

Cost Concepts in Decision Making

BASIC CONCEPTS & FORMULAE

Basic Concepts

1. **Relevant cost in decision making process:** Costs which are relevant for a particular business option, which are not historical cost but future costs to be associated with different inputs and activities related a business process. Actual, current or historical costs may be used for estimating the future costs of each alternative. The contribution approach, coupled with the ability to distinguish between relevant and irrelevant costs will prove to be a boon for the managers in arriving at correct conclusions in the challenging area of decision making.
2. **Differential cost, Incremental cost and Incremental revenue:** Differential cost (which may be incremental or decremental cost) is the difference in total cost that will arise from the selection of one alternative instead of another. It involves the estimation of the impact of decision alternatives on costs and revenues. The two basic concepts which go together with this type of cost analysis are *incremental revenue* and *incremental costs*. *Incremental revenue* is the change in the total income resulting from a decision. *Incremental costs* represent a change in the total costs resulting from a decision. Such a change in cost is not necessarily variable in nature.
3. **Opportunity cost concept:** The opportunity cost of the value of opportunity foregone is taken into consideration when alternatives are compared. Opportunity Cost is the value of the next best alternative. In other words, it is the opportunity cost lost by diversion of an input factor from one use to another. It is the measure of the benefit of opportunity foregone.

The opportunity cost is helpful to managers in evaluating the various alternatives available when multiple inputs can be employed for multiple uses. These inputs may nevertheless have a cost and this is measured by the sacrifice made by the alternative action in course of choosing another alternatives.
4. **Sunk costs:** Costs which do not change under given circumstance and do not play any role in decision making process are known as sunk costs. They are historical costs incurred in the past. In other words, these are the costs which have been incurred by a decision made in past and cannot be changed by any decision made in the future.

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5. Application of Incremental/Differential Cost Techniques In Managerial Decisions:

The areas in which the above techniques of cost analysis can be used for making managerial decisions are:

- (i) Whether to process a product further or not.
- (ii) Dropping or adding a product line.
- (iii) Making the best use of the investment made.
- (iv) Acceptance of an additional order from a special customer at lower than existing price.
- (v) Opening of new sales territory and branch.
- (vi) Make or Buy decisions.
- (vii) Submitting tenders
- (viii) Lease or buy decisions
- (ix) Equipment replacement decision.

Question 1

Explain briefly the concepts of Opportunity costs and Relevant costs.

Answer

Opportunity cost is a measure of the benefit of opportunity forgone when various alternatives are considered. In other words, it is the cost of sacrifice made by alternative action chosen. For example, opportunity cost of funds invested in business is the interest that could have been earned by investing the funds in bank deposit.

Relevant Cost: Expected future costs which differ for alternative course. It is not essential that all variable costs are relevant and all fixed costs are irrelevant. Fixed, or variable costs that differ for various alternatives are relevant costs. Relevant costs draw our attention to those elements of cost which are relevant for the decision.

E.g. Direct labour under alternative I – ₹ 10/ hour

Direct labour under alternative II – ₹ 20/hour

Then, direct labour is relevant cost.

Question 2

X is a multiple product manufacturer. One product line consists of motors and the company produces three different models. X is currently considering a proposal from a supplier who wants to sell the company blades for the motors line.

The company currently produces all the blades it requires. In order to meet customer's needs, X currently produces three different blades for each motor model (nine different blades).

The supplier would charge ₹ 25 per blade, regardless of blade type. For the next year X has projected the costs of its own blade production as follows (based on projected volume of 10,000 units):

Direct materials	₹ 75,000
Direct labour	₹ 65,000
Variable overhead	₹ 55,000
Fixed overhead:	
Factory supervision	₹ 35,000
Other fixed cost	<u>₹ 65,000</u>
Total production costs	<u>₹ 2,95,000</u>

Assume (1) the equipment utilized to produce the blades has no alternative use and no market value, (2) the space occupied by blade production will remain idle if the company purchases rather than makes the blades, and (3) factory supervision costs reflect the salary of a production supervisor who would be dismissed from the firm if blade production ceased.

- (i) *Determine the net profit or loss of purchasing (rather than manufacturing), the blades required for motor production in the next year.*
- (ii) *Determine the level of motor production where X would be indifferent between buying and producing the blades. If the future volume level were predicted to decrease, would that influence the decision?*
- (iii) *For this part only, assume that the space presently occupied by blade production could be leased to another firm for ₹ 45,000 per year. How would this affect the make or buy decision?*

Answer

- (a) This is a make or buy decision so compare the incremental cost to make with the incremental cost buy.

Incremental Costs Per Unit	Make the Blades
Direct materials (₹75,000 ÷ 10,000 units)	₹ 7.50
Direct labour (₹ 65,000 ÷ 10,000 units)	₹ 6.50
Variable overhead (₹ 55,000 ÷ 10,000)	₹ 5.50

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Supervision (₹ 35,000 ÷ 10,000)	₹ 3.50
Total cost	₹ 23.00

Compare the cost to make the blades for 10,000 motors. ₹ 23.00, with the cost to buy, ₹ 25.00. There is a net loss of ₹ 2.00 if 'X' chooses to buy the blades.

- (b) 'X' will be indifferent between buying and making the blades when the total costs for making and buying will be equal at the volume level where the variable costs per unit times the volume plus the fixed avoidable costs are equal to the supplier's offered cost of ₹ 25.00 per unit times the volume.

(Direct materials + Direct labour + Variable overhead) × Volume + Supervision = Cost to buy × Volume.

Let volume in units = x

$$(7.50 + 6.50 + 5.50) \times x + 35,000 = 25.00x$$

$$19.50x + 35,000 = 25.00x$$

$$35,000 = 25.00 \times x - 19.50 \times x$$

$$35,000 = 5.50 \times x$$

$$x = 6,364 \text{ units of blades}$$

As volume of production decreases, the average per unit cost of in house production increases. If the volume falls below 6,364 motors, then 'X' would prefer to buy the blades from the supplier.

- (c) If the space presently occupied by blade production could be leased to another firm for ₹ 45,000 per year, 'X' would face an opportunity cost associated with in house blade production for the 10,000 units of ₹ 4.50 per unit.

$$\text{New cost to make} = 23.00 + 4.50 = 27.50$$

Now 'X' should buy because the cost to make, 27.50, is higher than the cost to buy, 25.00.

Question 3

Why is meant by incremental Revenue?

Answer

Incremental Revenue: Incremental revenue is the additional revenue that arise from the production or sale of a group of additional units. It is one of the two basic concepts the other being incremental cost which go together with differential cost analysis. Incremental cost in fact is the added cost due to change either in the level of activity or in the nature of activity.

Question 4

Distinguish between "Marginal cost" and 'Differential Cost'.

Answer

Marginal cost represents the increase or decrease in total cost which occurs with a small change in output say, a unit of output. In Cost Accounting variable costs represent marginal cost.

Differential cost is the change (increase or decrease) in the total cost (variable as well as fixed) due to change in the level of activity, technology or production process or method of production.

In other words, it can be defined as the cost of one unit of product or service which would be avoided if that unit was not produced or provided.

The main point which distinguishes marginal cost and differential as that change in fixed cost when volume of production increases or decreases by a unit of production. In the case of differential cost variable as well as fixed cost. i.e. both costs change due to change in the level of activity, whereas under marginal costing only variable cost changes due to change in the level of activity.

Question 5

What are the applications of incremental cost techniques in making managerial decisions?

Answer

Incremental cost technique: It is a technique used in the preparation of ad-hoc information in which only cost and income differences between alternative courses of action are taken into consideration. This technique is applicable to situations where fixed costs alter.

The essential pre-requisite for making managerial decisions by using incremental cost technique, is to compare the incremental costs with incremental revenues. So long as the incremental revenue is greater than incremental costs, the decision should be in favour of the proposal.

Applications of incremental cost techniques in making managerial decisions

The important areas in which incremental cost analysis could be used for managerial decision making are as under:

- (i) Introduction of a new product
- (ii) Discontinuing a product, suspending or closing down a segment of the business
- (iii) Whether to process a product further or not

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- (iv) Acceptance of an additional order from a special customer at lower than existing price
- (v) Opening of new sales territory and branch.
- (vi) Optimizing investment plan out of multiple alternatives.
- (vii) Make or buy decisions
- (viii) Submitting tenders
- (ix) Lease or buy decisions
- (x) Equipment replacement decisions

Question 6

Ranka Builders has been offered a contract by Excel Ltd. to build for it five special Guest Houses for use by top management. Each Guest House will be an independent one. The contract will be for a period of one year and the offer price is ₹ One crore. In addition Excel Ltd. will also provide 2 grounds of land free of cost for the purpose of construction. The Chief Accountant of Ranka Builders has prepared an estimate on the basis of which he has advised that the contract should not be accepted at the price offered. His estimate was as follows:

	₹ in Lacs
Land (3 Grounds at ₹ 20 lacs each)	60
Drawings and design	7
Registration	10
Materials:	
Cement and Sand	6
Bricks and Tiles	4
Steel	10
Others (including interior decoration)	10
Labour – Skilled	12
- Unskilled	8
- Supervisor's Salary	5
Overheads General	12
Depreciation	<u>6</u>
Total Cost	<u>150</u>

The Accountant also provides the following information:

Land: The total requirement of land is 3 grounds costing ₹ 20 lacs per ground Excel Ltd. will provide 2 grounds free of cost.

Drawing and Design: These have already been prepared and 50% of the cost has already been incurred.

Materials:

- (i) Cement and sand are already in stock and are in regular use. If used for this contract, they have to be replaced at a cost of ₹ 8 lacs.*
- (ii) Bricks and tiles represent purchases made several months before for a different contract, they have to be sold readily for a net ₹ 5 lacs after meeting all further expensed.*
- (iii) Others: Material worth ₹ 2 lacs relating to interior decoration are in stock for which no alternative use is expected in the near future. However they can be sold for ₹ 1 lac.*

Labour:

- (i) Skilled workers will be transferred to this project from another project. The Project Manager claimed that if the men were returned to him, he could have earned the company an additional ₹ 2 lacs in terms of profits.*
- (ii) The supervisor undertakes various tasks in the sites and his pay and continuity of employment will not be affected by the new contract if the contract is taken, he will devote half of his time.*

Overheads:

- (i) The equipment that would be used on the contract was bought one year before for ₹ 30 lacs and is expected to last for five years. It can also be used on other contracts and the current replacement price will be ₹ 32 lacs and in a year's time it will be ₹ 25 lacs.*
- (ii) The general overheads includes both specific and absorbed overheads. If the contract is not undertaken, ₹ 4 lacs of the same can be avoided.*

Ranka Builders has also on hand another project, which would not be executed if the contract from Excel Ltd. were to be accepted. The estimated profit on that project is ₹ 10 lacs.

In the light of information given above, you are required to indicate with reasons whether the contract from Excel Ltd. should be accepted or not.

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Answer

M/s Ranka Builder's
Statement of relevant costs on the
Acceptance of contract form Excel Ltd.

(Figure in ₹ lakh)

S. No.	Particulars	Basis for the cost to be relevant	Relevant cost if contract is accepted ₹	Irrelevant cost if the contract is accepted ₹
1.	Land cost (Refer to working note 1)		20	
2.	Drawings and design		-	7 (Sunk cost)
3.	Registration	Incremental	10	-
4.	Materials:			
	Cement and sand	Replacement	8	
	Bricks and Tiles	Opportunity	5	
	Steel	Incremental	10	
	Others (Refer to working note 2)		9	
5.	Labour:			
	Skilled	Opportunity	2	
	Unskilled	Incremental	8	
	Supervisor's Salary			5 (Sunk Cost)
6.	Overheads:			
	General	Relevant (avoidable)	4	
	Depreciation		-	6 (Sunk Cost)
	Replacement cost of machine		7	
7.	Estimated profit foregone on other project	Opportunity foregone	10	
	Total		93	

Decision: Since the offer price of contract is ₹ 1 crore and its total relevant cost is ₹ 93 lacs; these figures clearly shows that the offer should be accepted.

Working notes:

- | | | ₹ (Lacs) |
|----|--|----------|
| 1. | Total cost of 3 grounds of land | 60 |
| | Cost of ground of land will be borne by Excel Ltd. | 40 |
| | Cost of 1 ground of land will be borne by M/s Ranka Builders | 20 |
| 2. | Others material cost is ₹ 10 lacs, it includes material worth ₹ 2 lacs, relating to interior decoration, which is a sunk cost, this material can be sold for ₹ 1 lac, (which is a relevant opportunity cost) and ₹ 8 lacs, material is an incremental cost. Hence total relevant cost of others material is ₹ 9 lacs. (₹ 8 lacs, incremental + ₹ 1 lac, opportunity cost). | |
| 3. | Since the equipment can also be used on this contract. Its current replacement price is ₹ 32 lacs, and after one year its cost will be ₹ 25 lacs. Therefore the relevant opportunity cost of machine is: (₹ 32 lacs – ₹ 25 lacs). | |

Question 7

AB Ltd. manufactures product 'X'. the company operates single shift of 8 hours for 300 days in a year. The capital employed in the business is ₹18 crores.

The manufacturing operations of the company comprise of four production departments. The company at present produces 9,000 units of product 'X' at maximum capacity. However, the capacity utilization of all the four departments are not equal and the present individual capacity utilizations are as under:

Department	Capacity Utilisation (%)
A	75
B	100
C	70
D	50

The present return on capital of the company has gone down to 10% from the earlier cut-off rate of 15% due to increased cost of production.

As the company cannot operate more than one shift, the management is considering two alternative proposals to increase the return on capital employed.

Alternative I

To hire out the surplus capacity of departments A, C and D. The cost and revenue projections are as under:

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Department	Hire Charges per Hour	Incremental Cost per Hour
A	2,500	2,000
C	1,800	1,500
D	1,600	1,200

Alternative II

To increase the installed capacity of the factory to 12,000 units by adding plant and machinery in department B at a capita cost of ₹ 4 crore. Any Balance surplus capacity in other departments after meeting the increased volume to be hired out as per alternative I. The additional units would fetch incremental revenue of ₹ 1,600 per unit.

You are required to evaluate the two proposals and suggest to the management, which of the two proposals is to be accepted.

Answer

Working notes:

- Statement of total available, utilized and surplus capacity hours when 9,000 units of product 'X' are produced.

Departments	Available Capacity hours	Capacity utilized		Surplus Capacity hours
		(in %)	(in hours)	
(1)	(2)	(3)	(4) = (2)×(3)	(5)=(2)-(4)
A	2,400 (300 days × 8 hours)	75	1,800	600
B	2,400	100	2,400	NIL
C	2,400	70	1,680	720
D	2,400	50	1,200	1,200

- Statement of total available, utilized and surplus capacity hours when 12,000 units of product 'X' are produced.

Production Department	Available capacity hours	Capacity utilization on 9,000 units Hours		Balance capacity hours	Unit per hour	Hours required for 3,000 additional units	Surplus capacity hours
		(in %)	in hours				
(1)	(2)	(3)	(4)=(2)×	(5) = (2)	(6)	(7)	(8)=(5)-

			(3)	-(4)			(7)
A	2,400	75	1,800	600	5 $\frac{12,000 \text{ units}}{2,400 \text{ hrs.}}$	600	Nil
B	2,400	100	2,400	Nil	3.75 $\frac{14,000 \text{ units}}{2,400 \text{ hrs.}}$	800	Nil
C	2,400	70	1,680	720	5.36 $\frac{14,000 \text{ units}}{2,600 \text{ hrs.}}$	560	160
D	2,400	50	1,200	1,200	7.5 $\frac{18,000 \text{ units}}{2,400 \text{ hrs.}}$	400	800

Alternative I

Statement of net Revenue (Under Alternative I)

Production	Surplus capacity hours (Refer to W.N.-1)	Hire charges per hour	Total revenue in (₹ Lacs)	Incremental costs per hour ₹	Total cost in (₹ Lacs)	Net revenue in (₹)
	(a)	(b)	(c)=(a)×(b)	(d)	(e)=(a)×(d)	(f)=(c)-(e)
A	600	2,500	15.00	2,000	12.00	3.00
B	720	1,800	12.96	1,500	10.80	2.16
D	1,200	1,600	19.20	1,200	14.40	4.90
Total			47.16		37.20	9.96

Add: present income (10% of ₹ 1,800 lacs) 180.00

Total return 189.96

Return on investment

$$= \frac{\text{Total return}}{\text{Total investment}} \times 100 = \frac{189.96}{1,800} \times 100 = 10.553\%$$

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Alternative II

Statement of Net Revenue when 12,000 units of product 'X' are produced and surplus plant capacity (hours) in departments C and D hired out.

Production	Surplus capacity hours (Refer to W.N.-2)	Hire charges per hour	Total revenue in (₹ Lacs)	Incremental costs per hour ₹	Total cost in (₹ Lacs)	Net revenue in (₹ Lacs)
	(1)	(2)	(3)=(1)×(2)	(4)	(5)=(1)×(4)	(6)=(3)-(5)
C	160	1,800	2.88	1,500	2.40	0.48
D	800	1,600	12.80	1,200	9.60	3.20
Total			15.68		12.00	3.68

Add: Revenue (in lacs) earned on 3,000 additional units sale (3,000 units is × ₹1,600) 48.00

Add: Present income on investment (10% × ₹ 1,800 lacs) 180.00

Total Return (in lacs) 231.69

Return on investment = $\frac{231.68 \text{ lacs}}{2,200 \text{ lacs}} \times 100 = 10.53\%$

Evaluation of two alternative proposals:

Since the return on investment under alternative I is more than that under alternative II; therefore it should be accepted.

Question 8

B Ltd. is a company that has, in stock, materials of type XY that cost ₹ 75,000, but that are now obsolete and have a scrap value of only ₹ 21,000. Other than selling the material for scrap, there are only two alternative uses for them.

Alternative 1 – Converting the obsolete materials into a specialized product, which would require the following additional work and materials:

Material A	600 units
Material B	1,000 units
Direct Labour	
5,000 hours unskilled	
5,000 hours semi skilled	

5,000 hours highly skilled	
Extra selling and delivery expenses	₹ 27,000
Extra advertising	₹ 18,000

The conversion would produce 900 units of saleable product and these could be sold for ₹ 300 per unit.

Material A is already in stock and is widely used within the firm. Although present stocks together with orders already planned, will be sufficient to facilitate normal activity and extra material used by adopting this alternative will necessitate such materials being replaced immediately. Material B is also in stock, stock, but is unlikely that any additional supplies can be obtained for some considerable time, because of an industrial dispute. At the present time material B is normally used in the production of product Z, which sells at ₹ 390 per unit and incurs total variable cost (excluding Material B) of ₹ 210 per unit. Each unit of product Z uses four units of Material B. The details of Materials A and B are as follows:

	Material A (₹)	Material B (₹)
Acquisition cost at the time of purchase	100 per unit	₹ 10 per unit
Net realizable value	85 per unit	₹ 18 per unit
Replacement cost	90 per unit	-

Alternative 2 – Adopting the obsolete materials for use as a substitute for a sub-assembly that is regularly used within the firm. Details of the extra work and materials required are as follows:

Material C	1,000 units
Direct Labour:	
4,000 hours unskilled	
1,000 hours semi-skilled	
4,000 hours highly skilled	

1,200 units of the sub-assembly are regularly used per quarter at a cost of ₹ 900 per unit. The adaptation of material XY would reduce the quantity of the sub-assembly purchased from outside the firm to 900 units for the next quarter only. However, since the volume purchased would be reduced, some discount would be lost and the price of those purchased from outside would increase to ₹ 1,050 per unit for that quarter.

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Material C is not available externally though 1,000 units required would be available from stocks, it would be produced as extra production. The standard cost per unit of Material C would be as follows:

	₹
Direct labour, 6 hour unskilled labour	18
Raw materials	13
Variable overhead: 6 hours at ₹1 06	
Fixed overhead: 6 hours at ₹3	18
	55

The wage rate and overhead recover rates for B Ltd. are:

Variable overhead	₹ 1 per direct labour hour
Fixed overhead	₹ 2 per direct labour hour
Unskilled labour	₹ 3 per direct labour hour
Semi-skilled labour	₹ 4 per direct labour hour
Highly skilled labour	₹ 5 per direct labour hour

The unskilled labour is employed on a casual basis and sufficient labour can be acquired to exactly meet the production requirements. Semi-skilled labour is part of the permanent labour force, but the company has temporary excess supply of this type of labour at the present time. Highly skilled labour is in short supply and cannot be increased significantly in the short-term, this labour is presently engaged in meeting the demand for product L, which requires 4 hours of highly skilled labour. The contribution from the sale of one unit of product L is ₹ 24.

Given the above information, you are required to present cost information advising whether the stocks of Material XY should be sold, converted into a specialized product (Alternative 1) or adopted for use as a substitute for a sub-assembly (Alternative 2).

Answer

Alternative 1 – (Conversion versus immediate sale)

	₹	₹	₹
Sales revenue 900 units at ₹ 300 per unit (Refer to working note 1)			2,70,000
Less: Relevant costs			
Material XY opportunity cost (Refer to working note 2)		21,000	
Material A – units @ ₹ 90 per unit (Refer to working note		54,000	

3			
Material B – 1,000 units @ ₹ 45 per unit (Refer to working note 4)		45,000	
Direct Labour:			
Unskilled – 5,000 hours @ ₹ 3 per hour	15,000		
Semi-skilled	Nil		
Highly skilled – 5,000 hours @ ₹ 11 (Refer to working note 5)	<u>55,000</u>	70,000	
Variable overheads 15,000 hours @ ₹ 1 (Refer to working note 6)		15,000	
Extra selling and delivery expenses	27,000		
Extra advertising	<u>18,000</u>	<u>45,000</u>	<u>2,50,000</u>
Fixed advertising		Nil	
(To remain same, not relevant)			–
Excess of relevant revenues			<u>20,000</u>
Alternative 2 – (Adaptation versus Immediate Sale)			
Saving on purchase of sub-assembly			
Normal spending – 1,200 units @ ₹ 900 per unit		10,80,000	
Less: Revised spending – 900 units @ ₹ 1,050 per unit (Refer to working note 7)		9,45,000	1,35,000
Less: Relevant costs:			
Material XY opportunity cost (Refer to working note 2)		21,000	
Material C – 1,000 units @ ₹ 37 (Refer to working note 8)		37,000	
Direct labour			
Unskilled – 4,000 hours @ ₹ 3 per hour	12,000		
Semi-skilled	Nil		
Highly skilled – 4,000 hours @ ₹ 11 per hour (Refer to working note 5, 6)	<u>44,000</u>	56,000	
Variable Overheads – 9,000 hours @ ₹ 1/- per hour (Refer to working note 6)		<u>9,000</u>	1,23,000
Fixed overheads	Nil		–
Net relevant savings			<u>12,000</u>

Evaluation:

The evaluation of two alternatives clearly shows that Alternative 1, yields higher net revenue of ₹ 8,000 (₹ 20,000 – ₹ 12,000). Hence because of higher net revenue of Alternative 1, it is advisable to convert material XY into a specialized product.

Working notes:

1. There will be a additional sales revenue of ₹ 2,70,000 if Alternative 1 is chosen.
2. Acceptance of either Alternative 1 or 2 will mean a loss of revenue of ₹ 21,000 from the sale of the obsolete material XY and hence it is an opportunity cost for both of the alternatives. The original purchase cost of ₹ 75,000 is a sunk cost and thus not relevant.
3. Acceptance of Alternative 1 will mean that material A must be replaced at an additional cost of ₹.54,000.
4. Acceptance of Alternative 1 will mean diversion of material B from the production of product Z. The excess of relevant revenues over relevant cost for product Z is ₹ 180 (₹ 390 – ₹ 210) and each unit of product Z uses four units of material B. The lost contribution (excluding the cost of material B which is incurred for both alternatives) will therefore be ₹ 45 for each unit of material B that is used for converting the obsolete materials into a specialised product.
5. Unskilled labour can be matched exactly to the company's production requirements. Hence acceptance of either alternative 1 or 2 will cause the company to incur additional unskilled labour cost at ₹ 3 for each hours. It is assumed that the semi-skilled labour will be able to meet the extra requirements of either alternatives at no extra cost to the company. Hence, cost of semi-skilled labour will not be relevant. Skilled labour is in short supply and can only be obtained by reducing the production of product L, resulting in a loss of contribution of ₹ 24 (given) or ₹ 6 per hour of skilled labour. Hence the relevant labour cost will be ₹ 6 (contribution lost per hour) + ₹ 5 (hourly rate of skilled labour) i.e. ₹ 11 per hour.
6. It is assumed that for each direct labour of input, variable overhead will increase by ₹ 1 hence for each alternative using additional direct labour hours, variable overheads will increase.
7. The cost of purchasing the sub-assembly will be reduced by ₹ 1,35,000 if the second alternative is chosen and so these savings are relevant to the decision.
8. The company will incur additional variable costs, of ₹ 37 for each unit of material C that is manufactured, so the fixed overheads for material C viz. ₹ 18/- per unit is not a relevant cost.

Question 9

Comment on the use of opportunity cost for the purpose of decision-making

Answer

Decision making: Opportunity costs apply to the use of scarce resources, where resources are not secure, there is no sacrifice from the use of these resources.

Where a course of action requires the use of scarce resources, it is necessary to incorporate the lost profit which will be foregone from using scarce resources.

If resources have no alternative use only the additional cash flow resulting from the course of action should be included in decision making as relevant cost.

Question 10

Explain with one example each that sunk cost is irrelevant in making decisions, but irrelevant costs are not sunk costs.

Answer

Sunk cost is a historical cost incurred in the past. In other words it is a cost of a resource already acquired. Future decisions in respect of this resource will not be affected by it. For example, book value of machinery. Hence sunk costs are irrelevant in decision making.

Irrelevant costs are not necessary sunk costs. For example, when a comparison of two alternative production methods using the same material quantity is made, then direct material cost is not affected by the decision but this material cost is not sunk cost.

Question 11

The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

	A Manual (₹)	B Semi Automatic (₹)	C Fully Automatic (₹)
<i>Monthly fixed costs</i>			
Occupancy	15,000	15,000	15,000
Maintenance contract	0	5,000	10,000
Equipment lease	0	25,000	1,00,000
	<u>15,000</u>	<u>45,000</u>	<u>1,25,000</u>
<i>Unit variable costs (per report):</i>			
Supplies	40	80	20

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Labour	(5 hrs × ₹ 40)	(1 hr × ₹ 60)	(0.25 hr × ₹ 80)
	<u>200</u>	<u>60</u>	<u>20</u>
	<u>240</u>	<u>140</u>	<u>40</u>

Required:

- Calculate cost indifference points. Interpret your results.
- If the present case load is 600 cases and it is expected to go up to 850 cases in near future, which method is most appropriate on cost considerations

Answer

- Statement of cost indifference points between ways of processing the clerical work for cases.

	A and B	A and C	B and C
	(₹)	(₹)	(₹)
Differential fixed costs: (I)	30,000	1,10,000	80,000
	(₹ 45,000 – ₹ 15,000)	(₹ 1,25,000 – ₹ 15,000)	(₹ 1,25,000 – ₹ 45,000)
Differential variable costs per case: (II)	100	200	100
	(₹ 240 – ₹ 140)	(₹ 240 – ₹ 40)	(₹ 140 – ₹ 40)
Cost indifference point (I/II)	300	550	800
(Differential fixed costs / Differential variable costs per case)	Cases	Cases	Cases

Interpretation of results:

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

Thus, if expected number of cases is below 300, alternative A should be used. If expected number of cases are between 301 and 800 use alternative B. If expected number of cases is above 800, use alternative C.

- Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go up to 850 cases, alternative C is most appropriate.

Question 12

"Sunk cost is irrelevant in decision-making, but irrelevant costs are not sunk costs". Explain with example.

Answer

Sunk costs are costs that have been created by a decision made in the past and that cannot be changed by any decision that will be made in the future. For example, the written down value of assets previously purchased are sunk costs. Sunk costs are not relevant for decision making because they are past costs.

But not all irrelevant costs are sunk costs. For example, a comparison of two alternative production methods may result in identical direct material costs for both the alternatives. In this case, the direct material cost will remain the same whichever alternative is chosen. In this situation, though direct material cost is the future cost to be incurred in accordance with the production, it is irrelevant, but, it is not a sunk cost.

Question 13

Explain the concept of relevancy of cost by citing three examples each of relevant costs and non-relevant costs.

Answer

Relevant costs are those costs which are pertinent to a decision. In other words, these are the costs which are influenced by a decision. Those costs which are not affected by the decision are not relevant costs.

Examples of relevant costs are:

- (1) All variable costs are relevant costs.
- (2) Fixed Costs which vary with the decision are relevant costs.
- (3) Incremental costs are relevant costs.

Examples of non-relevant costs:

- (1) All fixed costs are generally non-relevant.
- (2) Variable costs which do not vary with the decision are not relevant costs.
- (3) Book value of the asset is not relevant.

Question 14

Explain briefly the concepts of Opportunity costs and Relevant costs.

2.20 Advanced Management Accounting

Answer

Opportunity cost is a measure of the benefit of opportunity forgone when various alternatives are considered. It is the cost of sacrifice made by alternative action chosen.

E.g. opportunity cost of funds invested in business is the interest that could have been earned by investing the funds in bank deposit.

Relevant Cost:

Expected future costs which differ for alternative course. It is not essential that all variable costs are relevant and all fixed costs are irrelevant. Fixed, or variable costs that differ for various alternatives are relevant costs. Relevant costs draw our attention to those elements of cost which are relevant for the decision.

E.g. Direct labour under alternative I – ₹ 10/ hour

Direct labour under alternative II – ₹ 20/hour

Then, direct labour is relevant cost.

Question 15

What are the applications of incremental/differential costs?

Answer

Applications of Incremental/Differential Cost:

1. Whether to process a product further or not.
2. Dropping or adding a product line.
3. Optimizing investment plan.
4. accepting an additional order from a special customer at lower than existing price.
5. Make or buy decision.
6. Opening a new sales territory or branch.
7. Optimizing investment plan out of multiple alternatives.
8. Submitting tenders.
9. Lease or buy decisions.
10. Equipment replacement decisions.

Question 16

Pick out from each of the following items, costs that can be classified under 'committed fixed costs' or 'discretionary fixed costs'.

- (i) Annual increase of salary and wages of administrative staff by 5% as per agreement

- (ii) New advertisement for existing products is recommended by the Marketing Department for achieving sales quantities that were budgeted for at the beginning of the year.
- (iii) Rents paid for the factory premises for the past 6 months and the rents payable for the next six months. Production is going on in the factory.
- (iv) Research costs on a product that has reached 'maturity' phase in its life cycle and the research costs which may be needed on introducing a cheaper substitute into the market for facing competition.
- (v) Legal consultancy fees payable for patent rights on a new product. Patenting rights have been applied for.

Answer

Committed Fixed Cost	Discretionary Fixed Cost
(i) Salary and wage increase	(ii) New Advertisement Cost
(iii) Rents payable for the next 6 months	(iv) Research cost for substitutes
(v) Legal fees for filing for patent rights.	

Question 17

XYZ Ltd. has two divisions, A and B. Division A makes and sells product A, which can be sold outside as well as be used by B. A has a limitation on production capacity, that only 1,200 units can pass through its machining operations in one month. On an average, about 10% of the units that A produces are defective. It may be assumed that out of each lot that A supplies, 10% are defectives.

When A sells in the outside market, the defectives are not returned, since the transportation costs make it uneconomical for the customer. Instead, A's customers sell the defectives in the outside market at a discount.

But, when B buys product A, it has to fix it into its product, which is reputed for its quality. Therefore, B returns all the defective units to A. A can manually rework the defectives, incurring only variable labour cost and sell them outside at ₹ 150 and not having to incur any selling costs on reworked units. If A chooses not to rework, it can only scrap the material at ₹ 30 per unit. B can buy product A from outside at ₹ 200 per unit, but has to incur ₹ 10 per unit as variable transport cost. B can insist to its outside suppliers also that it will accept only good units.

A incurs a variable selling overhead only on units (other than reworked units) sold outside. The following figures are given for the month:

Variable cost of production – Dept. A (₹/unit)	120
Variable selling overhead (₹/u)	20
Selling price per unit in the outside market (₹/u)	200

2.22 Advanced Management Accounting

Current selling price to B (₹/u)	190
Additional variable labour cost of reworking defectives (₹/u)	100
Selling price of reworked defectives (₹/u)	150
Fixed costs for the month (₹)	36,000
Maximum demand from B at present (no. of units)	630

The outside demand can be freely had upto 900 units.

Given the demand and supply conditions, you are required to present appropriate calculations for the following:

- (i) Evaluation of the best strategy for A in the present condition.
- (ii) If B can buy only upto 540 units and the outside demand is only 600 units, how much should A charge B to maintain the same level of profit as in (i) above?

Answer

- (i) Contribution per unit against sale to outside = ₹ (200-120-20) = ₹ 60

In case of transfer, good units and rejected units are in proportion of 9:1

In case of transfer, contribution per good unit = ₹ (190 – 120) = ₹ 70

In case of transfer, contribution per rejected unit = ₹ (150 – 120-100) = ₹ -70

Thus, effective contribution per unit of transfer = ₹ (70 x 0.9 – 70 x 0.1) = ₹ 56

As contribution per unit against outside sale is higher, the best strategy should be to sell maximum number of unit to outside market.

Contribution from outside market from sale of 900 units = ₹ 54,000

₹ (900 x 60)

Contribution from transfer of 300 units to B = ₹ 16,800

₹ (300 x 56)

Total Contribution from best strategy = ₹ 70,800

- (ii) If B's demand is 540 unit, total production required = 600 units.

(540 / 0.9)

Taking outside market demand of 600, it is within production capacity of 1200 units.

Now contribution from 600 units of outside sale = ₹ 36,000

₹ (600 x 60)

Contribution from rejected 60 units = ₹ (4,200)

₹ (60 x – 70)

= ₹ 31,800

To keep same level of contribution as in (i), the contribution required from transfer of 540 unit to B = ₹ 39,000

(₹ 70,800 – 31,800)

Thus, contribution required per unit = ₹ 72.22

₹ 39,000 /540

Hence price to be charged per unit against transfer to B = ₹ 192.2

₹ (120 + 72.22)

Alternative Solution:

Let x be the number of units sold outside and y be the number of units sold to B, before B returns 10% as defectives.

Then, $x + y = 1,200$, is the limitation on production capacity of A.

	Department A	
	Outside ₹	to B ₹
Selling Prices	200	190
Variable Cost – Production	120	120
Variable Cost – Sale	20	--
Total Variable Cost	140	120
Contribution	60	70

Contribution on x units sold outside = $60x$

Out of y units to B, $10\% = \frac{1}{10}y = .1y$ is returned to A. If A scraps, amount got = 30 per unit.

If A reworks and sells, it gets $150 - 100 = 50$ / unit.

\ Decision to reworks all defectives. i.e. $(.1) (y)$

Contribution on good units of B = $0.9y \times 70 = 63y$

Contribution on reworked units of B = $(.1) (y) \times 50 = 5y$

Amount of material lost on manufacture of defectives to B = $12y$

$(.1) (y) \times 120$

\ Contribution on y gross units transferred to B = $56y$

$63y + 5y - 12y$

Total contribution earned by A = $60x + 56y$

where $x + y = 1200$

To maximize contribution, maximize units sold outside.

2.24 Advanced Management Accounting

\ 900 units – sell outside.

Balance $\frac{300}{1200}$ units (gross transfer to B, of which B gives back 30 defectives)

Contribution : ₹ 60 (900) + ₹ 56 (300)
 = ₹ 54,000 + ₹ 16,800

Contribution = ₹ 70,800

Fixed Cost = ₹ 36,000

(i) Profit = ₹ 34,800

(ii) Outside demand = 600 units

Contribution = 600 × ₹ 60 = ₹ 36,000

Balance to be got = ₹ 34,800

 = ₹ 70,800

Out of ₹ 34,800, defectives of B will give

₹ 3,000 (60 × 50)

₹ 31,800 charge to B for 540 units

Contribution to be obtained from 540 units of B = ₹ 31,800

Add: Production cost of 600 units @ 120/- = ₹ 72,000

Amount charged for 540 units = ₹ 1,03,800

\ Price to be charged to B = $\frac{1,03,800}{540} = 192.22$

Per good unit transferred, to maintain the same level of profit as in (a).

Question 18

PQ Ltd. makes and sells a labour-intensive product. Its labour force has a learning rate of 80%, applicable only to direct labour and not to variable overhead.

The cost per unit of the first product is as follows:

Direct materials	10,000
Direct labour	8,000 (@ ₹ 4 per hour)
Variable overhead	<u>2,000</u>
Total variable cost	<u>20,000</u>

PQ Ltd. has received an order from X Ltd. for 4 units of the product. Another customer, Y Ltd. is also interested in purchasing 4 units of the product. PQ Ltd. has the capacity to fulfill both

the orders Y Ltd. presently purchases this product in the market for ₹ 17,200 and is willing to pay this price per unit of PQ's product. But X Ltd. lets PQ choose one of the following options:

(i) A price of ₹ 16,500 per unit for the 4 units it proposes to take from PQ.

Or

(ii) Supply X Ltd.'s idle labour force to PQ, for only 4 units of production, with PQ having to pay only ₹ 1 per labour hour to X Ltd.'s workers. X Ltd.'s workers will be withdrawn after the first 4 units are produced. In this case, PQ need not use its labour for producing X Ltd.'s requirement. X Ltd. assures PQ that its labour force also has a learning rate of 80%. In this option, X Ltd. offers to buy the product from PQ at only ₹ 14,000 per unit.

X and Y shall not know of each other's offer.

If both orders came before any work started, what is the best option that PQ may choose?

Present suitable calculations in favour of your argument.

Answer

Units	Average hours per unit	
1	2,000	
2	1,600	(2,000 × 80%)
4	1,280	(1,600 × 80%)
8	1,024	(1,280 × 80%)

Material Cost / unit	= ₹ 10,000
Variable cost	= ₹ <u>2,000</u>
Total Variable Cost	= ₹ <u>12,000</u>

Option I

If both the orders came together, learning rate 80% applies and 8 units can be made, with average time of 1,024 hours per unit.

Cost to PQ:

Variable cost excluding labour cost	= ₹ 12,000
Labour cost 1,024 hrs × ₹ 4 per hour	= ₹ <u>4,096</u>
	= ₹ <u>16,096</u>

In this case,

	Y	X	
I Selling Price p. u.	₹ 17,200	₹ 16,500	→ (under option I)

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II	Variable Cost p. u.	₹ 16,096	₹ 16,096	
III	Contribution p. u. [I – II]	₹ 1,104	₹ 404	
IV	No. of units	4	4	
V	Contribution (₹) [III × IV]	4416	1616	6032

Option II

If X Ltd supplies its labour. 80% learning curve will apply to 4 units each of PQ & X.

Hence: hrs/unit = 1280

	Y	X	
I	Selling Price	₹ 17,200	₹ 14,000
II	Variable Cost (excl. labour)	₹ 12,000	₹ 12,000
III	Labour cost:		
	1280 × 4	₹ 5,120	
	1280 × 1		₹ 1280
IV	Total Variable Cost	₹ 17,120	₹ 13,280
V	Contribution [I – IV]	₹ 80	₹ 720
VI	Units	4	4
VII	Contribution (₹) [V × VI]	320	2,880
			3,200

PQ should not take labour from X Ltd. It should choose option I.

Question 19

Ret Ltd., a retail store buys computers from Comp Ltd. and sells them in retail. Comp Ltd. pays Ret Ltd. a commission of 10% on the selling price at which Ret sells to the outside market. This commission is paid at the end of the month in which Ret Ltd. submits a bill for the commission. Ret Ltd. sells the computers to its customers at its store at ₹ 30,000 per piece. Comp Ltd. has a policy of not taking back computers once dispatched from its factory. Comp Ltd. sells a minimum of 100 computers to its customers.

Comp Ltd. charges prices to Ret Ltd. as follows:

₹ 29,000 per unit, for order quantity 100 units to 140 units.

₹ 26,000 per unit, for the entire order, if the quantity is 141 to 200 units. Ret Ltd. cannot order less than 100 or more than 200 units from Comp Ltd.

Due to the economic recession, Ret Ltd. will be forced to offer as a free gift, a digital camera costing it ₹ 4,500 per piece, which is compatible with the computer. These cameras are sold by another Co., Photo Ltd. only in boxes, where each box contains 50 units. Ret Ltd. can order the cameras only in boxes and these cameras cannot be sold without the computer.

In its own store, Ret Ltd. can sell 110 units of the computer. At another far of location, Ret Ltd. can sell upto 80 units of the computer (along with its free camera), provided it is willing to

spend ₹ 5,000 per unit on shipping costs. In this market also, the selling price that each unit will fetch is ₹ 30,000 per unit.

You are required to:

- (i) State what is Ret's best strategy along with supporting calculations.
- (ii) Compute the break-even point in units, considering only the above costs.

Answer

(a)

Particulars	Order Qty 100-140 (₹)	Order Qty 141-200 (₹)
I Selling Price ₹ /unit	30,000	30,000
II Commission @ 10%	3,000	3,000
III Sales revenue p. u. [I + II]	33,000	33,000
IV Less: Variable purchase cost	29,000	26,000
V Contribution / unit (before shipping) [III – IV]	4,000	7,000
VI Less: Shipping cost > 110 units		5,000
VII Contribution/ units after Shipping [V – VI]		2,000

- (i) Upto 110 units, Reference will earn a contribution of ₹ 4,000/u.
- (ii) Between 110 & 140 units, contribution of 4,000 will be wiped out by 5,000 on shipping costs. Hence we should not consider 110 – 140 range.
- (iii) 101 – 110 not to be considered since additional fixed costs 2,25,000 will not be covered by 10 units.
- (iv) Valid consideration, 100 units or 141 to 190 units.

Fixed cost of box of 50 cameras is ₹ 2,25,000

Units		100	141	150	190
No. of Camera Boxes	A	2	3	3	4
Cost of Cameras (₹)	B	4,50,000	6,75,000	6,75,000	9,00,000
Contribution (₹/u) ₹ 4,000	C	400,000			
Contribution (₹) first 110 units @ 7,000/u	D		7,70,000	7,70,000	7,70,000
Contribution (₹) Balance units @ 2,000/u	E		62,000	80,000	1,60,000
Total Contribution (F = C + D + E) (₹)	F	4,00,000	8,32,000	8,50,000	9,30,000
Profit (F) – (B) (₹)	G	- 50,000	1,57,000	1,75,000	30,000

2.28 Advanced Management Accounting

Best strategy buy 150 units from Comp. Ltd., sell 110 at store and 40 outside.

BEP should be between 151 – 191 units

Extra Camera box cost beyond 150 units = ₹ 2,25,000

Less: Profit for 150 units = ₹ 1,75,000

Extra profit acquired = ₹ 50,000

No. of units to cover this additional costs at contribution 2000 ₹ /u = $\frac{50,000}{2,000} = 25$

\ BEP = 150 + 25 = 175 units

Alternative Solution

The problem involves fixed cost of 50 Computers i.e ₹ 2,25,000 for incremental sale of 50.

	Units sold			
	110	140	150	190
Margin per unit = Sales price – buying price + commission (₹)	4000	4000	7000	7000
Margin (Excluding shipping cost)	4,40,000	5,60,000	10,50,000	13,30,000
Shipping cost (₹)		30 x 5000	40 x 5000	80 x 5000
For sale beyond 110 units		= 1,50,00	= 2,00,000	= 4,00,000
Contribution (₹)	4,40,000	4,10,000	8,50,000	9,30,000
Fixed cost (Cost of Computers)	6,75,000	6,75,000	6,75,000	9,00,000
Profit	-2,75,000	-2,65,000	1,75,000	30,000

Best strategy is sales level at 150 units.

The variations of profit is due to incremental fixed cost.

From the profits at different levels, it is seen that the BEP lies between 151 and 190.

Let BEP = X Units

Margin = 7000 X

Shipping Cost = (X -110)x 5000

Cost of Computers = ₹ 9,00,000

We have, 7000 X = (X -110) x 5000 + 900000

Or 7X = 5X – 550 +900

Or 2X = 350 or X = 175

Thus, BEP = 175 units.

Question 20

A company can make any one of the 3 products X,Y or Z in a year. It can exercise its option only at the beginning of each year.

Relevant information about the products for the next year is given below.

	X	Y	Z
Selling Price (₹/unit)	10	12	12
Variable Costs(₹/unit)	6	9	7
Market Demand (unit)	3000	2000	1000
Production capacity (unit)	2000	3000	900
Fixed Costs (₹)			30,000

You are required to compute the opportunity costs for each of the products.

Answer

	X	Y	Z
I Contribution per unit (₹)	4	3	5
II Units (lower of production/ market demand)	2000	2000	900
III Possible Contribution (₹) [I × II]	8000	6000	4500
IV Opportunity Cost (₹)	6000	8000	8000

(Note: Opportunity cost is maximum benefit forgone.)

Question 21

Bloom Ltd. makes three products, A, B and C. The following information is available:

	(Figures in Rupees per unit)		
	A	B	C
Selling price (peak-season)	550	630	690
Selling price (off-season)	550	604	690
Material cost	230	260	290
Labour (peak-season)	110	120	150
Labour (off-season)	100	99	149
Variable production overhead	100	120	130
Variable selling overhead (only for peak-season)	10	20	15
Labour hours required for one unit of production	8	11	7 (hours)

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Material cost and variable production overheads are the same for the peak-season and off-season. Variable selling overheads are not incurred in the off-season. Fixed costs amount to ₹ 26,780 for each season, of which ₹ 2,000 is towards salary for special technician, incurred only for product B, and ₹ 4,780 is the amount that will be incurred on after-sales warranty and free maintenance of only product C, to match competition.

Labour force can be interchangeably used for all the products. During peak-season, there is labour shortage and the maximum labour hours available are 1,617 hours. During off-season, labour is freely available, but demand is limited to 100 units of A, 115 units of B and 135 units of C, with production facility being limited to 215 units for A, B and C put together.

You are required to:

- Advise the company about the best product mix during peak-season for maximum profit.
- What will be the maximum profit for the off-season?

Answer

Bloom Ltd.

Peak Season.

Statement of Contribution and BEP (in units)

Figures ₹

Product		A	B	C	
A.	Selling Price per unit	<u>550</u>	<u>630</u>	<u>690</u>	
	Variable Costs per unit:				
	Direct Material	230	260	290	
	Direct Labour	110	120	150	
	Variable Overhead – Production	100	120	130	
	Variable Overhead-Selling	<u>10</u>	<u>20</u>	<u>15</u>	
B.	Total Variable Cost	450	520	585	
C.	Contribution / unit (A – B)	100	110	105	
D.	Direct Labour hours / required per unit	8	11	7	
E.	Contribution per Labour Hour (C / D)	12.5	10	15	
F.	Ranking	II	III	I	
	General Fixed Overhead				20,000
	Specific Fixed overhead		2,000	4,780	<u>6,780</u>
G.	Total Fixed Overhead				26,780

H.	BEP (units) (for only 1 Product at a time) (G/C)	$\frac{20,000}{100} = 200$	$\frac{22,000}{110} = 200$	$\frac{24,780}{105} = 23$	
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Maximum units that can be produced of product C with limited labour hours 1,617.

$$= \frac{1,617}{7} = 231.$$

Since, 231 units are less than break even units

Hence, Bloom Ltd. cannot produce C.

Next rank = Product A

Maximum units of A that can be produced with limited labour hours = $\frac{1,617}{8} = 202$ units.

Break Even units of A = 200

\ Profit if only A is produced

	₹
Contribution = 202 × ₹100	20,200
Fixed Cost	<u>20,000</u>
Profit	<u>200</u>

Off Season

**Bloom Ltd.
Off Season
Statement of Contribution and demand**

Figures ₹ per unit

	Product	A	B	C	
A	Selling Price	550	604	690	
	Direct Material	230	260	290	
	Direct Labour	100	99	149	
	Production-Variable Overhead	<u>100</u>	<u>120</u>	<u>130</u>	
B	Total Variable Cost	430	479	569	
C	Contribution per unit (A - B)	120	125	121	
	Ranking	III	I	II	
	Maximum demand	100	115	135	
	Overall limit of production				215 units

2.32 Advanced Management Accounting

Statement of profitability under different options

(limit of production = 215 units)

	A	B	C	Total	Fixed Cost	Profit (loss)
Contribution per unit	120	125	121	-		
Option 1: Units	-	115	100	215		
Contribution (₹)	-	14,375	12,100	26,475	26,780	(305)
Option 2: Units	100	115	-	215		
Contribution (₹)	12,000	14,375	-	26,375	22,000	4,375
Option 3: Units	80	-	135	215		
Contribution (₹)	9,600	-	16,335	25,935	24,780	1,155

Best strategy is to produce 100 units of product A and 115 units of product B during off-season.

Maximum profit = ₹ 4,375.

(i) Best strategy for peak-season is to produce 202 units of A.

(ii) Maximum profit for off-season ₹ 4,375.

Question 22

A company has prepared the following budget for the forthcoming year:

	₹ lakhs
Sales	<u>20.00</u>
Direct materials	3.60
Direct labour	6.40
Factory overheads:	
Variable	2.20
Fixed	2.60
Administration overheads	1.80
Sales commission	1.00
Fixed selling overheads	<u>0.40</u>
Total costs	<u>18.00</u>
Profit	<u>2.00</u>

The policy of the company in fixing selling prices is to charge all overheads other than the prime costs on the basis of percentage of direct wages and to add a mark up of one-ninth of total costs for profit.

While the company is confident of achieving the budget drawn up as above, a new customer approached the company directly for execution of a special order. The direct materials and direct labour costs of the special order are estimated respectively at ₹ 36,000 and ₹ 64,000. This special order is in excess of the budgeted sales as envisaged above. The company submitted a quotation of ₹ 2,00,000 for the special order based on its policy. The new customer is willing to pay a price of ₹ 1,50,000 for the special order. The company is hesitant to accept the order below total cost as, according to the company management, it will lead to a loss.

You are required to state your arguments and advise the management on the acceptance of the special order.

Answer

Analysis of Cost and profit:

	₹ (lakhs)	₹ (lakhs)
Direct material	3.60	
Direct labour	<u>6.40</u>	
Prime cost		10.00
Overhead:		
Variable factory overhead	2.20	
Fixed factory overhead	2.60	
Administration overheads	1.80	
Selling commission	1.00	
Fixed selling overheads	<u>0.40</u>	<u>8.00</u>
Total cost		18.00
Profit		<u>2.00</u>
Rate of profit on costs (2/18) = 1/9		

Overhead absorption rate based on direct wages = $(8.00 / 6.40) \times 100 = 125\%$ of direct wages

Break up of new order:

	₹
Direct Materials	36,000
Direct Labour	64,000
Overheads 125% of direct wages	80,000

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Total costs	1,80,000
Profit 1/9	20,000
Selling Price	2,00,000

The following points emerge:

- Factory overheads only are to be recovered on the basis of direct wages.
- The special order is a direct order. Hence commission is not payable.
- The budgeted sales are achieved. Hence all fixed overheads are recovered. Hence, no fixed overheads will be chargeable to the special order.

Based on the above, the factory variable overheads recovery rate may be calculated as under:

Total variable factory overheads ₹ 2.20 lakhs

Direct wages ₹ 6.40 lakhs

Factory overhead rate = $(2.20 / 6.40) \times 100 = 34.375\%$

Applying this rate the cost of the special order will be as under:

	₹
Direct materials	36,000
Direct labour	64,000
Overheads 34.375% of direct wages	22,000
Total costs	1,22,000
Price offered	1,50,000
Margin	28,000 (more than 1/9)

Hence, the order is acceptable at the price of ₹ 1,50,000.

Question 23

Lee Electronic manufactures four types of electronic products, A,B,C and D. All these products have a good demand in the market. The following figures are given to you:

	A	B	C	D
Material cost (₹/u)	64	72	45	56
Machining Cost (₹/u @ ₹ 8 per hour)	48	32	64	24
Other variable costs (₹/u)	32	36	44	20
Selling Price (₹/u)	162	156	173	118
Market Demand (Units)	52,000	48,500	26,500	30,000

Fixed overhead at different levels of operation are :

Level of operation (in production hours)	Total fixed cost (₹)
Upto 1,50,000	10,00,000
1,50,000 – 30,00,000	10,50,000
3,00,000 – 4,50,000	11,00,000
4,50,000- 6,00,000	11,50,000

At present, the available production capacity in the company is 4,98,000 machine hours. This capacity is not enough to meet the entire market demand and hence the production manager wants to increase the capacity. The company wants to retain the customers by meeting their demands through alternative ways. One alternative is to sub-contract a part of its production. The sub-contract offer received as under :

	A	B	C	D
Sub-contract Price (₹/u)	146	126	155	108

The company seeks your advice in terms of products and quantities to be produced and/or sub-contracted, so as to achieve the maximum possible profit. You are required to also compute the profit expected from your suggestion.

Answer

Demand (Units)	52,000	48,500	26,500	30,000
	A	B	C	D
Direct Material	64	72	45	56
M/c	48	32	64	24
Other Variable Cost	<u>32</u>	<u>36</u>	<u>44</u>	<u>20</u>
Total Variable Cost	<u>144</u>	<u>140</u>	<u>153</u>	<u>100</u>
Selling Price	162	156	173	118
Contribution (₹ /u)	18	16	20	18
M/s Hours per unit	6	4	8	3
Contribution (₹ / M/c hr.)	<u>3</u>	<u>4</u>	<u>2.5</u>	<u>6</u>
Ranking	III	II	IV	I
Sub-Contract Cost ₹ /u)	146	126	155	108
Contribution (₹ /u) on (Sub-Contract)	16	30	18	8

Decision: It is more profitable to sub-contract B, since contribution is higher sub-contract.

1st Level of Operations: 1,50,000 hours, Produce D as much as possible.

Hours required = 30,000 units × 3 = 90,000 hours

Balance hours available: 60,000 hours.

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Produce the next best (i.e. A, Since B is better outsourced)

$$\frac{60,000 \text{ hrs}}{6 \text{ hrs/u}} = 10,000 \text{ units of A.}$$

1st Level of Operation:

		Contribution/units	Contribution (₹)
A	Produce 10,000 units	18	1,80,000
A	Outsource 42,000 units	16	6,72,000
B	48,500 units		
	Outsource fully	30	14,55,000
C	26,500 units		
	Outsource fully	18	
D	30,000 units		
	Fully produce	18	5,40,000
	Total Contribution:		33,24,000
	Less: Fixed cost		10,00,000
	Net Gain		23,24,000

2nd Level of Operation:

Both A and C increase contribution by own manufacture only by ₹ 2/- per unit. 1,50,000 hrs can produce 25,000 units of A.

\ Contribution increases by $25,000 \times 2 = 50,000$

(Difference in Contribution sub-contract and own manufacturing) = 2

But increase in fixed Cost = 50,000

At the 2nd level of operation, the increase in contribution by own manufacturing is exactly set up by increase in fixed costs by ₹ 50,000/-. It is a point of financial indifference, but other conditions like reliability or possibility of the sub-contractor increasing his price may be considered and decision may then be towards own manufacture.

3rd Level Additional: 1,50,000 hrs available

$$\begin{aligned} \text{Unit of A that are needed} &= [52,000 - 25,000 \text{ (2nd Level)} - 10,000 \text{ (1st Level)}] \\ &= 17,000 \text{ units} \times 6 \text{ hrs/u} = 1,02,000 \text{ hrs.} \end{aligned}$$

Balance 48,000 hrs are available for C to produce 6,000 units.

Increase in Contribution over Level 1st or 2nd :

$$\begin{aligned} \text{A: } 17,000 \times 2 &= ₹ 34,000 \\ \text{C: } 6,000 \times 2 &= ₹ 12,000 \\ &= ₹ 46,000 \end{aligned}$$

Increase in fixed costs = ₹ 50,000

Additional Loss = ₹ 4,000

4th Level Additional: 1,50,000 hrs can give $\frac{1,50,000}{8} = 18,750$ unit of C.

Increase in Contribution $18,750 \times 2 = ₹ 37,500$

Increase in Cost = (₹ 50,000)

Level 3rd loss c/fd = (₹ 4,000)

Level 1st profit will order by = (₹ 16,500)

Advice: Do not expand capacities; sell maximum

No. of units by operating at 1,50,000 hrs. capacity (level 1st) and gain ₹ 23,24,000.

Summary:

Product	Produce (Units)	Sub-Contract (Units)	Contribution (Production)	Contribution (Sub-Contract)	Total Contribution
A	10,000	42,000	1,80,000	6,72,000	8,52,000
B	-	48,500	-	14,55,000	14,55,000
C	-	26,500	-	4,77,000	4,77,000
D	30,000	-	5,40,000	-	5,40,000
					33,24,000
Fixed Cost					10,00,000
Profit					23,24,000

Question 24

E Ltd. is engaged in the manufacturing of three products in its factory. The following budget estimates are prepared for 2009-10 :

	Products		
	A	B	C
Sales (Units)	10,000	25,000	20,000
Selling price per unit. (₹)	40	75	85
Direct Materials per unit. (₹)	10	14	18
Direct wages per unit @ ₹ 2 p.hr.	8	12	10
Variable overhead per unit (₹)	8	9	10
Fixed overhead per unit (₹)	16	18	20
Profit/Loss	-2	22	27

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After the finalisation of the above manufacturing schedule, it is observed that presently only 80% capacity being utilised by these three products. The production activities are made at the same platform and it may be interchangeable among products according to requirement. In order to improve the profitability of the company the following three proposals are put for consideration:

- (a) Discontinue product A and capacity released may be used for either product B or C or equally shared. The fixed cost of product A is avoidable. Expected changes in material cost and selling price subject to the utilisation of product A's capacity are as under:

Product B : Material cost increased by 10% and selling price reduced by 2%

Product C : Material cost increased by 5% and selling price reduced by 5%.

- (b) Discontinue product A and divert the capacity so released and the idle capacity to produce a new product D for meeting export demand whose per unit cost data are as follows:

	₹
Selling Price	60
Direct material	28
Direct wages @ ₹ 3 per hr.	12
Variable overheads	6
Fixed cost (Total)	1,05,500

- (c) Product A, B and C are continuously run and hire out the idle capacity fixing a price in such a way that the same rate of profit per direct labour hour is obtained in the original budget estimates.

Required:

- Prepare a statement of profitability of products A, B and C in existing situation.
- Evaluate the above proposals independently and calculate the overall profitability of the company under each proposal.
- What proposal should be accepted, if the company wants to maximise its Profit?

Answer

- (i) Budgeted profitability statement under existing situation

	A (₹)	B(₹)	C (₹)	Total
Selling price	40	75	85	
Total Variable costs (Direct Material + Direct Labour +Variable overhead)	<u>26</u>	<u>35</u>	<u>38</u>	
Contribution	<u>14</u>	<u>40</u>	<u>47</u>	
Sales units	10000	25000	20000	

Contribution in (₹)	140000	1000000	940000	2080000
Fixed cost (₹)	<u>160000</u>	<u>450000</u>	<u>400000</u>	<u>1010000</u>
Profit/loss (₹)	<u>-20000</u>	<u>550000</u>	<u>540000</u>	<u>1070000</u>

- (ii) Proposal (a) Alternative use of A's Capacity for Product B or C or B & C Equally

Hours released for discontinuance of A = 10,000 x 4 = 40,000 hours

	Product B	Product C	B & C
No of Units Possible	40000/ 6 = 6666	40000/ 5 = 80000	B=3333 C= 4000

Revised Contribution of Product B and Product C

Particulars	B (₹)	C (₹)
Selling price	73.50	80.75
Variable cost: Direct Material	15.40	18.90
Direct wages	12.00	10.00
Variable overheads	9.00	10.00
Total Variable cost	36.40	38.90
Contribution	37.10	41.85
Number of Hours	6	5
Contribution per hour	6.18	8.37

Decision : It is better to produce C

Taking both changes in the selling price and material cost are for the entire production or the incremental production. Profitability is calculated below:

Proposal (a) : Profitability statement if A's capacity utilized by C

Particulars	Option 1 Changes for entire production (₹)	Option 2 Changes for incremental production (₹)
Sales Volume	28000	8000
Contribution per unit	41.85	41.85
Total Contribution	1,17,1800	3,34,800
Less Fixed Cost	400000	0
Profit	771800	334800
Existing Profit of B	550000	550000
Existing Profit of C		540000
Total Profit	1321800	1424800

Proposal (b)

Existing capacity = (4 x 10,000 + 6 x 25,000 + 5x 20,000) = 290000 hrs

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Then, Idle capacity of 20% = $.290000 / 4 = 72500$ hours

Capacity for product 'D' = (idle + A's spare) capacity = $72500 + 40000 = 112500$ hours,

No. of units 'D' produced = $112500/4 = 28125$ units.

Profitability Statement – proposal (b)

Units	D (₹)
Selling price	60
Less : Variable cost :	28
Direct wages	12
Variable Overheads	6
Contribution	14
Contribution amount (₹)	393750
Less fixed cost	105500
Profit	288250
Add : Existing Profit B & C	1090000
Total Profit	1378250

Proposal (c) Hiring Out idle capacity

Particulars	(₹)
Idle Hours	72,500
Existing Profit per hour ($1070000/290000$)	3.69
Revenue from Hire out	267500
Existing Profit	1070000
Total Profit	1337500

Profit Summary of alternatives (₹ in 000's)

Existing	Proposal(a) Option 1	Proposal (a) Option 2	Proposal (b)	Proposal (c)
1070.00	1321.80	1424.80	1378.25	1337.50

Decision on option on the basis of profitability :

- If price and cost under proposal (a) is for entire production of C: Proposal (b) of Export
- If price and cost under proposal (a) is for incremental prod C : Proposal (a) – Option 2

Question 25

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

Per unit	Part A	Part B
Alloy usage	1.6 kgs.	1.6 kgs.
Machine Time : Machine A	0.6 hrs.	0.25 hrs.
Machine Time :Machine B	0.5 hrs.	0.55 hrs.
Target Price (₹)	145	115

Total hours available : Machine A 4,000 hours

Machine B 4,500 hours

Alloy available is 13,000 kgs. @ ₹ 12.50 per kg.

Variable overheads per machine hours:

Machine A : ₹ 80

Machine B : ₹ 100

You are required to identify the spare part which will optimize contribution at the offered price.

If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machine hour, what will be the total contribution from the spare part identified above?

Answer

(i) Number of parts to be manufactured:

	Part A	Part B
Machine "A" (4,000 hours)	6666	16000
Machine "B" (4,500 hours)	9000	8181
Alloy available (13,000 hours)	8125	8125
Maximum number of parts to be manufactured	6666	8125
Cost per unit	₹	₹
Material (12.5 x 1.6)	20.00	20.00
Variable Overhead : Machine "A"	48.00	20.00
Variable Overhead: Machine "B"	50.00	55.00
Total variable cost per unit	118.00	95.00
Price offered	145.00	115.00
Contribution per unit	27.00	20.00
Total contribution for units produced (I)	179982	162500
Spare part A will optimize the contribution		

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(ii)

	Part A
Parts to be manufactured numbers	6666
Machine A : to be used	4000
Machine B : to be used	3333
Underutilized machine hours (4500 – 3333)	1167
Compensation for unutilized machine hours (II) (₹ 1167 x 60)	70020
Reduction in price by 10% causing fall in contribution of ₹ 14.50 per unit i.e (₹ 6666 x 14.5) (III)	96657
Total contribution (I + II -III)	153345

Question 26

A company has two divisions : Division A and Division B. Both divisions of the company manufacture the same product but located at two different places. The annual output of division A is 6000 tons (at 80% capacity) and that of division B is 7500 tons (at 60% capacity). The basic raw material required for production is available locally at both the places, but at division A, it is limited to 4000 tons per annum at the rate of ₹ 100 per ton, at division B, it is limited to 8000 tons per annum at the rate of ₹ 110 per ton. Any additional requirement of material will have to be purchased at a rate of ₹ 125 per ton from other markets at either of division. Variable costs per ton at each division remain constant. For every 1000 tons of output, 800 tons raw material is required. The details of other costs of the divisions are as follows:

	Division A	Division B
Other variable costs of output (₹)	122 per ton	120 per ton
Fixed cost per annum(₹)	3,80,000	6,00,000

Required:

- Calculate variable cost per ton for each division's product and decide ranking in order to preference.
- The company desires to fully utilize the available local supplies of raw material to save the overall variable cost of production; keeping the total production of both the divisions putting together is the same as at present level. Calculate the quantity of production (output) that could be transferred between the two divisions and overall saving in variable cost.
- After considering the option (ii), how the balance capacity should be utilized if company is working at 100% capacity, and also calculate selling price per ton if company mark up 10% on full cost of each division's product.

Answer

Variable cost per ton in different alternatives

Particulars	Division A		Division B	
	Local	Outside	Local	Outside
Material per ton	0.8	0.8	0.8	0.8
Rate per ton	100	125	110	125
Cost of material	80	100	88	100
Other Variable cost per ton	122	122	120	120
Total Variable Cost	202	222	208	220
Ranking	I	IV	II	III

Maximum production at both divisions $6000+7500 = 13500$ tons

Rank	Division	Market	Material	Output	Total	Balance
I	A	Local	4,000	5,000	5,000	13,500
II	B	Local	6,800	8,500	13,500	8,500
	Total		10,800	13,500		0

Statement showing saving in overall variable cost of proposed mix

Production (Current Mix)	Production (tons)	Variable cost per ton	Amount (₹)
Division A from local Market	5,000	202	10,10,000
Division A from outside Market	1,000	222	2,22,000
Division B from local Market	7,500	208	15,60,000
Total Variable Cost of Production	13,500		27,92,000
Production (Proposed Mix)			
Division A from local Market	5,000	202	10,10,000
Transfer from Division A to B as variable cost in Division B is less than other market cost $(6000-5000)=1000$ output required 800 tons input.	8,500	208	17,68,000
Total Variable Cost of Production	13,500		27,78,000

Transfer from Division A to Division B 1000 tons output will save in variable cost ₹ $2792000 - 2778000 = 14000$.

At 100% capacity the production is

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	Div A	Div B	Total
Output (in tons)	$6000/0.80 = 7,500$	$7500/0.6 = 12,500$	20,000
Output already used	5,000	8,500	13,500
Balance capacity (tons)	2,500	4,000	6,500
Input required (tons)	6,000	10,000	
Input locally available	4,000	8,000	
Input locally used	4,000	6,800	
Balance available (input local)	NIL	1,200	

Rank	Div	Market	Material	Output	Total	Balance Output
						6500
2nd	B	Local	1200	1500	1500	5000
3rd	B	Outside	2000	2500	4000	2500
4th	A	Outside	2000	2500	2500	NIL

Total cost of production and Selling price per tone

	Division A	Amount (₹)	Division B	Amount (₹)
Variable Cost	Output x VC		Output x VC	
Local Material	5000×202	10,10,000	$8500 + 1500 = 10000 \times 208$	20,80,000
Outside Material	2500×222	5,55,000	2500×220	5,50,000
Fixed Cost		3,80,000		6,00,000
TOTAL COST (full cost)		19,45,000		32,30,000
Profit		1,94,500		3,23,000
Selling Price		21,39,500		35,53,000
Selling Price per tonne		285.27		284.24

Alternative Answer

	Division A		Division B	
	Output	Raw Material	Output	Raw Material
Current production	6,000	4,800	7,500	6,000
Maximum Production	7,500		12,500	
Maximum production from Local Raw material	5,000	4,000	10,000	8,000

	Division A		Division B	
	Local Raw Material	Outside Raw Material	Local Raw Material	Outside Raw Material
Raw material cost per ton of output	80	100	88	100
Variable Overhead per ton of output	122	122	120	120
Total Variable Cost	202	222	208	220
Rank	I	IV	II	III
Current Mix (Output) M	5,000	1,000	7,500	-
Divisional subtotal of output	6,000		7,500	
Maximum Possible Output	5,000	2,500	10,000	2,500
Divisional subtotal of max. output	7,500		12,500	
Proposed optimal mix current output N	5,000	-	8,500	0

Savings in Variable Cost = $1000 \times (222 - 208) = 14,000$

(Difference between rows M and N)

	Division A		Division B	
	Local Raw Material	Outside Raw Material	Local Raw Material	Outside Raw Material
Maximum Prodn Capacity (Output)	5,000	2,500	10,000	2,500
Weighted average Variable Cost per tonne	$\frac{202 \times 2 + 222 \times 1}{3} = 208.67$		$\frac{208 \times 4 + 220 \times 1}{5} = 210.10$	

	Division A	Division B
Variable Cost per unit	208.67	210.40
Fixed Cost per unit	50.67	48.00
	380000/7500	600000/12500
Total Cost per ton	259.34	258.40
Markup @ 10%	25.93	25.84
Total Selling price per ton	285.27	284.24

Question 27

Maruthi Agencies has received an order from a valuable client for supplying 3,00,000 pieces of a component at ₹550 per unit at a uniform rate of 25000 units a month.

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Variable manufacturing costs amount to ₹ 404,70 per unit, of which direct materials is ₹ 355 per unit. Fixed production overheads amount to ₹ 30 lacs per annum, including depreciation. There is a penalty/reward clause of ₹ 30 per unit for supplying less/more than 25000 units per month. to adhere to the schedule of supply, the company procured a machine worth ₹ 14.20 lacs which will wear out by the end of the year and will fetch ₹ 3,55 lakh at the year end. After this supply of machine, the supplier offers another advanced machine which will cost ₹ 10.65 lakhs, will wear out by the year end and not have any resale value. If the advanced machine is purchased immediately, the purchaser will exchange the earlier machine supplied at the price of the new machine. Fixed costs of maintaining the advanced machine will increase by ₹ 14,200/- per month for the whole year. While the old machine had the capacity to complete the production in 1 year, the new machine can complete the entire job in 10 months. The new machine will have material wastage of 0.5%. assume uniform production throughout the year for both the machines.

Using incremental cost/revenue approach, decide whether the company should opt for the advanced version.

Answer

	Old (₹)	New (₹)	Incremental
Depreciation ₹ 14.2 lakhs – ₹ 3.55 lakhs	10,65,000	10,65,000	-
Fixed Cost increase		1,70,400	(-) 1,70,400
Resale value	+3,55,000	-	(-) 3,55,000
Material ₹ /u 355 x .5% 1.775 x 3,00,000		5,32,500	(-) 5,32,500
Increase in Costs in new Machine purchased			(-) 10,57,900
Penalty @ ₹ 30 per unit	-	-	
Reward @ ₹ 30 per unit 5000 per months x 10 months = 50,000 x 30 =			+ 15,00,000
Gain			<u>4,42,100</u>

Decision: Buy the advanced version.

Working Note:

1st machine 25,000 per month, no penalty, no reward

new machine: $\frac{3,00,000}{10} = 30,000$ per months

advance supply per month = 5,000

= 5,000 x 10 months = 50,000 units reward.

EXERCISE

Question 1

ZED Ltd. operates two shops. Product A is manufactured in Shop – 1 and customer's job against specific orders are being carried out in Shop 2. Its annual statement of income is:

	Shop-1 (Product-A) ₹	Shop-2 (Job Works) ₹	Total ₹
Sales/Income	<u>1,25,000</u>	<u>2,50,000</u>	<u>3,75,000</u>
Material	40,000	50,000	90,000
Wages	45,000	1,00,000	1,45,000
Depreciation	18,000	31,500	49,500
Power	2,000	3,500	5,500
Rent	5,000	30,000	35,000
Heat and Light	500	3,000	3,500
Other Expenses	<u>4,500</u>	<u>2,000</u>	<u>6,500</u>
Total	<u>1,15,000</u>	<u>2,20,000</u>	<u>3,35,000</u>
Net Income	10,000	30,000	40,000

The depreciation charges are for machines used in the shops. The rent and heat and light are apportioned between the shops on the basis of floor area occupied. All other costs are current expenses identified with the output in a particular shop.

A valued customer has given a job to manufacture 5,000 units of X for shop-2. As the company is already working at its full capacity, it will have to reduce the output of product-A by 50%, to accept the said job. The customer is willing to pay ₹ 25 per unit of X. The material and labour will cost ₹ 10 and ₹ 18 respectively per units. Power will be consumed on the job just equal to the power saved on account of reduction of output of A. In addition the company will have to incur additional overheads of ₹ 10,000.

You are required to compute the following in respect of this job.

- Differential cost;
- Full costs;
- Opportunity costs; and
- Sunk cost.

Advise whether the company should accept the job.

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Answer

ZED Ltd. should not accept the job as there will be a chase disadvantage of ₹ 42,750/- as computed below:

	₹	₹
Incremental revenue		
5,000 units @ ₹ 25	1,25,000	
Less: Sale of product A	<u>62,500</u>	62,500
Differential costs (a)		<u>1,05,250</u>
Cash disadvantage		<u>42,750</u>

Question 2

Indicate the major areas of short-term decisions in which differential cost analysis is useful.

Answer

1. Accept – or – reject special order decisions.
2. Make – or – buy decisions.
3. Sell – or – process decisions.
4. Reduce – or – maintain price decisions.
5. Add – or – drop product decisions.
6. Operate – or shut down decisions.

Question 3

“Relevant cost analysis helps in drawing the attention of managers to those elements of cost which are relevant for the decision.”

Answer

Refer Chapter 2: Paragraph: 2.1

Question 4

Briefly explain the concept of ‘Opportunity Costs’.

Answer

Refer to Chapter 2: Paragraph: 2.13

Question 5

Mahila Griha Udyog Industries is considering to supply its products – a special range of namkeens – to a departmental store. The contract will last for 50 weeks, and the details are given below:

<i>Material:</i>		₹
	<i>X (in stock – at original cost)</i>	<i>1,50,000</i>
	<i>Y (on order – on contract)</i>	<i>1,80,000</i>
	<i>Z (to be ordered)</i>	<i>3,00,000</i>
<i>Labour</i>		
	<i>Skilled</i>	<i>5,40,000</i>
	<i>Non-skilled</i>	<i>3,00,000</i>
	<i>Supervisory</i>	<i>1,00,000</i>
<i>General overheads</i>		<u><i>10,80,000</i></u>
<i>Total cost</i>		<i>26,50,000</i>
<i>Price offered by department store</i>		<u><i>18,00,000</i></u>
<i>Net Loss</i>		<u><i>8,50,000</i></u>

Should the contract be accepted if the following additional information is considered?

- (i) Material X is an obsolete material. It can only be used on another product, the material for which is available at ₹ 1,35,000 (Material X requires some adaptation to be used and cost ₹ 27,000).*
- (ii) Material Y is ordered for some other product which is no longer required. It now has residual value of ₹ 27,000).*
- (iii) Skilled labour can work on other contracts which are presently operated by semi-skilled labour at a cost of ₹ 5,70,000.*
- (iv) Non-skilled labour are specifically employed for this contract.*
- (v) Supervisor staff will remain whether or not the contract is accepted. Only two of them can replace other positions where the salary is ₹ 35,000.*

Overheads are charged at 200% of skilled labour. Only ₹ 1,25,000 would be avoidable, if the contract is not accepted.

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Answer

<i>Decision</i>	<i>Relevant costs (if contract is accepted)</i> ₹	<i>Relevant costs (if contract is rejected)</i> ₹
Total cash outflows: (B)	14,65,000	27,000
Net cash inflows: (A) – (B)	3,35,000	1,83,000

The net benefit on accepting the contract is: ₹ 3,35,000 – ₹ 1,83,000 = ₹ 1,52,000.

The contract should be accepted as it yields a net incremental cash inflow of ₹ 1,52,000.