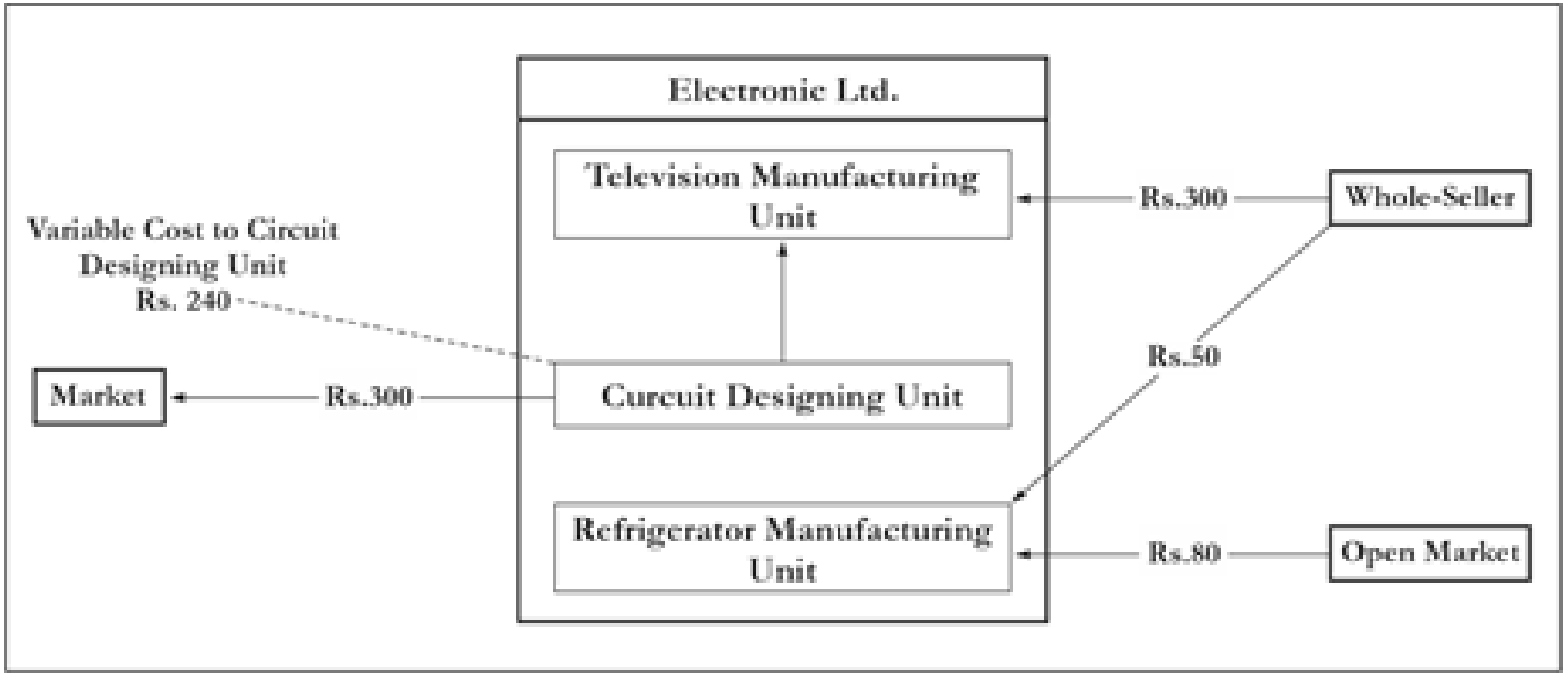
Question 6 (General-Transfer-Pricing Rules)

The Electronics Ltd. has three autonomous units viz. Circuit-designing, Television-manufacturing & Refrigerator-manufacturing enjoying full autonomy. The Television-manufacturing unit either could buy the circuit it would need to produce televisions from the Circuit-designing unit or from a whole seller. The whole seller also supplies 'Thermostat' needed for the manufacturing of refrigerator. If the Television-manufacturing unit would purchase required circuits from Circuit-designing unit, the whole seller would also stop the supply of 'Thermostat'. The further details other than mentioned above have been summarized below:

Circuit-designing Unit	Television-manufacturing Unit	Refrigerator-manufacturing Unit
(a) Transfer Pricing (SP) Cost Plus 25% (b) Cost of Production Rs. 240 per unit	(a) Buying Cost from Whole Seller Rs. 300 per unit	(a) Buying Cost of 'Thermostat' from Whole Seller Rs. 50 (b) Buying Cost from Open Market Rs. 80

Required: 1. Transfer Pricing with no Capacity Constraint.
2. Transfer Price with Capacity Constraint.

Solution 6 (General-Transfer-Pricing Rules)



Solution 6 (General-Transfer-Pricing Rules)

1. Transfer Pricing with no Capacity Constraint:

   Transfer Price = Outlay cost per unit + Opportunity cost per unit
   = Rs. 240 per unit + (Rs. 0 + Rs. 30 per unit)
   = Rs. 270 per unit

2. Transfer Price with Capacity Constraint:

   Transfer Price = Outlay cost per unit + Opportunity cost per unit
   = Rs. 240 per unit + (Rs. 60 per unit + Rs. 30 per unit)
   = Rs. 330 per unit

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