

TRANSFER PRICING

BASIC CONCEPTS AND FORMULA

Basic Concepts

1. Transfer Price

Transfer price is the price which one division of an organisation charges for a product or service supplied to another division of the same organisation.

2. Objectives of Transfer Pricing System

The main-objectives of intra-company transfer pricing are as below:

- i) Emphasis on Profits
- ii) Maximum Utilisation of plant capacity
- iii) Optimise allocation of financial resources

3. Pricing at Cost

In this method the goods and services are transferred at the following costs:

- a. Actual manufacturing cost:
- b. Standard cost
- c. Full cost:
- d. Full cost plus mark up

4. Pricing at market price

Under this method, the transfer prices of goods/services transferred to other units/divisions are based on market prices. Since market prices will, by and large be determined by demand and supply in the long run, it is claimed that profits which results under this method, will provide a good indicator of the overall efficiency of the various units.

5. Bargained or Negotiated Prices

Under this method each decentralised unit is considered as an independent unit and such units decide the transfer price by negotiations or bargaining. Divisional managers have full freedom to purchase their requirement from outside if the

prices quoted by their sister unit are lower.

6. Multinational Transfer Pricing

Multinational companies use transfer prices to minimize worldwide income taxes, import duties, and tariffs. By setting a low transfer price, the company can recognize most of the profit from the production in the low-income-tax-rate country, thereby minimizing taxes. Likewise, items produced by divisions in a low-income-tax-rate country and transferred to a division in a high-income-tax-rate country should have a high transfer price to minimize taxes. Sometimes import duties offset income tax effects

Question 1

A company is engaged in the manufacture of edible oil. It has three divisions as under:

- (i) Harvesting oil seeds and transportation thereof to the oil mill.*
- (ii) Oil Mill, which processes oil seeds and manufactures edible oil.*
- (iii) Marketing Division, which packs the edible oil in 2 kg. containers for sale at Rs.150 each container.*

The Oil Mill has a yield of 1,000 kgs of oil from 2,000 kg of oil seeds during a period. The Marketing Division has a yield of 5,000 cans of edible oil of 2 kg each from every 1,000 kg of oil. The net weight per can is 2 kgs of oil.

The cost data for each division for the period are as under:

Harvesting division

<i>Variable cost per kg of oil seed</i>	<i>Rs.2.50</i>
<i>Fixed cost per kg of oil seed</i>	<i>Rs.5.00</i>

Oil Mill Division:

<i>Variable cost of processed edible oil</i>	<i>Rs.10.00 per kg</i>
<i>Fixed cost of processed edible oil</i>	<i>Rs.7.50 per kg</i>

Marketing Division:

<i>Variable cost per can of 2 kg of oil</i>	<i>Rs.3.75</i>
<i>Fixed cost per can of 2 kg of oil</i>	<i>Rs.8.75</i>

The fixed costs are calculated on the basis of the estimated quantity of 2,000 kg of oil seeds harvested, 1,000 kg of processed oil and 500 cans of edible oil packed by the aforesaid divisions respectively during the period under review.

The other oil mills buy the oil seeds of same quality at Rs.12.50 per kg in the market. The market price of edible oil processed by the oil mill, if sold without being packed in the marketing division is Rs.62.50 per kg of oil.

Required:

- (i) Compute the overall profit of the company of harvesting 2,000 kg of oil seeds, processing it into edible oil and selling the same in 2 kg cans as estimated for the period under review.
- (ii) Compute the transfer prices that will be used for internal transfers from (1) Harvesting Division to Oil Mill Division and (2) from Oil Mill Division to Marketing Division under the following pricing methods:
 - (1) Shared contribution in relation to variable costs; and
 - (2) Market price.
- (iii) Which transfer pricing method will each divisional manager prefer to use?

Answer

(i) Statement of the overall profit of the company						
(By harvesting 2,000 kgs of oil seeds, processing it into edible oil & selling the same in 2 kg cans)						
	Output of each department	Harvesting Division	Oil Mill Division	Marketing Division	Total Rs.	
	2,000 kgs of oil seed	1,000 kgs. of oil produced	500 cans of 2 kg each			
Total costs						
Variable cost (Rs.) : (A)		5,000	10,000	1,875		16,875
		(2,000 kgs × Rs.2.50)	(1,000 kgs × Rs.10)	(500 × Rs.3.75)		
Fixed cost (Rs.): (B)		10,000	7,500	4,375		21,875
		(2,000 kgs × Rs.5)	(1,000 kgs × Rs.7.50)	(500 × Rs.8.75)		
Total cost (Rs.): (C) = [(A)+(B)]		15,000	17,500	6,250		38,750
Sales revenue (Rs.): (D)						75,000
(500 cans × Rs.150)						
Profit (Rs.) [(D) – (C)]						36,250

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(ii) Working note:

(a) Total Contribution = (Sales revenue – total variable cost)
= Rs.75,000 – Rs.16,875 = Rs.58,125

(b) Amount of shared contribution in relation to variable costs:

Harvesting Division = $\text{Rs.}58,125 \times \frac{\text{Rs.}5,000}{\text{Rs.}16,875} = \text{Rs.}17,222$

Oil Mill Division = $\text{Rs.}58,125 \times \frac{\text{Rs.}10,000}{\text{Rs.}16,875} = \text{Rs.}34,445$

Marketing Division = $\text{Rs.}58,125 \times \frac{\text{Rs.}1,875}{\text{Rs.}16,875} = \text{Rs.}6,458$

Computation of Transfer Price (for internal transfers) under the following pricing methods:

(1) Shared contribution in relation to variable costs:

Transfer price from harvesting Division to Oil Mill Division

= Variable cost of Harvesting Division + Shared contribution of Harvesting Division in relation to variable costs

= Rs.5,000 + Rs.17,222 (Refer to working note 2) = Rs.22,222

Transfer price from Oil Mill Division to Marketing Division

= Transfer price from Harvesting Division to Oil Mill Division + Variable cost of Oil Mill

Division + Shared contribution of Oil Mill Division in relation to variable costs
(Refer to working note 2)

= Rs.22,222 + Rs.10,000 + 34,445

= Rs.66,667

(2) Market price:

Transfer price from Harvesting Division to Oil Mill Division

= Market price of 2,000 kgs of Oil seeds transferred to Oil Mill Division

= 2,000 kgs. × Rs.12.50 = Rs.25,000

Transfer price from Oil Mill Division to Marketing Division

= Market price of 1,000 kgs of edible oil

= 1,000 of kgs × Rs.62.50 – Rs.62,500

(iii) Statement of profitability (under different transfer prices method)

	<i>From Harvesting Division to Oil Mill Division</i>	<i>From Oil Mil to Marketing Division</i>	<i>From Marketing Division to market (500 cans of 2 Kgs.)</i>
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Shared contribution method			
Transfer price:	22,222	66,667	75,000
(Refer to (1) above)			
Less: Transfer price	—	22,222	66,667
(Refer to (ii) above)			
Less: Variable cost	5,000	10,000	1,875
Less: Fixed cost	10,000	7,500	4,375
(Refer to (i) above)			
Profit	7,222	26,945	2,083
Market price method			
Transfer price	25,000	62,500	75,000
(Refer to (2) above)			
Less: Transfer in price	—	25,000	62,500
(Refer to (ii) above)			
Less: Variable cost	5,000	10,000	1,875
(Refer to (ii) above)			
Less: Fixed cost	10,000	7,500	4,375
(Refer to (i) above)			
Profit	10,000	20,000	6,250

Decision: Divisional Manager of Harvesting Division would prefer the use of market price method for transferring 2,000 kgs of oil seeds to Oil Mill Division because its usage increases the profit by Rs.2,778 (Rs.7,222) over the shared contribution method.

Whereas Oil Mill Division manager would prefer the use of shared contribution method over the market price method because its use would increase its profit by

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Rs.6,945 (Rs.26,945 – Rs.20,000). Similarly Marketing Divisional Manager would be benefited to the extent of Rs.4,167 (Rs.6,250 – Rs.2,083) by using market price method.

Question 2

Indicate the possible disadvantages of treating divisions as profit centres.

Answer

The Possible disadvantages of treating divisions as profit centres are as follows:

1. Divisions may compete with each other and may take decisions to increase profits at the expense of other divisions thereby overemphasizing short term results.
2. It may adversely affect co-operation between the divisions and lead to lack of harmony in achieving organizational goals of the company. Thus it is hard to achieve the objective of goal congruence.
3. It may lead to reduction in the company's overall total profits.
4. The cost of activities, which are common to all divisions, may be greater for decentralized structure than centralized structure. It may thus result in duplication of staff activities.
5. Top management loses control by delegating decision making to divisional managers. There are risks of mistakes committed by the divisional managers, which the top management, may avoid.
6. Series of control reports prepared for several departments may not be effective from the point of view of top management.
7. It may under utilize corporate competence.
8. It leads to complications associated with transfer pricing problems.
9. It becomes difficult to identify and define precisely suitable profit centres.
10. It confuses division's results with manager's performance.

Question 3

The two manufacturing divisions of a company is organized on profit centre basis. Division X is the only source of a component required by Division Y for their product 'P'. Each unit of P requires one unit of the said component. As the demand of the product is not steady, orders for increased quantities can be obtained by manipulating prices.

The manager of Division Y has given the following forecast:

Sales per day (Unit)	Average price per unit of P (Rs.)
5,000	393.75

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10,000	298.50
15,000	247.50
20,000	208.50
25,000	180.00
30,000	150.75

The manufacturing cost (excluding the cost of the component from Division X) of P in Division Y is Rs.14,06,250 on first 5,000 units and Rs.56.25 per unit in excess of 5,000 units.

Division X incurs a total cost of Rs.5,62,500 per day for an output upto 5,000 components and the total costs will increase by Rs.3,37,500 per day for every additional 5,000 components manufactured. The Manager of Division X has set the transfer price for the component at Rs.90 per unit to optimize the performance of his Division.

Required:

- (i) Prepare a divisional profitability statement at each level of output, for division X and Y separately;
- (ii) Find out the profitability of the company as a whole at the output level where:
 - (a) Division X's net profit is maximum;
 - (b) Division Y's net profit is maximum.
- (iii) Find out at what level of output, the company will earn maximum profit, if the company is not organized on profit centre basis.

Answer

(i) Statement of profitability of Division X

No. of components	Transfer price for the component to Department Y @ Rs.90 per unit	Total cost of components (Rs.)	Profit / (Loss) (Rs.)
(a)	(b)	(c)	(d) = {(b) – (c)}
5,000	4,50,000	5,62,500	(1,12,500)
10,000	9,00,000	9,00,000	—
15,000	13,50,000	12,37,500	1,12,500
20,000	18,00,000	15,75,000	1,25,000
25,000	22,50,000	19,12,500	3,37,500
30,000	27,00,000	22,50,000	4,50,000

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Statement of profitability of Division Y

No. of Components	Sale revenue on average price basis	Component cost (Transfer price) to Dept. Y	Manufacturing cost in division Y	Total cost	Profit/(Loss)
	Rs.	Rs.	Rs.	Rs.	Rs.
(a)	(b)	(c)	(d)	(e)={ (c)+(d) }	(f)={ (b)-(e) }
5,000	19,68,750	4,50,000	14,06,250	18,56,250	1,12,500
10,000	29,85,000	9,00,000	16,87,500	25,87,500	3,97,500
15,000	37,12,500	13,50,000	19,68,750	33,18,750	3,93,750
20,000	41,70,000	18,00,000	22,50,000	40,50,000	1,20,000
25,000	45,00,000	22,50,000	25,31,250	47,81,250	(2,81,250)
30,000	45,00,000	27,00,000	28,12,500	55,12,500	(9,90,000)

(ii) Profitability of the company as a whole

(a)	At 30,000 units level, at which Division X's net profit is maximum	Rs.
	Profit of Division X	4,50,000
	Profit of division Y	<u>(9,00,000)</u>
	Operating profitability / (Loss) of the company	<u>(5,40,000)</u>
(b)	At 10,000 units level, at which Division Y's net profit is maximum	Rs.
	Profit of division X	NIL
	Profit of division Y	<u>3,97,500</u>
	Operating profitability of the company	<u>3,97,500</u>

(iii) Profitability of the company, if it is not organised on profit centre basis

No. of components	Sales revenue on average basis	Cost of component to division X	Manufacturing cost in division Y	Total cost	Profit/ (Loss)
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
(a)	(b)	(c)	(d)	(e)={ (c) + (d) }	(f)={ (b)-(e) }
5,000	19,68,750	5,62,500	14,06,250	19,68,750	-

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10,000	29,85,000	9,00,000	16,87,500	25,87,500	3,97,500
15,000	37,12,500	12,37,500	19,68,750	32,06,250	5,06,250
20,000	41,70,000	15,75,000	22,50,000	38,25,000	3,45,000
25,000	45,00,000	19,12,500	25,31,250	44,43,750	56,250
30,000	45,22,500	22,50,000	28,12,500	50,62,500	(5,40,000)

The level of output, the company will earn maximum profit, if the company is not organized on profit centre basis is 15,000 components.

Question 4

Tycon Ltd. has two manufacturing departments organized into separate profit centres known as Textile unit and Process House. The Textile unit has a production capacity of 5 lacs metres cloth per month, but at present its sales is limited to 50% to outside market and 30% to process house.

The transfer price for the year 2004 was agreed at Rs. 6 per metre. This price has been fixed in line with the external wholesale trade price on 1st January, 2004. However, the price of yarn declined, which was the raw material of textile unit, with effect, that wholesale trade price reduced to Rs. 5.60 per metre with effect from 1st June, 2004. This price was however not made applicable to the sales made to the processing house of the company. The textile unit turned down the processing house request for revision of price.

The Process house refines the cloth and packs the output known as brand Rayon in bundles of 100 metres each. The selling price of the Rayon is Rs. 825 per bundle. The process house has a potential of selling a further quantity of 1,000 bundles of Rayon provided the overall price is reduced to Rs. 725 per bundle. In that event it can buy the additional 1,00,000 metres of cloth from textile unit, whose capacity can be fully utilised. The outside market has no further scope.

The cost data relevant to the operations are:

	Textile unit Rs.	Process house Rs.
Raw material (per metre) on 1 st June, 2004	3.00	Transfer price
Variable cost	1.20 (per metre)	80 (per bundle)
Fixed cost (per month)	4,12,000	1,00,000

You are required to:

- (i) *Prepare statement showing the estimated profitability for June, 2004 for Textile unit and Process house and company as a whole on the following basis:*

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- (a) At 80% and 100% capacity utilisation of the Textile unit at the market price and the transfer price to the Processing house of Rs. 6 per metre.
- (b) At 80% capacity utilisation of the Textile unit at the market price of Rs. 5.60 per metre and the transfer price to the Processing house of Rs. 6 per metre.
- (c) At 100% capacity utilisation of the Textile unit at the market price of Rs. 5.60 per metre and the transfer price to the Processing house of Rs. 5.60 per metre.
- (ii) Comment on the effect of the company's transfer pricing policy on the profitability of Processing house.

Answer

- (i) (a) At 80% level (in Rs)

-Textile unit		-Process house	
Sales (4,00,000 × 6)	24,00,000	Sales (1,50,000/100) × 825	12,37,500
Less		Less	
Raw material (4,00,000 × 3)	12,00,000	Transfer Price (1,50,000 × 6)	9,00,000
Variable cost (4,00,000 × 1.2)	4,80,000	Variable cost (1,500 × 80)	1,20,000
Fixed cost	4,12,000	Fixed cost	1,00,000
Profit	3,08,000	Profit	1,17,500

Overall profit = 3,08,000 + 1,17,500 = Rs 4,25,500

At 100% level

Sales (5,00,000 × 6)	30,00,000	Sales (2,50,000/100) × 725	18,12,500
Less		Less	
Raw material (5,00,000 × 3)	15,00,000	Transfer Price (2,50,000 × 6)	15,00,000
Variable cost (5,00,000 × 1.2)	6,00,000	Variable cost	2,00,000
Fixed cost	4,12,000	Fixed cost	1,00,000
Profit	4,88,000	Profit	12,500

Overall profit = 4,88,000 + 12,500 = Rs 5,00,500

- (b) At 80% level (market price 5.60 and transfer price 6/-) (in Rs)

Textile unit	Process house
Sale (2,50,000 × 5.6)	1400000

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(1,50,000 × 6.0)	900000		
	23,00,000		
Less			
Raw material (4,00,000 × 3)	12,00,000		
Variable cost (4,00,000 × 1.2)	4,80,000		
Fixed cost	4,12,000		
Profit	2,08,000	Profit	1,17,500
Overall profit = 2,08,000 + 1,17,500 = Rs 3,25,500			

(c) Sales 100% level at (5.60) (in Rs)

Sale (5,00,000 × 5.6)	28,00,000	Sales (2,50,000 × 725)	18,12,500
Less		Less	
Raw material (5,00,000 × 3)	15,00,000	Transfer Profit (2,50,000 × 5.6)	14,00,000
Variable cost (5,00,000 × 1.20)	6,00,000	Variable cost (2,500 × 80)	2,00,000
Fixed cost	4,12,000	Fixed cost	1,00,000
Profit	2,88,000	Profit	1,12,500

Overall profit = 2,88,000 + 1,12,500 = 4,00,500

(ii) Comments on the profitability of processing units:-

	Transfer price (Rs)	Profit (Rs)
(a) 80% capacity	6.00	1,17,500
100% capacity	6.00	12,500
(b) 80% capacity	6.00	1,17,500
(c) 100% capacity	5.60	1,12,500

Processing house will not be interested to buy more than 1,50,000 meters from textile units.

Question 5

AB Cycles Ltd. has 2 divisions, A and B which manufacture bicycle. Division A produces bicycle frame and Division B assembles rest of the bicycle on the frame. There is a market for sub-assembly and the final product. Each division has been treated as a profit

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centre. The transfer price has been set at the long-run average market price. The following data are available to each division:

Estimated selling price of final product	Rs. 3,000 p.u.
Long run average market price of sub-assembly	Rs. 2,000 p.u.
Incremental cost of completing sub-assembly in division B	Rs. 1,500 p.u.
Incremental cost in Division A	Rs. 1,200 p.u.

Required:

- (i) If Division A's maximum capacity is 1,000 p.m. and sales to the intermediate are now 800 units, should 200 units be transferred to B on long-term average price basis.
- (ii) What would be the transfer price, if manager of Division B should be kept motivated?
- (iii) If outside market increases to 1,000 units, should Division A continue to transfer 200 units to Division B or sell entire production to outside market?

Answer

- (i) In this case there are two options available –

(a)	Sell at the sub assembly stage (after completion of Div. A) @ Rs. 2000/-	
	Incremental cost in Div. A	Rs 1,200/-
	Contribution	Rs 800/-
(b)	Sell at the final product stage	Rs. 3,000
	Cost at Div. A and Div. B Rs(1200+1500)	Rs 2,700
	Contribution	Rs 300

Therefore it is profitable to sell at the subassembly stage because of higher contribution, provided there is a market.

Hence, if there is market at intermediate stage, first priority is to sell intermediary (sub assembly). Therefore, 800 units should be sold as sale of intermediary.

The balance capacity available of $(1000 - 800) = 200$ units should be transferred to B and B should complete the assembly and sell as final product, since the company can earn Rs. 300 per unit for each unit of such sale.

- (ii) If B Div. receives the subassembly at market price of Rs. 2,000, plus its own incremental cost of Rs. 1,500 will give total cost of Rs. 3,500, thereby yielding a

loss of Rs. 3500 – Rs. 3000 = Rs. 500 per unit, whereas the company makes a profit of Rs. 300 per unit.

In order to keep the manager of Div. B motivated, the profit earned of Rs. 300 per unit should be shared between A and B. Hence transfer price will be variable cost of Div. A + 50% of profit earned in the final product = 1200 + 150 = Rs. 1,350

- (iii) Both Div. A and the Company make higher contribution by selling to intermediate market. If the market demand increases to 1,000 units, the full quantity should be sold outside as intermediary and nothing should be transferred to Div. B.

Question 6

What are some goals of a 'transfer-pricing' system in an organization?

Answer

The goals of transfer pricing are that it should:

1. provide information that motivates divisional managers to take good economic decisions which will improve the divisional profits and ultimately the profits of the company as a whole.
2. provide information which will be useful for evaluating the divisional performance.
3. seek to achieve goal congruence.
4. ensure that divisional autonomy is not undermined.

Question 7

Division Z is a profit center which produces four products A, B, C and D. Each product is sold in the external market also. Data for the period is:

	A	B	C	D
Market price per unit (Rs.)	150	146	140	130
Variable cost of pdn. Per unit (Rs.)	130	100	90	85
Labour hours required per unit	3	4	2	3

Product D can be transferred to division Y, but the maximum quantity that may be required for transfer is 2,500 units of D.

The maximum sales in the external market are:

A	2,800 units
B	2,500 units
C	2,300 units
D	1,600 units

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Division Y can purchase the same product at a price of Rs. 125 per unit from outside instead of receiving transfer of product D from Division Z.

What should be the transfer price for each unit for 2,500 units of D, if the total labour hours available in division Z are 20,000 hours?

Answer

Ranking of products when availability of time is the key factor

Products	A	B	C	D
Market price	150	146	140	130
Less: Variable cost	130	100	90	85
Contribution p.u. (Rs.)	20	46	50	45
Labour hours p.u.	3	4	2	3
Contribution/labour hour	6.66	11.5	25	15
Ranking	IV	III	I	II
Maximum demand (units)	2,800	2,500	2,300	1,600
Total No of hours	8,400	10,000	4,600	4,800
Allocation of 20,000 hours on the basis of ranking	600*	10,000	4,600	4,800

*Balancing figure

Note: Time required meeting the demand of 2,500 units of product D for division Y is 7,500 hours. This requirement of time viz, 7,500 hours for providing 2,500 units of product D for division Y can be met by sacrificing 600 hours of Product A (200 units) and 6,900 hours of Product B (1,725 units)

Transfer Price = Variable cost + Opportunity cost

$$\text{Or } \frac{\text{Rs}85 + (\text{Rs}6,900 \times 11.5 + 600 \times 6.66)}{2,500} = \frac{\text{Rs}.85 + (79350 + 4000)}{2500}$$

$$= \text{Rs } (85 + 33.34) = \text{Rs } 118.34$$

Question 8

X Ltd. has two divisions, A and B, which manufacture products A and B respectively. A and B are profit centres with the respective Divisional Managers being given full responsibility and credit for their performance.

Transfer Pricing

The following figures are presented:

	Division A	Division B	
	Rs. Per Unit	Rs. Per Unit	
Direct material cost	50	24*	*(other than A)
Material A, if transferred from Division A	—	144	
Material A, if purchased from outside	—	160	
Direct labour	25	14	
Variable production overhead	20	2	
Variable selling overhead	13	26	
Selling price in outside market	160	300	
Selling price to B	144	—	
Selling price to S Ltd.	—	250	

Other Information:

To make one unit of B, one unit of component A is needed. If transferred from A, B presently takes product A at Rs.144 per unit, with A not incurring variable selling overheads on units transferred to B.

Product A is available in the outside market at Rs. 160 per unit from competitors.

B can sell its product B in the external market at Rs. 300 per unit, whereas, if it supplied to X Ltd.'s subsidiary, S Ltd., it supplies at Rs. 250 per unit, and need not incur variable selling overhead on units transferred to S Ltd. S Ltd. requires 6,000 units and stipulates a condition that either all 6,000 units be taken from B or none at all.

	A(units)	B(units)	
Manufacturing capacity	20,000	28,000	
Demand in external market	18,000	26,000	
S Ltd.'s demand	—	6,000	or zero

Assume that Divisions A and B will have to operate during the year.

What is the best strategy for:

- Department A?
- Department B, given that A will use its best strategy?
- For X Ltd. As a whole?

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Answer

	<i>Div A</i>	<i>B</i>	<i>B</i>
	<i>Rs. / unit</i>	<i>Rs. / unit</i>	<i>Rs. / unit</i>
Direct Material (Other than A)	50	24	
Direct Labour	25	14	
Variable Overhead (Production)	<u>20</u>	<u>2</u>	
Variable Production Cost (excl. A)	95	40	40
From A		144	
From Outside		_____	<u>160</u>
Variable production Cost / unit		184	200
Selling Price			
From outside	160	300	
Less: Selling Overhead	<u>13</u>	<u>26</u>	
Net Selling Price (outside)	<u>147</u>	<u>274</u>	
Net Selling Price to B	<u>144</u>		
Net Selling Price to S		<u>250</u>	
Net Selling Price (outside)	147	274	274
Variable Production Cost	<u>- 95</u>	<u>- 184</u>	<u>-200</u>
Contribution / unit (outside)	52	90	74
(Sale to B & S respectively)	144	250	250
Variable Production Cost	<u>-95</u>	<u>-184</u>	<u>-200</u>
Contribution / unit	<u>49</u>	<u>66</u>	<u>50</u>

Best strategy

A = Maximise Production; Sell maximum no. of units @ $18,000 \times 52 = 9,36,000$
52 / unit (outside)

(To B) remaining units

$2,000 \times 49 = \underline{98,000}$

Total Contribution for A

10,34,000

Best strategy for B:

Maximise contribution / unit by selling outside and procuring from A 90 / unit

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Contribution $\times$ 2,000 units

Balance units can yield contribution of either 74/ unit for outside or Rs. 50 / unit to S Ltd.

Production Capacity = 28,000.

	Option I	Option II
Outside Sales	Sales to S	Outside Sales $\times$ contribution / unit
$20,000 \times 74 = 14,80,000$	$6,000 \times 50 = 3,00,000$	$24,000 \times 74 = 17,76,000$
$2,000 \times 90 = 1,80,000$		$2,000 \times 90 = 1,80,000$
16,60,000	3,00,000	
Total Contribution	(16,60,000 + 3,00,000) 19,60,000	19,56,000

- (B) Choose Option I i.e. get 2,000 units from A, sell 6,000 units to S and 20,000 to outside. Make 28,000 units @ full capacity. Total Contribution Rs19,60,000.

If A and B are allowed to act independent of the group synergy,

Rs.

Total contribution	A – 10,34,000
	B – <u>19,60,000</u>
Total contribution for X Ltd.	<u>29,94,000</u>

Cost from X Ltd.'s Perspective

Variable Cost of production	Div A	Rs. 95	
	Div B		
Variable cost of production other than A	40	40	
A supplied by Division	95		
A – Variable Cost			
A purchased	<u>135</u>	<u>160</u>	
		<u>200</u>	
Option I	Outside 26,000 units	Option II	
Outside $20,000 \times (274 - 135)$	27,80,000	$20,000 (274 - 135)$	27,80,000
<u>$2,000 \times (274 - 200)$</u>	1,48,000	$6,000 (274 - 200)$	<u>4,44,000</u>
22,000			

Advanced Management Accounting

S Ltd. 6,000 units (250 – 200)	<u>3,00,000</u>	
	<u>32,28,000</u>	<u>32,24,000</u>

Choose Option I

Contribution = Rs. 32,28,000 for X Ltd. as a whole

Transfer (2,000 units)

Make A transfer all output to B. Sell 6,000 units of B to S and 22,000 units to outside market. This will make X Ltd. better off by $32,28,000 - 29,94,000 = \text{Rs } 2,34,000$

(i.e. 18,000 units of A sold to outside increases contribution to A by 3 Rs. / unit and decreases contribution to B by 16 Rs. / unit Net negative effect = $13 \times 18,000 = \text{Rs. } 2,34,000$).

Question 9

A large business consultancy firm is organized in to several divisions. One of the divisions is the Information Technology (IT) division which provides consultancy services to its clients as well as to the other divisions of the firm. The consultants in the IT divisions always work in a team of three professional consultants on each day of consulting assignment. The external clients are charged a fee at the rate of Rs. 4,500 for each consulting day. The fee represents the cost plus 150% profit mark up. The break up of cost involved in the consultancy fee is estimated at 80% as being variable and the balance is fixed.

The textiles division of the consultancy firm which has undertaken a big assignment requires the services of two teams of IT consultants to work five days in a week for a period of 48 weeks. While the director of the textiles division intends to negotiate the transfer price for the consultancy work, the director of IT division proposes to charge the textiles division at Rs. 4,500 per consulting day.

In respect of the consulting work of the textiles division, IT division will be able to reduce the variable costs by Rs. 200 per consulting day. This is possible in all cases of internal consultations because of the use of specialized equipment.

You are required to explain the implications and set transfer prices per consulting day at which the IT division can provide consultancy services to the textiles division such that the profit of the business consultancy firm as a whole is maximized in each of the following scenarios:

- (i) *Every team of the IT division is fully engaged during the 48 week period in providing consultancy services to external clients and that the IT division has no spare capacity of consultancy teams to take up the textiles division assignment.*

- (ii) IT division will be able to spare only one team of consultants to provide services to the textiles division during the 48 week period and all other teams are fully engaged in providing services to external clients.
- (iii) A new external client has come forward to pay IT division a total fee of Rs. 15,84,000 for engaging the services of two teams of consultants during the aforesaid period of 48 weeks.

Answer

Transfer Price is Rs. 4,500 for each consulting day.

Profit mark-up = 150%

Let cost = x

$$\begin{aligned}\text{Profit} &= x \times \frac{150}{100} \\ &= 1.5x\end{aligned}$$

Cost + profit = Transfer price

$$\Rightarrow x + 1.5x = 4,500$$

$$\Rightarrow 2.5x = 4,500$$

$$\Rightarrow x = \frac{4,500}{2.5} = 1,800$$

$\therefore$ Cost = Rs. 1,800

and profit = $1.5x = 1.5 \times 1,800$
= Rs. 2,700

Variable cost (80%) = Rs. $1,800 \times 80\%$
= Rs. 1,440

Fixed cost (20%) = Rs. $1,800 \times 20\%$
= Rs. 360.

Scenario (i):

Every consultancy team is fully engaged. There is no idle time or spare capacity.

Hence, transfer price = Marginal cost plus opportunity cost

Marginal cost = Rs. 1,440

Saving for internal work = Rs. 200

Advanced Management Accounting

Net Marginal Cost = Rs. 1,240

Opportunity cost is the lost contribution.

Lost contribution = Contribution from external client

= Fee charged from external client – Variable cost

= Rs. (4,500 – 1,440)

= Rs. 3,060.

∴ Transfer price = Rs. 1,240 + 3,060

= Rs. 4,300 per consulting day per team.

Scenario (ii):

One team is idle. Idle time has no opportunity cost. Variable cost for internal work is Rs. 1,240 per consulting day. Second team is busy. Hence opportunity cost is relevant in case of second team. Hence charge of second team is Rs. 4,300 per consulting day per team.

Average of charge of two teams = Rs. (1,240 + 4,300) / 2

= Rs. 2,770 per consulting day per team.

Scenario (iii):

New client offers a fee of Rs. 15,84,000

Duration: 5 days of 48 weeks × 2 teams = 480 days

Fee per day 15,84,000 / 480 = Rs. 3,300

Variable cost = Rs. 1,440

Contribution Rs. (3,300 – 1,440) = Rs. 1,860

Fee for consulting day for internal work:

Variable cost = Rs. 1,240

Contribution lost = Rs. 1,860

Fee to be charged = Rs. 3,100 per consulting day per team.

Question 10

Tripod Ltd. has three divisions – X, Y and Z, which make products X, Y and Z respectively. For division Y, the only direct material is product X and for Z, the only direct material is product Y. Division X purchases all its raw material from outside. Direct selling overhead, representing commission to external sales agents are avoided on all internal transfers.

Transfer Pricing

Division Y additionally incurs Rs. 10 per unit and Rs. 8 per unit on units delivered to external customers and Z respectively. Y also incurs Rs. 6 per unit picked up from X, whereas external suppliers supply at Y's factory at the stated price of Rs. 85 per unit.

Additional information is given below:

	Figures Rs./unit		
	X	Y	Z
Direct materials (external supplier rate)	40	85	135
Direct labour	30	50	45
Sales Agent's commission	15	15	10
Selling price in external market	110	170	240
Production capacity	20,000	30,000	40,000 units
External demand	14,000	26,000	42,000 units

You are required to discuss the range of negotiation for Managers X, Y and Z, for the number of units and the transfer price for internal transfers.

Answer

Analysis of range of negotiation for Manager of Division X

(Figures in Rs.)

(a)

Division X

↓

↓

Outside sales

Sales to Y (Range)

Selling Price	110	70	—	79
(–) Commission	<u>15</u>	—		<u>—</u>
Net Selling Price	95	70	—	79
Variable Cost	<u>70</u>	<u>70</u>	—	<u>70</u>
Contribution per unit	25	0		9
Units	14,000	6,000		6,000
Total contribution				
(Units × Contribution per unit)	3,50,000	0		54,000

Analysis of Range of negotiation for Manager of Division Y

Advanced Management Accounting

(Figures in Rs.)

	Division Y						
	Outside Sales			Sale to Z			
	From A	From outside		From A	From outside		
Price range	— 70	79	85	70	79	85	
Add: Transport	<u>6</u>	<u>6</u>	—	<u>6</u>	<u>6</u>	—	
	76	85	85	76	85	85	
Add: Direct Labour	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	
	126	135	135	126	135	135	
Add: Delivery cost	<u>10</u>	<u>10</u>	<u>10</u>	<u>8</u>	<u>8</u>	<u>8</u>	
	136	145	145	134	143	143	
Add: Sales Commission	<u>15</u>	<u>15</u>	<u>15</u>	—	—	—	
Total Cost	151	160	160	134	143	143	
Selling Price	<u>170</u>	<u>170</u>	<u>170</u>	<u>134</u>	<u>135</u>	<u>135</u>	
Contribution	19	10	10	<u>0</u>	<u>+1</u>	<u>(-) 8</u>	<u>(-) 8</u>

Range of Negotiations:

Manager of division X will sell 14,000 units outside at 110 Rs. per unit and earn contribution of Rs. 3.50 lakhs.

Excess capacity of 6,000 units can be offered to Y at a price between 70 (the variable manufacturing cost at X) and Rs. 95 (the maximum amount to equal outside contribution). But Y can get the material outside @ 85. So, y will not pay to X anything above (Rs.85 – 6) = Rs. 79 to match external available price.

X will be attracted to sell to Y only in the range of 71 – 79 Rs. per unit at a volume of 6,000 units.

At Rs. 70, X will be indifferent, but may offer to sell to Y to use idle capacity.

Transfer Pricing

Z will not buy from Y at anything above 135. If X sells to Y at 70 per unit, Y can sell to Z at 134 and earn no contribution, only for surplus capacity and if units transferred by X to Y at Rs. 70 per unit.

	Y	Z
Provided X sells to Y at Rs. 70 per unit	Sell 4,000 units to Z at 134 (Indifferent)	Buy 4,000 units from y at 134 (attracted)
	Sell 4,000 units to Z at 135 (willingly for a contribution of Re. 1)	Indifferent, since market price is also 135

For buying from X at 71 – 79 price range, Y will be interested in selling to Z only at prices 136 – 143, which will not interest Z.

Thus Y will sell to Z only if X sells to Y at Rs. 70 per unit and Y will supply to Z maximum 4,000 units.

Question 11

Bearings Ltd. makes three products, A, B and C in Divisions A, Band C respectively. The following information is given:

	A	B	C
<i>Direct Materials (excluding material A for Divisions B and C)</i>	4	15	20 Rs./u
<i>Direct Labour</i>	2	3	4 Rs./u
<i>Variable overhead</i>	1	1	1 Rs./u
<i>Selling price to outside customers</i>	15	40	50 Rs./u
<i>Existing Capacity</i>	5,000	2,500	2,500 (No. of units)
<i>Maximum External demand</i>	3,750	5,000	4,000 (No. of units)
<i>Additional fixed costs that would be incurred to install additional capacity</i>	24,000	6,000	18,700 Rs.
<i>Maximum Additional units that can be produced by additional capacity</i>	5,000	1,250	2,250 (No. of units)

B and C need material A as their input. Material A is available outside at Rs.15 per unit. Division A supplies the material free from defects. Each unit of B and C requires one unit of A as the input material.

Advanced Management Accounting

If B purchases from outside, it has to pay Rs.15 per unit. If B purchases from A, it has to incur in addition to the transfer price, Rs.2 per unit as variable cost to modify it.

B has sufficient idle capacity to inspect its inputs without additional costs.

If C gets material from A, it can use it directly, but if it gets material from outside, which is at Rs.15, it has to do one of the following:

(i) Inspect it at its own shop floor at Rs.3 per unit

Or

(ii) Get the supplier to supply inspected products and pay the supplier Rs.2 p. u. as inspection charges.

Or

(iii) A has enough idle labour, which it can lend to C to inspect at Re 1 p.u. even though C purchases from outside.

A has to fix a uniform transfer price for both B and C. The transfer price will not be known to outsiders and is at the discretion of the Divisional Managers.

What is the best strategy for each division and the company as a whole?

Answer

B will not pay A anything more than 13, because at 13, it will incur additional cost of Rs.2/- to modify it, $13 + 2 = 15$, the outside cost.

	A		B	C
	Outside sale	Transfer to B & C		
Divisional variable cost of production	7	7	19	25
Transfer from A			13	13
Modification			2	
Total Variable Cost of production	7	7	34	38
Selling Price	15	13	40	50
Contribution	8	6	6	12

Option for C, Purchase all units from A @ 13: Any other option is costlier.

	A	B	C
Maximum external demand	3,750	5,000	4,000

Transfer Pricing

Existing capacity	5,000	2,500	2,500
Maximum capacity that can be added	5,000	1,250	2,250
Total maximum that can be produced	10,000	3,750	4,750
Additional fixed cost on expansion	24,000	6,000	18,700
Units that must be sold/transfer to get this amount as contribution	$\frac{24,000}{6} = 4,000$	$\frac{6,000}{6} = 1,000$	$\frac{18,700}{6} = 1,558.33$
External demand not covered by existing capacity	-	2,500	1,500
Decision	Expand make 10,000 units 3,750 – outside 3,750 – B 2,500 – C	Expand make 2,500 + 1,250 = 3,750 units	Do not expand make only 2,500 units.

	A		B	C
	Outside sale	Transfer to B & C		
Units	3,750	3,750 + 2,500 = 6,250	3,750	2,500
Contribution / unit	8	6	6	12
Contribution (Rs.)	30,000	37,500	22,500	30,000
	67,500		22,500	30,000
Additional Fixed Cost	24,000		6,000	-
Net revenue addition	43,500		16,500	30,000

Individual strategy is the Company's best strategy.

Question 12

Optically Ltd. makes two kinds of products, P (lenses) and Q (swimming goggles) in divisions P and Q respectively. P is an input for Q and two units of P are needed to make one unit of Q.

Advanced Management Accounting

The following data is given to you for a period :

	<i>P</i> Rs./u of P	<i>Q</i> Rs./u of Q
Direct Materials	20	25 (excluding P)
Direct Labour	30	35
Variable Overhead	10	20
External Demand (units)	3,000	3,000
Capacity (units)	7,000	2,500
Selling Price Rs./u (outside market)	100	410

If Q buys P from outside, it has the following costs:

For order quantity 2,499 or less Rs.90 per unit for the entire quantity ordered.

For order quantity 2,500 – 5,000 Rs.80 per unit for the entire quantity ordered.

For order quantity more than 5,000 Rs.70 per unit for the entire quantity ordered.

You are required to:

- Evaluate the best strategies for Division P and Q.
- Briefly explain the concept of goal congruence.

Answer

Opticals Ltd manufactures P(lenses) and Q (swimming goggles).

Division P has option to supply to Division Q or sell to outside market.

Division Q has option to buy from Division P or purchase from outside market.

However, both divisions have to work within their individual capacity.

Variable Cost for product P in Division P = Rs 60.

Variable cost for product Q in Division Q (excluding 2 Nos P's) = Rs 80.

Division P has better market price of its product P than the market price offered to Q division.

For maximizing profit of the organization : Rs

P division should optimise its profit by selling maximum units to outside market.

Contribution per unit for sale to outside for division P 40

Contribution per unit for Div Q as follows :

Sale price - Variable cost (excluding lenses) 330

Transfer Pricing

Max Contribution per unit (if procured from P div at its variable cost i.e Rs 60)	210
Min Contribution per unit (if procured at Rs 90 per unit from outside)	150
Contribution per unit at transfer price of Rs 70 i.e minimum market price	190

Option 1 : Division Q buys 5001 units from market @ Rs 70 and meets its capacity. Division P sells 3000 units to outside market @ Rs 100

Sale / Transfer	Contrib.	Contribution in		
	/unit	thousand rupees		
	Rs	P Div	Q Div	Total
DivP :Sale of 3000 units to outside market @ Rs 100	40	120		120
DivQ: Sale of 2500 units with P from market @ Rs 70	190		475	475
Less : cost of rejection of one unit of product P			-0.07	-0.07
Total		120	474.93	594.93

Option 2 : Division P sells 3000 units to outside market, transfer 4000 units to div Q and Division Q buys 1000 units from outside market to work within the capacity

P Division agrees to a transfer price so that profitability of Q is not affected. To maintain the same profitability of Q, contribution required from 2000 units for Div Q is Rs 400,000 i.e contribution per unit Rs 200 i.e transfer price per unit of P is Rs 65 per unit to make cost of lences Rs 130

Sale / Transfer	Contrib	Contribution in		
	/unit	thousand rupees		
	Rs	P Div	Q Div	Total
Div P : Sale of 3000 units to outside market	40	120		120
Div P : Transfer of 4000 units to div Q at Rs 65	5	20		20
Div Q :Sale of 2000 units with P from P div @ Rs 65	200		400	400
Div Q : Sale of 500 units with P from market @ Rs 90	150		75	75
Total		140	475	615

Under Option 1, both divisions worked dis-jointly without caring for capacity utilization resulting lower profitability of the organization.

Under Option 2, both divisions worked with mutual advantages for optimizing their individual profits and overall profit for the organization has gone up by effective utilization of capacity.

Product P from Division P fetches higher price from open market indicating good quality of product. Moreover, supply from P division is well assured in the long run which is the justification of establishment of two parallel divisions.

Advanced Management Accounting

Hence, Option 2 is suggested.

- (ii) Division functioning as profit centers strive to achieve maximum divisional profits, either by internal transfers or from outside purchase. This may not match with the organisation's objective of maximum overall profits. Divisions may be commercial to achieve overall objects objectives, where divisional decisions are in line with the overall best for the company, and this is goal congruence. Divisions at a disadvantage may be given due weightage while appraising their performance. Goal incongruence defeats the purpose of divisional profit centre system.

Question 13

A company is organized on decentralized lines, with each manufacturing division operating as a separate profit centre. Each division manager has full authority to decide on sale of division's output to outsiders or to other divisions. Division AB manufactures a single standardized product. Some output is sold externally and remaining is transferred to division XY where it is a subassembly in the manufacture of the division product. The unit cost of division AB product and division XY is as follows:

	Division AB (Rs.)	Division XY (Rs.)
Transfer from division AB to XY	--	42.00
Direct Material	6.00	35.00
Direct Labour	3.00	4.50
Direct expenses	3.00	--
Variable manufacturing overheads	3.00	18.00
Fixed manufacturing overheads	6.00	18.00
Variable selling and packing expenses	3.00	2.50
	24.00	120.00

Division AB sold 40,000 units annually at the standard price of Rs.45 in external market. In additions to the external sales, 10,000 units are transferred annually to division XY at internal price of Rupees 42 per unit. Variable selling and packing expenses are not incurred by supplying division- for the internal transfer of the product. Division XY incorporates the transferred goods into more advance product. The manager of division XY disagrees with the basis used to set the transfer price. He argues that transfer price should be made at variable cost since he claims that his division is taking output that division AB should be unable to sell at price Rs.45.

Transfer Pricing

He also submitted a report of the relationship between selling price and demand to support of his disagreement. The report of customer demand at various selling prices for division AB and for division XY is as follows:

Division AB

Selling price per unit (Rs.)	30	45	60
Demand (Units)	60,000	40,000	20,000

Division XY

Selling price per unit (Rs.)	120	135	150
Demand (Units)	15,000	10,000	5,000

The company has sufficient capacity to meet demand at various selling prices. Internal transfer demanded units will be decided by XY division.

Required:

- (i) To calculate divisional profitability and overall profitability of company if division AB transfers demanded units to XY at price of Rs. 42.
- (ii) To calculate divisional profitability and overall profitability of company if division AB transfers demanded units to XY at variable cost.
- (iii) In place of internal transfers, AB division can sell 10,000 units of their product in new external market without effecting existing market, at price Rs. 32 per unit and XY division can purchase these units at the rate of Rs. 31 in open market. Calculate company's profit by following above strategies.

Answer

(i) AB sells product at external market

Selling price (Rs.)	30	45	60
Less Variable cost	18	18	18
Contribution (per unit)	12	27	42
Demands (units)	60,000	40,000	20,000
Total contribution	7,20,000	10,80,000	8,40,000

Optimal output is 40,000 units at a selling price of Rs.45

AB transfer at Rs.42 to XY division then contribution of XY

Selling price (Rs.)	120	135	150
Less Variable cost V+TP	102	102	102

Advanced Management Accounting

(42+60)			
Contribution (per unit)	18	33	48
Demands (units)	15,000	10,000	5,000
Total contribution	2,70,000	3,30,000	2,40,000

Manager will choose out put level 10,000 units at a selling price of Rs.135.

Overall profit when transfer made at Rs.42

Division AB contribution on 10,000 units $[42 - (18 - 3)]$	= 2,70,000
Division XY contribution 10,000 $(135 - 102)$	= <u>3,30,000</u>
Total contribution	= 6,00,000
Division AB contribution from external market sale	= <u>10,80,000</u>
Total profit	= <u>16,80,000</u>

(ii) AB transfer at variable cost

Selling price (Rs.)	120	135	150
Less Variable cost (15+60)	75	75	75
Contribution (per unit)	45	60	75
Demands (units)	15,000	10,000	5,000
Total contribution	6,75,000	6,00,000	3,75,000

Optimal is 15,000 units at the rate of 120 per unit.

If AB transfer at Variable cost (Rs.15) then no contribution will be generated by AB division

XY division choose 15,000 units level gives contribution $15,000 \times 45$	= 6,75,000
Division AB contribution from external market sale	= <u>10,80,000</u>
Total contribution	= <u>17,55,000</u>

(iii) Contribution AB division by selling 10,000 units to new external market at Rs.32 and XY division purchasing at Rs.31.

Contribution $(32 - 18) \times 10,000$	= 1,40,000
XY contribution $[135 - (31 + 60)]$	= 4,40,000
Division AB contribution from external market sale	= <u>10,80,000</u>
Total contribution	= <u>16,60,000</u>

Question 14

What should be the basis of transfer pricing, if unit variable cost and unit selling price are not constant?

Answer

If unit variable cost and unit selling price were not constant then the main problem that would arise while fixing the transfer price of a product would be as follows:

There is an optimum level of output for a firm as a whole. This is so because there is a certain level of output beyond which its net revenue will not rise. The ideal transfer price under these circumstances will be that which will motivate these managers to produce at this level of output.

Essentially, it means that some division in a business house might have to produce its output at a level less than its full capacity and in all such cases a transfer price may be imposed centrally.

Question 15

- (a) *What will be the marketable transfer pricing procedure regarding the goods transferred under the following conditions (each condition is independent of the other)?*
- (i) *When division are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products.*
 - (ii) *If the external market for the transferred good is not reasonably competitive.*
- (b) *Discuss the potential for maximization of income by a multinational through the use of transfer pricing mechanism.*

Answer

(a) Marketable Transfer Pricing Procedure

- (i) When division are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products, then the most suitable transfer price would be, the market price, as it generally leads to optimal decisions.
- (ii) In case, the external market for the transferred good is not reasonable competitive, following two situations may arise in this case.
 - (a) If there is idle capacity: Under this situation opportunity cost will be zero hence minimum transfer price should be equal to the additional

outlay costs incurred upto the point of transfer (sometimes approximated by variable costs).

- (b) If there is no idle capacity: Under this situation opportunity cost should be added to outlay costs for determining minimum transfer price.
- (b) The potential for maximization of income by a multinational through the use of transfer pricing mechanism is based on the successful implementation of the following steps:
 - (i) Transfer pricing may be set relatively higher for affiliates in relatively high-tax countries that purchase inputs from affiliates located in relatively low-tax countries.
 - (ii) Transfer prices to affiliates in countries which are subject to import duties for goods or services purchase may be set low so as to avoid host country taxes.
 - (iii) Transfer prices to an affiliate in a country that is encountering relatively high inflation may be set relatively high to avoid some of the adverse effects of local currency devaluation that are related to the high inflation.
 - (iv) Transfer prices may be set high for goods and services purchased by an affiliate operating in a country that has imposed restriction on the repatriation of income to foreign companies.
 - (v) Transfer prices may be set low for an affiliate that is trying to establish a competitive advantage over a local company either to break into a market or to establish a higher share of the company's business.

EXERCISE

Question 1

In transfer pricing what is common conflict between a division and the company as a whole.

Answer

Refer Chapter 8: Paragraph: 8.4

Question 2

A Company has two Division, Division 'A' and Division 'B'. Division 'A' has a budget of selling 2,00,000 nos. of a particular component 'x' to fetch a return of 20% on the average assets employed. The following particulars of Division 'A' are also known:

<i>Fixed Overhead</i>	<i>Rs.5 lakhs</i>
<i>Variable Cost</i>	<i>Re.1 per unit</i>
<i>Average Assets</i>	
<i>Sundry Debtors</i>	<i>Rs.2 lakhs</i>
<i>Inventories</i>	<i>Rs.5 lakhs</i>
<i>Plant & Equipments</i>	<i>Rs.5 lakhs</i>

However, there is constraint in Marketing and only 1,50,000 units of the component 'x' be directly sold to the proposed price.

It has been gathered that the balance 50,000 units of component 'x' can be taken up by Division 'B' Division 'A' wants a price of Rs.4 per unit of 'x' but Division 'B' is prepared to pay Rs.2 per unit of 'x'.

Division 'A' has another option in hand, which is to produce only 1,50,000 units of component 'x'. This will reduce the holding of assets by Rs.2 lakhs and fixed overhead by Rs.25,000.

You are required to advise the most profitable course of action for Division 'A'.

Answer

Most Profitable Course of Action: Sale to market and transfer to division B.

Question 3

Enumerate and briefly explain any three methods of determining transfer price.

Answer

Refer Chapter 8: Paragraph: 8.3.1

Advanced Management Accounting

Question 4

A company is organized on decentralized lines, with each manufacturing division operating as a separate profit centre. Each division manager has full authority to decide on sale of the division's output to outsiders and to other divisions.

Division C has always purchased its requirements of a component from Division A. But when informed that Division A was increasing its selling price to Rs.150, the manager of Division C decided to look at outside suppliers.

Division C can buy the component from an outside supplier for Rs.135. But Division A refuses to lower its price in view of its need to maintain its return on the investment.

The top management has the following information:

C's annual purchase of the component	1,000 units
A's variable costs per unit	Rs.120
A's fixed cost per unit	Rs.20

Required:

- Will the company as a whole benefit, if Division C bought the component at Rs.135 from an outside supplier?
- If A did not produce the material for C, it could use the facilities for other activities resulting in a cash operating savings of Rs.18,000. Should C then purchase from outside sources?
- Suppose there is no alternative use of A's facilities and the market price per unit for the component drops by Rs.20. Should C now buy from outside?

Answer

(i)	Net cost (benefit) to the company as a whole	Rs. 15,000
(ii)	Net cost (benefit) to the company as a whole	Rs. (3,000)
(iii)	Net cost (benefit) to the company	Rs. (5,000)

Question 5

Division Z is a profit centre, which produces four products A, B, C and D. Each product is sold in the external market also. Data for the period is as follows:

	A	B	C	D
Market Price per unit	Rs.150	Rs.146	Rs.140	Rs.130
Variable cost of Production per Unit	Rs.130	Rs.100	Rs.90	Rs.85
Labour Hours required per Unit	3	4	2	3

Product D can be transferred to division Y but the maximum quantity that might be required for transfer is 2,500 units of D.

The maximum sales in the external market are:

A	2,800 units
B	2,500 units
C	2,300 units
D	1,600 units

Division Y can purchase the same product at a slightly cheaper price of Rs.125 per unit instead of receiving transfers of product D from division Z.

What should be transfer price for each unit for 2,500 units of D, if the total labour hours available in division Z are:

(i) 20,000 hours?

(ii) 30,000 hours?

Answer (i)

	2,500 units of product D	Per unit of Product D
Transfer price	2,95,850	118.34

(ii)

	2,500 units of product D	Per unit of Product D
Transfer price	2,47,833.20	99.13

Question 6

City Instrument Company (CIC) consists of the Semi-conductor Division and the Mini-computer Division, each of which operates as an independent profit centre. Semi-conductor Division employs craftsmen, who produce two different electronic components, the new – high performance Super chip and an older product called Okay-chip. These two products have the following cost characteristics:

	Super-chip		Okay-chip	
Material	Parts	Rs.20	Parts	Rs.10
Labour	2 hours × Rs.140	280	½ hours × Rs.140	70

Advanced Management Accounting

Annual Overhead in Semi-conductor Division is Rs.40,00,000 all fixed. Owing to high skill level necessary for the craftsmen, the Semi-conductor Divisions capacity is set at 50,000 hours per year.

To date, only one customer has developed a product utilizing super-chip, and this customer orders a maximum of 15,000 super-chips per year at a price of Rs.600 per chip. If CIC cannot meet his entire demand, the customer curtails his own production. The rest of the semi-conductor's capacity is devoted to Okay-chips, for which there is unlimited demand at Rs.120 per chip.

The Mini-computer Division produces only one product, a process control unit, which requires a complex circuit board imported at a price of Rs.600. The control units costs are:

Control Unit		
Material	Circuit board	Rs.600
	Other parts	80
Labour	5 hours @ Rs.100	500

The Mini-computer Division is composed of only a small assembly plant and all overhead is fixed at a total of Rs.8,00,000 per year. The current market price for the control unit is Rs.1,400 per unit.

A joint research project has just revealed that with minor modifications, a single super-ship could be substituted for the circuit board currently used by the Mini-computer Division. The modification would require an extra one-hour of labour by Mini-computer's staff, for a total of 6 hours per control unit. Mini-Computer has therefore asked Semi-conductor division to declare a transfer price at which Semi-conductor division would sell super-chip internally.

Required:

- (i) Mini-computer expects to sell 5,000 control units this year .From the overall view point of CIC, how many super-chips should be transferred to Mini-computer Division to replace circuit boards?
- (ii) If the demand for the control units is sure to be 5,000 units, but its price is uncertain, what should be the transfer price of super-chip to ensure proper decisions? (All other data unchanged)
- (iii) If demand for the control unit rises to 12,000 units at a price of Rs.1,400 per unit, how many of 12,000 units should be built using super-chip? (All other data unchanged.)

Answer

1. Contribution per hour of Super-chips and Okay-chips:

	<i>Super-chips</i>	<i>Okay-chips</i>
Contribution per hour	150	80
2. hours utilized in meeting the demand of 15,000 units of Super-chips and utilizing the remaining hours for Okay-chips out of available hours of 50,000 per annum:
50000 Hours
3. Contribution of a process control unit (using an imported complex circuit board):

Contribution per unit (Rs.) :	220
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4. Contribution of process control unit (using a Super-chips):

Contribution per unit (Rs.) :	420
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Question 7

A Company is organised into two divisions. Division X produces a component, which is used by division Y in making of a final product. The final product is sold for Rs540 each. Division X has capacity to produce 2,500 units and division Y can purchase the entire production. The variable cost of division X in manufacturing each component is Rs256.50.

Division X informed that due to installation of new machines, its depreciation cost had gone up and hence wanted to increase the price of component to be supplied to division Y to Rs297 , however division Y can buy the component from out side the market at Rs270 each. The variable cost of division Y in manufacturing the final product by using the component is Rs202.50 (excluding component cost).

Present the statement indicating the position of each Division and the company as whole taking each of the following situations separately:

- (i) *If there is no alternative use for the production facility of X, will the company benefit, if division Y buys from out side suppliers at Rs270 per component.*
- (ii) *If internal facilities of X are not otherwise idle and the alternative use of the facilities will bring an annual cash saving of Rs50,625 to division X, should division Y purchase the component from outside suppliers ?*
- (iii) *If there is no alternative use for the production facilities of division X and the selling price for the component in the outside market drops by Rs20.25, should division Y purchase from outside supplier?*
- (iv) *What transfer price would be fixed for the component in each of the above circumstances?*

Answer

(i) When component is purchased by division Y from outside

Total contribution Rs. 1,68,750

When component is purchased from division X

Total contribution Rs. 2,02,500

(ii) When there is alternative use of Division X with given cash saving

Company's total contribution Rs. 2,19,375

(iii) When there is no alternative use of Division X & selling price of component reduces in the market

Total contribution Rs. 2,19,375

(iv) Transfer price

- (a) Where there is no alternative use of capacity of division X, then variable cost i.e. Rs256.50 per component will be charged.
- (b) If facilities of division X can be put to alternative use then variable cost Rs256.50+ opportunity cost Rs20.25 =Rs276.75 will be transfer price.
- (c) If market price gets reduced to Rs. 249.75 and there is no alternative use of facilities of Division X the variable cost Rs256.50 per component should be charged.