

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.

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.
- (vii) Make or Buy decisions.
- (viii) Submitting tenders
- (ix) Lease or buy decisions
- (x) 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 – Rs.10/ hour

Direct labour under alternative II – Rs.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 Rs.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	Rs.75,000
Direct labour	Rs.65,000
Variable overhead	Rs.55,000
Fixed overhead:	
Factory supervision	Rs.35,000
Other fixed cost	<u>Rs.65,000</u>
Total production costs	<u>Rs.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 Rs.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.

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<i>Incremental Costs Per Unit</i>	<i>Make the Blades</i>
Direct materials (Rs.75,000 ÷ 10,000 units)	Rs.7.50
Direct labour (Rs.65,000 ÷ 10,000 units)	Rs.6.50
Variable overhead (Rs.55,000 ÷ 10,000)	Rs.5.50
Supervision (Rs.35,000 ÷ 10,000)	<u>Rs.3.50</u>
Total cost	<u>Rs.23.00</u>

Compare the cost to make the blades for 10,000 motors. Rs.23.00, with the cost to buy, Rs.25.00 There is a net loss of Rs.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 Rs.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 Rs.45,000 per year, 'X' would face an opportunity cost associated with in house blade production for the 10,000 units of Rs.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.

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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
- (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 Rs. 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:

	Rs. in Lacs
Land (3 Grounds at Rs.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

Cost Concepts in Decision Making

Labour – Skilled	12
- Unskilled	8
- Supervisor's Salary	5
Overheads General	12
Depreciation	<u>006</u>
Total Cost	<u>150</u>

The Accountant also provides the following information:

Land: The total requirement of land is 3 grounds costing Rs.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 Rs.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 Rs.5 lacs after meeting all further expensed.
- (iii) Others: Material worth Rs.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 Rs.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 Ps.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 Rs.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 Rs.32 lacs and in a year's time it will be Rs.25 lacs.

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- (ii) *The general overheads includes both specific and absorbed overheads. If the contract is not undertaken, Rs.4 lacks 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 Rs.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.

Answer

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

(Figure in laksh of Rs.)

S. No.	Particulars	Basis for the cost to be relevant	Relevant cost if contract is accepted Rs.	Irrelevant cost if the contract is accepted Rs.
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	

Cost Concepts in Decision Making

Depreciation	-	6 (Sunk Cost)
Replacement cost of machine	7	
7. Estimated profit foregone on Opportunity other project foregone	10	
Total	93	

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

Working notes:

- | | | Rs. (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 Rs.10 lacs, it includes material worth Rs.2 lacs, relating to interior decoration, which is a sunk cost, this material can be sold for Rs.1 lac, (which is a relevant opportunity cost) and Rs.8 lacs, material is an incremental cost. Hence total relevant cost of others material is Rs.9 lacs. (Rs.8 lacs, incremental + Rs.1 lac, opportunity cost). | |
| 3. | Since the equipment can also be used on this contract. Its current replacement price is Rs.32 lacs, and after one year its cost will be Rs.25 lacs. Therefore the relevant opportunity cost of machine is: (Rs.32 lacs – Rs.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 Rs.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:

		<i>Department</i>
<i>Capacity Utilisation %</i>	A	75
	B	100
	C	70
	D	50

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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:

<i>Department</i>	<i>Hire Charges per Hour</i>	<i>Incremental Cost per Hour</i>
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 Rs.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 Rs.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:

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

<i>Departments</i>	<i>Available Capacity hours</i>	<i>Capacity utilized</i>		<i>Surplus Capacity hours</i>
		<i>(in %</i>	<i>in hours)</i>	
(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

Cost Concepts in Decision Making

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

<i>Production Department</i>	<i>Available capacity hours</i>	<i>Capacity utilization on 9,000 units</i> <i>Hours</i>	<i>Balance capacity hours</i>	<i>Unit per hour</i>	<i>Hours required for 3,000 additional units</i>	<i>Surplus capacity hours</i>
(1)	(2)	(3)	(4)=(2)×(3)	(5)	(6)	(8)=(5)-(7)
A	2,400	75	1,800	600	5 $\left(\frac{9,000 \text{ units}}{1,800 \text{ hrs.}}\right)$	600 Nil
B	2,400	100	2,400	Nil	3.75 $\left(\frac{9,000 \text{ units}}{2,400 \text{ hrs.}}\right)$	800 Nil
C	2,400	70	1,680	720	5.36 $\left(\frac{9,000 \text{ units}}{1,680 \text{ hrs.}}\right)$	560 160
D	2,400	50	1,200	1,200	7.5 $\left(\frac{9,000 \text{ units}}{1,200 \text{ hrs.}}\right)$	400 800

Alternative I

Statement of net Revenue (Under Alternative I)

<i>Production</i>	<i>Surplus capacity hours</i> <i>(Refer to W.N.-1)</i>	<i>Hire charges per hour</i>	<i>Total revenue in (Rs. Lacs)</i>	<i>Incremental costs per hour Rs.</i>	<i>Total cost in (Rs. Lacs)</i>	<i>Net revenue in (Rs.)</i>
	(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

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Add: present income (10% of Rs.1,800 lacs)	<u>180.00</u>
Total return	<u>189.96</u>

Return on investment

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

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 (Rs.Lacs)	Incremental costs per hour Rs.	Total cost in (Rs. Lacs)	Net revenue in (Rs. 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 × Rs.1,600) 48.00

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

Total Return (in lacs) 231.69

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

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 Rs.75,000, but that are now obsolete and have a scrap value of only Rs.21,000. Other than selling the material for scrap, there are only two alternative uses for them.

Cost Concepts in Decision Making

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

<i>Material A</i>	<i>600 units</i>
<i>Material B</i>	<i>1,000 units</i>
<i>Direct Labour</i>	
<i>5,000 hours unskilled</i>	
<i>5,000 hours semi skilled</i>	
<i>5,000 hours highly skilled</i>	
<i>Extra selling and delivery expenses</i>	<i>Rs.27,000</i>
<i>Extra advertising</i>	<i>Rs.18,000</i>

The conversion would produce 900 units of saleable product and these could be sold for Rs.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 Rs.390 per unit and incurs total variable cost (excluding Material B) of Rs.210 per unit. Each unit of product Z uses four units of Material B. The details of Materials A and B are as follows:

	<i>Material A</i>	<i>Material B</i>
	<i>(Rs.)</i>	<i>(Rs.)</i>
<i>Acquisition cost at the time of purchase</i>	<i>100 per unit</i>	<i>Rs.10 per unit</i>
<i>Net realizable value</i>	<i>85 per unit</i>	<i>Rs.18 per unit</i>
<i>Replacement cost</i>	<i>90 per unit</i>	<i>-</i>

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:

<i>Material C</i>	<i>1,000 units</i>
<i>Direct Labour:</i>	
<i>4,000 hours unskilled</i>	

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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 Rs.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 Rs.1,050 per unit for that quarter.

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:

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

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

Variable overhead	Re.1 per direct labour hour
Fixed overhead	Re.2 per direct labour hour
Unskilled labour	Re.3 per direct labour hour
Semi-skilled labour	Re.4 per direct labour hour
Highly skilled labour	Re.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 Rs.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)

	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Sales revenue 900 units at Rs.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 @ Rs.90 per unit (Refer to working note 3)		54,000	
Material B – 1,000 units @ Rs.45 per unit (Refer to working note 4)		45,000	
Direct Labour:			
Unskilled – 5,000 hours @ Rs.3 per hour	15,000		
Semi-skilled	Nil		
Highly skilled – 5,000 hours @ Rs.11 (Refer to working note 5)	<u>55,000</u>	70,000	
Variable overheads 15,000 hours @ Re.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 @ Rs.900 per unit		10,80,000	
Less: Revised spending – 900 units @ Rs.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 @ Rs.37 (Refer to working note 8)		37,000	

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Direct labour		
Unskilled – 4,000 hours @ Rs.3 per hour	12,000	
Semi-skilled	Nil	
Highly skilled – 4,000 hours @Rs.11 per hour (Refer to working note 5, 6)	<u>44,000</u>	56,000
Variable Overheads – 9,000 hours @ Re.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 Rs.8,000 (Rs.20,000 – Rs.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 Rs.2,70,000 if Alternative 1 is chosen.
2. Acceptance of either Alternative 1 or 2 will mean a loss of revenue of Rs.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 Rs.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 Rs.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 Rs.180 (Rs.390 – Rs.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 Rs.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 Rs.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 Rs.24 (given) or Rs.6 per hour of skilled labour. Hence the relevant labour cost will be Rs.6 (contribution lost per hour) + Rs.5 (hourly rate of skilled labour) i.e. Rs.11 per hour.

6. It is assumed that for each direct labour of input, variable overhead will increase by Re.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 Rs.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 Rs.37 for each unit of material C that is manufactured, so the fixed overheads for material C viz. Rs.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. (May 2001)

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.

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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 (Rs.)	B Semi Automatic (Rs.)	C Fully Automatic (Rs.)
<i>Monthly fixed costs</i>			
Occupancy	15,000	15,000	15,000
Maintenance contract	0	3,000	10,000
Equipment lease	<u>0</u>	<u>25,000</u>	<u>1,00,000</u>
	<u>15,000</u>	<u>45,000</u>	<u>1,25,000</u>
<i>Unit variable costs (per report):</i>			
Supplies	40	80	20
Labour	5 hrs × 40	1 hr × 60	0.25 hr × 80
	<u>or 200</u>	<u>or 60</u>	<u>or 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 (Rs.)	A and C (Rs.)	B and C (Rs.)
Differential fixed costs: (I)	30,000	1,10,000	80,000
	(Rs.45,000 – Rs.15,000)	(Rs.1,25,000 – Rs.15,000)	(Rs.1,25,000 – Rs.45,000)
Differential variable costs per case: (II)	100	200	100
	(Rs.240 – Rs.140)	(Rs.240 – Rs.40)	(Rs.140 – Rs.40)

Cost Concepts in Decision Making

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.

- (ii) 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.

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) Rs.	Shop-2 (Job Works) Rs.	Total Rs.
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 Rs.25 per unit of X. The material and labour will cost Rs.10 and Rs.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 Rs.10,000.

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

- (a) Differential cost;
- (b) Full costs;
- (c) Opportunity costs; and
- (d) Sunk cost.

Advise whether the company should accept the job.

Advanced Management Accounting

Answer

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

	Rs.	Rs.
Incremental revenue		
5,000 units @ Rs.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>Rs.</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>	<i><u>10,80,000</u></i>
<i>Total cost</i>	<i>26,50,000</i>
<i>Price offered by department store</i>	<i><u>18,00,000</u></i>
<i>Net Loss</i>	<i><u>8,50,000</u></i>

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 Rs.1,35,000 (Material X requires some adaptation to be used and cost Rs.27,000).*
- (ii) Material Y is ordered for some other product which is no longer required. It now has residual value of Rs.27,000).*
- (iii) Skilled labour can work on other contracts which are presently operated by semi-skilled labour at a cost of Rs.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 Rs.35,000.*

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

Advanced Management Accounting

Answer

<i>Decision</i>	<i>Relevant costs (if contract is accepted) Rs.</i>	<i>Relevant costs (if contract is rejected) Rs.</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: Rs.3,35,000 – Rs.1,83,000 = Rs.1,52,000.

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