

2ND ICA-JAPAN TRAINING PROGRAMME ON
COSTING
(COST & MANAGEMENT ACCOUNTING)

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COSTING
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2ND ICA-JAPAN TRAINING COURSE
ON
Enhancement of Farmers' Income & Poverty
Reduction through Co-operatives.

IRMA Module on Project Management in Agricultural Co-operatives

: Subject :
COSTING (COST & MANAGEMENT ACCOUNTING)

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INTRODUCTION

Several Accounting subjects are practiced in professional world which include Financial Accounting, Cost Accounting, Management Accounting, Managerial Accounting and Analytical Accounting.

All these accounting theories deal in the data which is useful to different categories of people and are used for different purposes. Therefore, all accounting practices differ only in ultimate objective for which they are observed and thus process followed for handling the data differs.

Analytical Accounting is the name of Cost Accounting. This name - analytical accounting is widely used in American and European countries; while Managerial Accounting is the name of Management Accounting. The latter words are widely used all over the globe.

Cost defined

Cost is the amount of resources used for producing or for acquiring products and/or services.

A Biscuit pack is selling @ Rs.10/- . This includes profit margin @ 10 % on selling price and Re.1/- for advertisement expenses and for distribution expenses.

Thus, Selling Price	Rs.10/-
Less: Margin @ 10 %	<u>Re. 1/-</u>
Remaining is Cost	Rs. 9/-
(Cost of goods sold)	
Less: Advert. & Distri.exp.	<u>Re. 1/-</u>
Remaining Cost	Rs. 8/-
(Cost of Production)	

The cost of Rs.8/- per pack includes cost of material ingredients used in manufacture of biscuits (direct material cost), cost of manpower attending the machines / furnaces (direct labour cost) and includes power of the machines, water consumed, lubrication etc (direct expenses). Besides, other expenses like wages to maintenance workers, salary to supervisors, managers and other administrative staff, traveling expenses, telephone bills, light bills, printing & stationery cost, security expenses etc are also incurred in the work place where the biscuit production is taking place. These are indirect expenses. Sum total of all these expenses is called Cost of Production. When expense is incurred to market the

product and to send to destinations they are selling and distribution cost which is added to cost of production and the grand total becomes Cost of Sales which is compared with Sale Price and margin works out.

Cost Elements

Various heads (direct material, direct labour, direct labour, indirect expense, selling expense etc.) of expenses are known as Cost Elements.

Cost Centers

Various functions/processes/service depts. in an organization which are the consumers of resources or on which expense is incurred are known as Cost Centers. The cost is ascertained for these processes/depts. and unit cost is worked out for each of them based on achieved output. Thus calculated unit cost for each process is added up to arrive at total cost of sales.

Costing defined.

Costing is a process of ascertaining the cost of products or services.

As explained earlier, cost of sale includes several elements of cost namely direct material, labour and expenses and indirect expenses. All these cost are incurred at different locations under charge of different people who are doing different activities but are working for one common goal of production and sales.

For example: direct material cost takes place at three locations – Purchase function, Stores and Production shopfloor. Quantity of material issued for consumption has to be ascertained from Stores, its landed cost (basic price + other incidental expenses –freight, taxes etc) has to be picked up from the records of Purchase dept. and the quantity actually consumed (input) for received production (output) has to be ascertained from Production dept. For labour cost, machine-wise attendance is reported by production dept. while wage rate and other deductions etc are gathered from HR and Personnel dept. and so on.

Whole this process of collecting every data pertaining to quantity of consumption and stocks and pertaining to rates and other expenses from various functional departments of any organization (whether Business orgn or Non-Business orgn.) is called a Process of Ascertainment of Cost. This is called Costing.

Essential Steps of Costing

01. Collection of expenses;
02. Classification of expenses according to cost elements;
03. Allocation of expenses to the cost centers;

04. Apportionment of expenses to the cost centers,
05. Collection of output quantities;
06. Working out cost per unit of output.

Cost Accounting defined .

There are several procedures , methods and principles on the basis of which ascertainment of cost takes place so as to ensure that thus ascertained cost is authenticated, supported by facts, recorded at originating source for future references, free from errors and its relevance in the current context is maintained. These processes, methods and principles have been the result of thorough deliberations given by Management Experts who have worked in the organizations for years together, the essence of practices which have been followed commonly all over the world and which have yielded desired results in data collection, analysis and use for effective operation of organizations.

Thus, Cost Accounting is the process of Costing by putting into practice/by using the procedures, methods and principles of cost ascertainment, cost calculation, cost analysis and cost reporting.

Cost Accountancy defined.

This subject which defines concept of cost, methods of cost accounting and importance of cost accounting is Cost Accountancy.

Thus, this is the widest term which incorporates:

- a. theoretical understanding about cost;
- b. different types of cost (Actual cost, Notional cost, opportunity cost, relevant cost, sunk cost etc);
- c. items which are not cost (bad debts, donations etc);
- d. principles which have to be born in mind for applying costing methods as per products;
- e. methods of making cost presentable to management for decision making and methods of using cost accounting for control purposes.
- f. specific nomenclature of accounts for debiting and crediting cost items so that a reconciliation can be made between Costing P&L a/c and Financial P&L A/c

Management Accounting defined.

The cost data are required by Management people at different levels unto Top level. They use these data for;

01. Knowing the total performance and relative performance of each function and of the organization as a whole;
02. They analyze the data by "Exceptions" i.e. they examine the weak areas and apply resources for removing weakness;
03. They use the data for future planning for expansion, new products, services, activities etc;
04. They use the data for making decisions on various issues which include "Buy or Make" , "Stop or Continue", "Accept or reject order" , "Export or do not do", "Go for replacement of equipments" ,"Capital Investment", "Incentives to employees" etc.;
05. They use the data for Control and Reduction of Cost, bringing financial discipline in the organization;
06. They use the data for sharing with other organization for Inter-Firm comparison for benchmarking the performance parameters in the industry.

The Costing People analyze the data and report them to various levels of management in pre-defined formats on specified days/dates and also report them as per need of the users without such formats and dates. While doing so the Costing people are also involved in deliberations, discussions and decision making process that goes on in the management.

Whole of this function of Cost Accounting People is known as Management Accounting.

Management Accounting is, therefore, the function of preparing, reporting and discussing Cost data for routine and management of specific issues in the organization where decision making and control functions are involved.

Thus, Management Accounting is a function of Cost Accounting, Reporting and Controlling the operations by adhering to Cost data based management.

Principles of Cost Accounting

01. Relation: The cost should be related to their causes i.e. Cost Centers;
02. Abnormal Cost to be excluded: As this cost does not relate to normal activity of the organization, it should be excluded from cost computations;
03. Past Cost to be excluded: Cost relating to earlier years should not be charged to current production;

04. Future Cost to be excluded: Cost probable in future should not be charged to current production. Selling & Distribution overheads (expenses –known as overheads in cost accounting term) should not be apportioned over the finished goods in stores.

Financial Accounting defined

Financial Accounting means commercial recording, analysis and reporting of transactions which take place in an organization during a defined period.

This branch of accounting takes a note of every finance related transaction for making an authenticated record, tallying funds, arranging funds, keeping the funds safe and secured, getting the records audited and reporting to Management, Bankers, Creditors and other outside agencies.

Thus, the purpose of this accounting method is macro i.e. Funds, Recording, Reporting and Safety.

Difference between Cost & Management Accounting and Financial Accounting :

Biggest difference is the purpose. Purpose of Cost & Management Accounting is micro rather than macro i.e. this is done for internal purpose which help in managing the organization on routine and specific issues which have a direct bearing upon earning or spending funds. This is a purpose which is very distinct from that of Financial Accounting as explained earlier. Besides this, there are other differences which are in formats, period, law, principles, methods etc.

One point is highest noteworthy in this section.

The source data is same for both Cost Accounting and for Financial Accounting i.e. a record of a Transaction.

Thus, on purchase of an item, Cost Accounting also takes rates and incidental expenses from purchase vouchers and cash vouchers and for costing the material quantity consumed and for valuation of remaining stock of that material and Financial Accounting also takes values of purchases and other incidental expenses from same invoices and books in purchase day book, goods purchase a/c and other nominal accounts.

Differences Charted out.

Points of Difference	Financial Accounting	Cost Accounting	Management Accounting.
01. Orientation	This is concerned with money as the economic resource.	This is concerned with purpose of spending money.	This is concerned with all situations i.e. monetary and non-monetary economic events from the point of view of management.
02. Scope	The financial aspect is dealt with by preparing Trading a/c, P&L a/c and Balance Sheet. This accounts for all expenses and income for the relevant period.	This aims at measuring economic performance of Cost Centers. This excludes certain expenses in cost computations.	This is a way of incorporating data of financial accounting, cost accounting and financial management to assist the management in control and decision making. This acts as per needs in a situation for inclusion or exclusion of certain expenses.
03. Analysis of performance.	This indicates the position of the business as a whole in the final accounts prepared for reporting an overall performance of business.	This is basically concerned with collection, classification, analysis and reporting cost and profitability data of each cost center.	This uses cost data and financial data for functional analysis, for control of current operations and for planning for future operations.
04. Time factor	This focuses attention on past and current operations.	This also does same.	This concentrates on future operations, profitability improvement etc.
05. Legal compulsions	This is compulsory for every organization.	It is compulsory to maintain Cost Records in some industries and units, not in all.	There is no legal binding. However, this function does exist everywhere whether in professional form or in traditional form.

Expenses and Incomes excluded from Cost Accounts

The following expenses are excluded from Cost accounts even though these have been incurred in the current period as they do not have any contribution in manufacturing and selling products and / or services and are of incidental nature in the organizational activities. Since their existence can not be denied, they are taken care in financial accounting, however, are not allowed to vitiate cost of products/ services.

01. Cash discount;
02. Loss on sale of assets / store items and other capital losses;
03. Abnormal losses in procurement/production/sales which are not loaded on products/services and are directly charged to Costing P&L A/c.
04. Bad debts and Doubtful debts reserves ;
05. Other expenses written off;
06. Fines, penalties, donations, subscription, charities given.
07. Income tax, dividends paid and other appropriation of profits such as reserves.

Similarly following incomes are excluded from cost accounts :

01. Profit on sale of assets/ stores items and other capital profits;
02. Interest on investments, dividends received and interest on bank deposits;
03. Rent received;
04. Abnormal gains;
05. Fees received.

COST CLASSIFICATION

Cost data is same and leads to same total cost of production and cost of sale. But this is at times classified into various groups with a view to analyze data for different purposes. The classification is done as described in following paras :

A. Cost Classification to describe Functions:

01. Prime Cost : Includes Direct material, Direct labour, Direct expenses. This shows the function of manufacturing on machines.

02. Manufacturing Cost/Factory Cost / Works Cost : Includes , besides prime cost, indirect overheads incurred in manufacturing function.

03. Cost of Production : Includes manufacturing cost and administration overheads.

04. Cost of Sales : This is the total of Cost of Production of Goods Sold + Selling and Distribution overheads on Goods Sold.

B. Cost Classification to describe Behaviour of Cost :

B-1. Variable Cost : This is the element of cost which directly varies with the variation in quantity of production.

Example : Product A needs following input for one unit of output :

- a. ATOP 5 units @ Rs.20/unit.
- b. BTOP 6 units @ Rs.10/unit.
- c.. Labour 1 hour @ Rs.20/hour.
- d. Power 5 kwh @ Rs.5/kwh (unit)
- e. Office expenses. 10,000/- per month up to 1200 units. Above +10%.
- f. Production level 1,000 units, 1,200 units, 1,500 units.
per month.

Cost calculation

<u>Production Levels</u>	<u>1,000 units</u>	<u>1,200 units</u>	<u>1,500 units.</u>
Direct material Qty.			
ATOP @ Rs 20/unit	5,000 units	6,000 units	7,500 units
BTOP @ Rs. 10/unit	6,000 units	7,200 units	9,000 units.
<u>Cost</u>			
<u>Direct Material</u>			
ATOP	1,00,000	1,20,000	1,50,000
BTOP	<u>60,000</u>	<u>72,000</u>	<u>90,000</u>
Material Cost	1,60,000	1,92,000	2,40,000
Direct Labour cost	20,000	24,000	30,000
Direct Expenses-Power	<u>25,000</u>	<u>30,000</u>	<u>37,500</u>
Prime Cost (Variable Cost)	1,80,000	2,16,000	2,70,000
Variable Cost / Unit	Rs.180	Rs.180	Rs.180
Office expenses	10,000	10,000	11,000
Total Cost	1,90,000	2,26,000	2,81,000
 Total Cost / Unit	 Rs.190	 Rs.188	 Rs.187

The behaviour of cost as is clear in above example is :-

01. Variable cost in absolute figures increases vis-à-vis increase in production level while it remains at Rs.180 (total variable cost) at all levels of production.

Variable cost per unit is Fixed.

02. Office expenses are at Rs.10,000 per month whether production is 10,000 units or 12,000 units as they are FIXED.

03. But the office expenses change behaviour after crossing a level of 12,000 units and vary by 10 % without any reference to change in production level.

B-2. Fixed Cost

This is the cost which remains constant in absolute figure and does not change when the activity level changes. When this is calculated per unit, this changes vis-à-vis change in volume handled. In above example Office expenses for Rs.10,000/month are Fixed Cost.

Fixed cost per unit is Variable.

B-3. Semi Variable Cost

This is the cost which in absolute figure remains unchanged while there is a change in level of activity but changes after attaining a certain level of activity and then again becomes constant for next range of activities.

In above example – the Office Expenses are Fixed Cost up to a level of 12000 units production (Rs.10,000/month) and increase by 10% and becomes Rs.11,000/- for next level of 15,000 units.

This is an example of Semi Variable or Semi Fixed Cost.

C. Cost Classification to describe Assignment of Cost to Cost centers.

C-1. Direct Cost :

All items of cost are either directly identifiable or allocable to the products, services, cost centers, customers or activities which are undertaken by the organization in the process of manufacture, sale or serving the community.

Examples are : Raw material consumed product-wise, engagement of direct labour machine-wise/product-wise or for activities, power consumption on each cost center which is measurable, repairs, insurance of machines, locations etc.

Such cost is called Direct Cost. This can be Prime Cost, manufacturing cost, cost of production or cost of sales.

*Identification of consumer products/services for attaching that cost to it is called **Allocation of cost***

C-2 Indirect Cost

There are certain elements of cost which are incurred commonly for more than one products/services/customers or activities are not identifiable to any one product/service/activity. The benefit of such cost goes to entire work shop having several products or to entire utility section or to entire organization. Ultimately, such cost have to be born by the end products or services or activities of the organization and therefore such cost is loaded on end products on the basis of keys (No of persons, No of machines, Area occupied by machines/ persons, No of samples analyzed etc.)

Examples are : General maintenance of plant, painting of office building, salary of Administration and Accounts dept staff, Gardening expenses, Guest House expenses, Water consumed for drinking, Diesel consumed by Power Generating Sets etc.

*Such loading of cost to common cost centers in the absence of identification of specific consumer cost centre is known as **Apportionment of Cost**.*

Methods of Costing

Organizations adopt different methods by which they ascertain cost of products/services and use it for :

01. Knowing actual performance of the organization;
02. Control operations of the organizations;
03. Use it for decision making for present working and for future working.

The Methods are :

01. Absorption Cost Method : Every cost which has been incurred is allocated or apportioned to products/services to know cost of production and cost of sales. Thus,

direct cost , indirect cost which are of Variable nature or of fixed nature are taken into consideration which have been actually been incurred.

Test :

01. There is a sum of all cost of whatever nature;
02. There is actual incurrence of the cost.

02. Marginal Cost Method : In this method, only variable cost (exceptionally semi variable cost) is considered for the purposes explained above. Fixed costs are not taken into computation of cost of production/sale as the Fixed cost is regarded as Period cost which expires by lapse of time. Although, fixed cost is taken into consideration for decision making purposes. Examples are dealt in Annexure hereto.

Test :

01. There is a sum of only variable cost (direct material and other direct expenses, indirect variable expenses);
02. There is an actual incurrence of cost.

03. Standard Cost Method : In this method, cost is standardized and frozen. The same cost is used through out the period which is also pre-decided and is normally three months. Then the review takes place and changes are incorporated if required. Actual cost for the performance would be different but shall not be used for calculation of cost of production/sales, for decision making, for valuation of inventory or for any other purpose. While standardizing the material quantity consumption and rates, a reference is made to market trends, prevailing prices, inflation rate, political scenario and future market potential etc.

For Control and improvement purposes, the actual cost is compared with standard cost and differences are worked out .This is known as Variance Analysis. Variances could be favourable (actual cost being lower than standard cost) or Unfavorable. These variances are taken to Profit & Loss Account and costing work continues based on Standard Cost only.

Test :

01. The total cost is normally considered. This means the cost structure is based on variable cost and fixed cost of products/services.
02. Organization can choose a blend of Standard Marginal System of Costing;
03. There is no actual incurrence of cost; every element of cost which is used for accounting and management is predetermined cost. Actually incurred cost is considered only for variance analysis.

TERMINOLOGY

01. Differential Cost : This is the cost which differs between two alternative situation of decision making.

Example : An equipment is to be procured. This is locally available in the town which costs Rs.10,000/- and works for 3000 hours without maintenance. Similar machine is available at a place 100 kms away for Rs.7,000/- and also needs maintenance after 2000 hours. Cost of traveling and transportation works to Rs.1000/-.

While doing Cost-Benefit analysis, one will definitely analyze total cost including capital cost and maintenance cost , however, transportation cost in case of latter machine is a *differential cost* which will never be there for local equipment.

02. Opportunity Cost : An opportunity cost is a potential benefit that is given up by selecting one alternative over another. This is never incurred in cash and is notional but has a significant bearing upon financial situation of the organization.

Example : Additional funds of Rs.1,00,000/- are needed in the organization. The promoter brings in funds from his savings. These funds are used to introduce new products/service to society. While calculating cost and comparing with that of other brand, interest on Rs.1,00,000/- at prevailing rate is added to total cost. If bank deposit rate is 13 % p.a. then Rs.13,000/- per annum is the interest cost in total cost of production. There is no actual incurrence of cost however, the benefit of gaining this much interest from bank has been given up by investing fund into the business. This is Opportunity Cost. Similarly Rent of owned godown or other facilities.

03. Sunk Cost : This is such a cost which has already been incurred to create a facility which is no longer useful due to wear/tear or technological demands . The Cost of an equipment was Rs.25,000/- bought in 2006. The innovations have rendered this equipment out of use and new equipment is bought for Rs.30,000/- . The cost of production of product/service should not bear depreciation of obsolete equipment as it is out of use and the cost incurred on it is a Sunk cost which can not be recovered by normal activity of the organization.

04. Relevant Cost : This is the cost which has an impact on a decision exercise and can affect the decision while thinking on different alternative courses of action.

For example : A towel manufacturing company has a capacity to make 48,000 towels per month. It is currently making 30,000 towels per month due to less orders. The towels are selling @ Rs.50/unit.

It has a material cost and other variable cost of Rs.27/unit. Marketing Variable cost of Rs.5/unit is included in above cost. It has a fixed cost of Rs. 6,24,000 /- per month. If it gets an order of 5,000 towels from one Hotel chain at a price of Rs. 26/- per towel, should the order be accepted ?

As the capacity is for 48,000 towels, the fixed cost is for this capacity and producing 5,000 towels more shall not lead to any extra cost. As this order is from a hotel chain , no marketing cost is also needed. Thus offered price of Rs.26 is comparable with Rs.22 (Rs.27- Rs.5) and the order should be accepted.

Relevant Cost : Material and Variable cost excluding Marketing variable cost.

Irrelevant Cost : Fixed cost up to manufacturing level of 48,000 towels. If order is for a quantity which crosses 48,000 limit, the fixed cost also becomes relevant in deciding to accept or reject the order.

05. Period cost : This is the cost which is affected by time rather than level of activity.

For example : Salary, Telephone rent, Depreciation, Cost of Annual Maintenance Contract, Interest on borrowings, Insurance premium etc. These are of fixed nature. In above example : Fixed cost of Rs.6,24,000 is the period cost. This does not incur per unit of towel manufacturing but incurs per month.

06. Idle cost : This is also known as Idle Capacity Cost : The cost which has been incurred to create capacity of the plant or the organization to serve the community is capacity cost which is FIXED in the nature. When the available capacity is not utilized fully, the gap is known as Idle capacity cost or Idle cost.

For example : a proportion of Fixed cost of Rs.6,24,000 in above example , which represents 18,000 towels per month i.e. 48,000 towels capacity *minus* 30,000 towels capacity utilized, is the idle cost.

07. Conversion Cost : This is the cost which is incurred to convert Raw Material into Finished product and therefore the cost incurred in the processes is known as conversion cost . This is of Variable and Fixed nature.

MARGINAL COSTING SYSTEM

This system of cost accounting works on variable cost principle. The cost of products and services are those which are directly proportional to change in volume of production. This gives an effective tool in the hands of the management for decision making to accept or reject orders, how much to produce at minimum, to export or not etc.

The terms used in this method are :

01. Contribution : This is the difference between Sales price and Variable cost per unit .

Marginal cost system works on the principle that the Contribution contributes towards (01) Fixed Cost; and (02) Profit. This means-the contribution should be sufficient enough to take care of both of these elements.

Thus, it follows that :

- a. Contribution = Sale Price – Variable Cost
- b. Contribution = Fixed Cost + Profit
- c. Contribution % = (Contribution/ Sale Value) * 100
- d. Contribution/Unit = Contribution / Sale Quantity.

When Contribution is equal to Fixed Cost only then it is not contributing to PROFIT and thus is neither contributing to LOSS as well.

*This Situation is known as **BREAK EVEN POINT (BEP)** where No Profit-No Loss situation occurs at a given level of sales volume and rate.*

Break-Even Point represents a level of Sales either in Quantity or in Value at which organization with have "No Profit-No Loss" situation.

Formula – Sales at Break-Even Point (BEP) = $\frac{\text{Fixed Cost}}{\text{Contribution \% / per unit.}}$

Margin of Safety = Sales after Break-Even Sales.

MANAGEMENT ACCOUNTING & CONTROL

I Budgeting & Budgetary Control

Budgeting

Budgeting means to visualize future, to interact with work-force for future plans and to assign financial data to activities.

Budget means a plan of action which is quantified in monetary terms.

Level of Activity is planned. Every activity to achieve the level is assigned a cost. Revenues from operations are planned. A working is finalized based on planned Revenue and Cost. This gives Planned Profit / Loss (in business organizations) or Excess of Income over Expenditure or *vice-versa* in Non-business or Non-Profit organizations.

There is a elaborative and detailed approach to go through budgeting activity which is not discussed here for the fear of space and time.

Thus prepared Budget is the detailed document of quantity consumption, rates, costs, sales quantities, prices and revenues. It also details about cost of investment planned to be undertaken during the period under study (normally a budget is prepared for one year and is broken into quarterly budgets).

Thus a budget is a GUIDELINE for every one in the organization including Promoters and activities are controlled by reference to budget and the performance in every function is measured by comparison with the Budget.

Budget is a very very effective tool of Management for monitoring and control and a very helpful guide for Operating people at all levels for working under self discipline - provided an organization follows Budgetary control religiously.

Budgetary Control

When every spending / revenue is compared with budgeted data beforehand, the expense or the less revenue which is crossing budget limits is challenged by the monitoring authority and is allowed only after due deliberations and authentications of Final authority is Known as Budgetary Control. This immediately helps all time to ensure that budgeted results are going to be achieved and resources are being used judiciously.

Forecast :

This is also a planning of activities, happenings or non happenings without assigning cost and revenue data.

I I. Use of Data for Decision Making

All cost and revenue related data which are ascertained, analyzed and reported at various levels of management have definite purposes.

At Junior Level of Management – this data is useful to the recipients for the knowledge of results which have come out of their efforts and areas of improvement or areas of appreciation based on the performance.

At Middle Level of Management – this data is useful to further analyze the prevailing situation in the organization, any suggestive move that should be included in the reports, an acknowledgment to top management that the corrective action was warranted and has been taken under its guidance and control.

At Top Level of Management – this data is used for getting rid of stubborn situation, for adhering to different alternative actions, for overviewing the performance of whole team and for taking decisions which are normally of following types :

01. Change of some of input items for better cost efficiency and/or for better quality;
02. Change of incentive system for enhancement of working efficiency of work-force;
03. Increase in installed capacity;
04. For identifying and removing imbalance in capacity of preparatory plants;
05. For deciding whether an additional activity should be undertaken in the existing organization without any modification and investments;
06. For deciding whether an existing product/products should be allowed to continue or should be stopped and new products should be introduced;
07. For deciding whether organization should focus only on the existing line of activity or should initiate diversifying towards other activities/products/services etc.;
08. For deciding whether a "One-Time" order should be accepted or rejected;
09. For deciding whether Capital Investment as required by operating people or envisaged by top management should be undertaken or should be delayed;
10. For deciding the best option of Capital Investment;
11. For deciding about producing ownself or getting on jobwork;
12. For deciding ways to utilize idle capacity;
13. For deciding to change the lenders;

Similar nature of decisions are taken by top management with the help of analyzed cost, accounting and financial management data submitted to it.

The submission of these data to top management at fixed intervals and as per need based requirement with thorough analysis and comments by Management Accountant is known as Reporting which is a part of Management Information System i.e. MIS.

**ICA-2008: COST ACCOUNTING: SOLUTIONS TO EXERCISES GIVEN IN
STUDY MATERIAL.**

I COST SHEET PREPARATION

Prob-01 In a factory 20,000 units of Product A were manufactured in the month of October, 2007. Out of above, 18000 units were sold @ Rs.12/unit in the month. From the following figures obtained from the costing records, prepare a Cost Sheet showing Cost per Unit.

<u>Particulars</u>	<u>Amount(INR)</u>
Opening Raw Material	5,000
Purchase	55,000
Closing Stock of raw material.	10,000
Direct wages	25,000
Direct Expenses	10,000
Foremen's Salary	5,000
Workshop expenses	3,000
Godown rent	2,000
Factory Insurance	3,000
Diesel for D.G.sets	5,000
Plant repairs	2,000
Factory Building repairs	5,000
Factory Manager's salary	5,000
Telephone exp	3,000
Vehicle Mnt exp	3,000
Postage	1,000
Mobile Bill exp	4,000
Staff Salary	9,000
Sales staff salary	27,000
Sales Depot rent	5,000
Outward transportation expenses	6,000

Solution

Cost Sheet of Product A

Month : October,2007

Total Output : 20,000 Units
 Total Sales : 18,000 Units

Sl.No.	Particulars	Quantity	Rate Rs/Unit	Total Cost-INR	Cost Rs/unit
I	<u>Material Cost</u>				
	Opening Stock			5,000	
	Add : Purchase of raw material			55,000	
	Total			60,000	
	Less : Closing Stock			(10,000)	
	Net raw material consumption			50,000	2.50
	Direct Wages			25,000	1.25
	Direct Expenses			10,000	0.50
	PRIME COST			85,000	4.25
	II	<u>Factory overheades</u>			
Foremen's Salary				5,000	0.25
Workshop expenses				3,000	0.15
Godown rent				2,000	0.10
Factory Insurance				3,000	0.15
Diesel for D.G.sets				5,000	0.25
Plant repairs				2,000	0.10
Factory Building repairs				5,000	0.25
Factory Manager's salary				5,000	0.25
Total Factory overheads :				30,000	1.50
Manufacturing Cost/ Factory Cost			115,000	5.75	
III	<u>Administration overheads :</u>				
	Telephone exp			3,000	0.15
	Vehicle Mnt exp			3,000	0.15
	Postage			1,000	0.05
	Mobile Bill exp			4,000	0.20
	Staff Salary			9,000	0.45
	Total Admn.overheads :			20,000	1.00
Cost of Production			135,000	6.75	
IV	Cost of Production of Quantity Sold			121,500	6.75
	<u>Selling & Distribution overheads</u>				
	Sales staff salary			27,000	1.50
	Sales Depot rent			5,000	0.28
	Outward transportation expenses			6,000	0.33
	Total S & D overheads.			38,000	2.11
	Cost of Sales			159,500	8.86
	Sales Realisation			216,000	12.00
Costing Profit on Sale			56,500	3.14	

COST SHEET PREPARATION & INTER-FIRM COMPARISON

PROB.-02

Two Co-operative Societies engaged in Sugarcane production area in Uttar Pradesh (U.P.) and Maharashtra (M.S.) furnish following cost data.

From these data Cost of Production of Sugar per Quintal is required to be calculated for both the societies and reasons for the difference are to be explained.

Production	Unit of Measurement	U.P.Co-op. Soci.	M.S.Co-op. Soci.		
Production related data					
Sugarcane Production	'000 Tonnes	112,754	26,982		
Sugarcane Production-Quintals	'000 Quintals	1,127,540	269,820		
Area	'000 Hectares	2,299	377		
Yield = Prodn.(Tonnes) Per Hectare		49.04	71.57		
Yield = Prodn.(Quintals) Per Hectare		490	716		
Average Recovery	% age	9.14	10.96		
Sugar Production	'000 Tonnes	10,306	2,957		
Sugar Production	'000 Quintals	103,057	29,572		
Cost related data					
Input consumption/Hectare	Unit	U.P.Co-op.Soci.		M.S.Co-op.Soci.	
		Qty	Rate	Qty	Rate
Seed	Quintals	14	85.82	35	103.59
Fertilisers	Kgs of Nutrients	166	11.60	518	12.43
Manure	Quintals	9	22.94	27	51.43
Insecticides	Kgs	21	2.00	144	2.00
Human labour					
Casual	Manhours	420	6.66	1,400	7.31
Attached	Manhours	45	6.66	56	7.31
Family members	Manhours	673	6.66	718	7.31
Total Human labour	Manhours	1,138	6.66	2,174	7.31
Animal labour	Pair hours	13	21.15	76	27.41
Other Cost data/Hectare					
			Cost(INR)		Cost(INR)
Machine labour			557		5,884
Irrigation charges			2,025		7,268
Interest on working capital			585		2,351
Rental value of owned land			11,185		8,820
Rent paid for leased-in rent			29		-
Land revenue, cesses & taxes			292		28
Depreciation on implements			579		631
Interest on fixed capital			2,757		5,186
Society expenses share			2		13

COST SHEET OF SUGARCANE PRODUCTION									
Particulars	Unit	U.P.Co-op. Soci.				M.S.Co-op. Soci.			
		Qty	Rate	INR/Hectare	Cost/INR/Quintal	Qty	Rate	INR/Hectare	Cost/INR/Quintal
Sugarcane Production	Quintals/Hec	490				716			
<u>Direct Material</u>									
Seed	Quintals	14	86	1,226	2.50	35	104	3,628	5.07
Fertilisers	Kgs of Nutrients	166	12	1,922	3.92	518	12	6,440	9.00
Manure	Quintals	9	23	208	0.43	27	51	1,398	1.95
Insecticides	Kgs	21	2	43	0.09	144	2	288	0.40
Total RM Cost				3,399	6.93			11,753	16.42
<u>Direct Labour</u>									
<u>Human labour</u>									
Outside labour		465	6.66	3,095	6.31	1,456	7.31	10,648	14.88
Family labour(Opportunity Cost)		673	6.66	4,480	9.13	718	7.31	5,251	7.34
Total human labour		1,138	6.66	7,576	15.45	2,174	7.31	15,899	22.21
Animal labour	Pair hours	13	21.15	277	0.57	76	27.41	2,072	2.89
Machine labour	Direct			557	1.14			5,884	8.22
Total Labour Cost				8,410	17.15			23,854	33.33
<u>Direct Expenses</u>									
Irrigation charges				2,025	4.13			7,268	10.15
Total Direct Expense Cost				2,025	4.13			7,268	10.15
PRIME COST				13,834	28.21			42,875	59.91
Interest on working capital				585	1.19			2,351	3.29
EX - FARM COST				14,419	29.40			45,226	63.19
Rental value of owned land				11,185	22.81			8,820	12.32
Rent paid for leased-in rent				29	0.06			-	-
Land revenue, cesses & taxes				292	0.60			28	0.04
Depreciation on implements				579	1.18			631	0.88
Interest on fixed capital				2,757	5.62			5,186	7.25
Co-Op Soci.'s expenses				2	0.00			13	0.02
Farmer's managerial functions cost(Opportunity Cost)				2,926	5.97			5,990	8.22
Total Administration overheads				17,771	36.23			20,668	28.72
COST OF PRODUCTION				32,190	65.63			65,895	95.91
SALES REALISATION									
Value of Main Product				40,116	81.79			49,007	68.47
Value of by-product				2,504	5.11			3,904	5.45
Total Value				42,620	86.90			52,911	73.93
Difference				10,431	21.27			(12,984)	(18.14)

Prob-03 From the following data, relating to the manufacture of a standard product-BIGTONE during the month of Sept. 2007, prepare a statement showing cost and profit per unit.

Particulars	Amount(INR)
Raw material used	40,000
Direct wages	24,000
Man Hours worked	9,500
Man Hour Rate Rs/Hour	4.00
Office overheads	20 % on Works Cost
Selling overheads	Re.1 per unit
Units produced	20,000
Units sold	18,000
Sale Price Rs/Unit	10.00

Solution

Cost Sheet of Product BIGTONE					
Month : September ,2007					
Total Output :		20,000 Units			
Total Sales :		18,000 Units			
Sl.No.	Particulars	Quantity	Rate Rs/Unit	Total Cost-INR	Cost Rs/unit
I	Raw material consumption	-	-	40,000	2.00
	Direct Wages			24,000	1.20
	Direct Expenses			-	-
	PRIME COST			64,000	3.20
II	Factory overheads				
	Overheads absorbed on manhours			-	-
	Man-hours	9,500	4.00	38,000	1.90
	Total Factory overheads :			38,000	1.90
	Manufacturing Cost/ Factory Cost/ Works Cost			102,000	5.10
III	Administration overheads :	20% on WC		20,400	1.02
	Total Admn.overheads :			20,400	1.02
	Cost of Production			122,400	6.12
	Cost of Production of Quantity Sold			110,160	6.12
IV	Selling & Distribution overheads	Re.1/Unit		18,000	1.00
	Total S & D overheads.			18,000	1.00
	Cost of Sales			128,160	7.12
	Sales Realisation			216,000	10.00
	Costing Profit on Sale			87,840	2.88

Prob-04 Calculate Cost and Profit/Loss

Particulars	Amount(INR)
Opening Raw Material	7,500
Purchase	82,500
Direct wages	37,500
Direct Expenses	15,000
Earth Mover's rent	3,500
Workshop expenses	4,500
Godown rent	3,000
Factory Insurance	4,500
Diesel for D.G.sets	7,500
Plant repairs	3,000
Factory Building repairs	7,500
Factory Manager's salary	7,500
Administration Overheads	30% of Factory Cost
Sales Commission	10,000
Sales Staff Salary	30,000
Advertisement expenses	0.10% of Cost of Production
Units Produced and Sold	50,000
Sale Price Rs./Unit	9.00

Solution

<p align="center">Cost Sheet of Product A Month : October,2007</p>					
Total Output :		50,000 Units			
Total Sales :		50,000 Units			
Sl.No.	Particulars	Quantity	Rate Rs/Unit	Total Cost-INR	Cost Rs/unit
	<u>Material Cost</u>				
	Opening Stock			7,500	
	Add : Purchase of raw material			82,500	
	Total			90,000	
	Less : Closing Stock			-	
	Net raw material consumption			90,000	1.80
	Direct Wages			37,500	0.75
	Direct Expenses			15,000	0.30
I	PRIME COST			142,500	2.85
	<u>Factory overheads</u>				
	Earth Mover's rent			3,500	0.07
	Workshop expenses			4,500	0.09
	Godown rent			3,000	0.06
	Factory Insurance			4,500	0.09
	Diesel for D.G.sets			7,500	0.15
	Plant repairs			3,000	0.06
	Factory Building repairs			7,500	0.15
	Factory Manager's salary			7,500	0.15
	Total Factory overheads :			41,000	0.82
II	Manufacturing Cost/ Factory Cost			183,500	3.67
	Administration overheads :	30% of Factory Cost		55,050	1.10
	Total Admn.overheads :			238,550	4.77
III	Cost of Production (COP)			422,050	8.44
	Cost of Production of Quantity Sold			422,050	8.44
	<u>Selling & Distribution overheads</u>				
	Sales Commission			10,000	0.20
	Sales Staff Salary			30,000	0.60
	Advertisement expenses	0.10% of COP		42,205	0.84
	Total S & D overheads.			82,205	1.64
IV	Cost of Sales			504,255	10.09
	Sales Realisation			450,000	9.00
	Costing Profit / (Loss) on Sale			(54,255)	(1.09)

III

OPERATING COST

Prob-01 From the following information, calculate total kms and total Passenger Kms.

No of Buses	5
Days operated in the month	25
Trips made by each bus	4
Distance of route (one side)	20 kms
Capacity of Bus	50 passengers
Normal passenger travelling	90% of capacity

Solution

Total Kms calculated

No of buses x No of days x No of trips x Distance of a trip = Total kms travelled.

$$5 \times 25 \times 4 \times 20 \times 2 = 20,000 \text{ kms.}$$

Passenger Kms calculated

No of buses x No of days x No of trips x Distance of a trip x Capacity x Normal passengers travelling

= Total passengers kms travelled.

$$5 \times 25 \times 4 \times 20 \times 2 \times 50 \times 90\% = 900,000 \text{ passenger kms.}$$

Prob-02 From the following data relating to a vehicles A , compute the cost per running kilometer.

<u>Particulars</u>	<u>Cost data-Annual</u>
Cost of vehicle-Rs	350,000
Kilometers run	15,000
<u>Cost data in Rupees</u>	
Road Licence	1,500
Insurance	5,000
Garage Rent	12,000
Supervision and salaries	12,000
<u>Other cost data</u>	
Driver wages Rs. per hour	15
Vehicle run per day in hours	10
Vehicle run per day in Kms.	300
Cost of diesel per Ltr.	35
Kilometers run per Litre of diesel	14
Repairs & Mnt per Rs/ Km	0.10
Tyre allocation Rs./ Km	0.16
Estimated life of the vehicle-Kms.	300,000
Charge interest on cost of vehicle	@ 10% p.a.

Solution

<u>Statement of Operating Cost of Vehicle - A</u>			
	<u>Items of cost</u>	<u>Total Cost (INR)</u>	<u>Cost Rs/km</u>
	Road Licence	1,500	0.10
	Insurance	5,000	0.33
	Garage Rent	12,000	0.80
	Supervision and salaries	12,000	0.80
	Interest on cost of vehicle	35,000	2.33
	Total Fixed Expenses	65,500	4.37
	<u>Vehicle Running expenses</u>		
	Driver wages	$(15 \times 10) / 300$	0.50
	Cost of diesel	$(300 / 14 \times 35) / 300$	2.50
	Repairs & Mnt		0.10
	Tyre allocation		0.16
	Depreciation	$3,50,000 / 3,00,000$	1.17
	Operating expenses		4.43
	Total Cost of vehicle running		8.79

Prob-03. From the following information relating to Seaview Hotel, calculate the room rent to be charged to give a profit of 30 % on cost:

- | Particulars | Cost p.a.(INR) |
|---|----------------|
| 01 Salaries to staff Rs. 6,00,000 p.a. | |
| 02 Wages of the room attendant : Rs.40 per day. There is a room attendant for each room. He is paid wages only when the room is occupied. | |
| 03 Lighting, colling and power (a) The normal lighting expenses for a room for the whole month is Rs.200 when occupied. (b) Power is used only in summer and charges are Rs.300 p.m.for a room, when occupied. | |
| 04 Repairs to building : Rs.90,000 p.a. | |
| 05 Licence, taxes etc. Rs.42,000 p.a | |
| 06 Miscellaneous expenses ; Rs.1,20,000 p.a. | |
| 07 Interior decoration and furnishing Rs.1,00,000 p.a. | |
| 08 Depreciation @5% p.a. is to be charged on building costing Rs.40,00,000/- and 10% p.a. on equipments. | |
| 09 Interest is to be charged @10% on investment in buildings and equipments amounting Rs.50,00,000/- | |
| 10 There are 100 rooms in a hotel, 80% of the rooms are generally occupied in summer and 30% in winter.
The period of summer and winter may be taken 6 months in each case. A month may be taken as 30 days. | |

Solution

Seaview Hotel - Operating Cost Statement For the year ended 31st March 2007		
Sl.No.	Items	Cost p.a.(INR'000)
01	Staff salaries	600,000
02	Room atendants' wages (note 2)	792,000
03	Lighting, cooling and power (note 3)	276,000
04	Repairs to building	90,000
05	Licence, taxes etc.	42,000
06	Miscellaneous expenses	120,000
07	Interior decoration and furnishing	100,000
08	Depreciation on	
09	Building @ 5% of Rs.40,00,000/-	200,000
10	Equipment @ 10% of Rs.10,00,000/-	100,000
11	Interest on investment @10% on Rs.50,00,000/-	500,000
	Total Cost	2,820,000
12	Profit @30% on total cost .	846,000
13	Total Rent to be charged for all rooms	3,666,000
14	Room days (note 1)	19,800
15	Room rent to be charged per day	185

Notes

		Amount(INR)
01.	<u>Room days</u>	
	Summer	$100 \times 80\% \times 6 \times 30 = 14,400$
	Winter	$100 \times 30\% \times 6 \times 30 = 5,400$
		19,800
02.	<u>Room attendants' wages</u>	
	Summer	$14,400 \times 40 = 576,000$
	Winter	$5,400 \times 40 = 216,000$
		792,000
03.	<u>Lighting, cooling and power</u>	
	<u>Lighting :</u>	
	Summer	$100 \times 80\% \times 6 \times 200 = 96,000$
	Winter	$100 \times 30\% \times 6 \times 200 = 36,000$
		132,000
	<u>Cooling and Power</u>	
Summer	$100 \times 80\% \times 6 \times 300 = 144,000$	
		276,000

BUDGETING

PROB.-01

The West Bengal Jute Co-operative Society Ltd. furnishes following data for the year ended 31st December, 2007 and expects you to prepare a Budget for the year 2008.			
Production	Unit of Measurement	West Bengal	
Production related data			
Jute Production (84,65,000 bales of 180 kg each)	'000 Tonnes	1,524	
Jute Production-Quintals	'000 Quintals	15,237	
Area	'000 Hectares	630	
Yield = Prodn.(Tonnes) Per Hectare		2.42	
Yield = Prodn.(Quintals) Per Hectare		24.18	
Cost related data	Unit	West Bengal	
<u>Input consumption/Hectare</u>		<u>Qty</u>	<u>Rate</u>
Seed	Quintals	7.83	35.97
Fertilisers	Kgs of Nutrients	86.46	13.85
Manure	Quintals	4.84	37.23
Insecticides	Kgs	6.00	38.02
Human labour			
Casual	Manhours	924	7.48
Attached	Manhours	4	7.48
Family members	Manhours	806	7.48
Total Human labour	Manhours	1,734	7.48
Animal labour	Pair hours	133	11.17
<u>Other Cost data/Hectare</u>			<u>Cost(INR)</u>
Machine labour			265
Irrigation charges			885
Interest on working capital			358
Rental value of owned land			4,873
Rent paid for leased-in rent			31
Land revenue, cesses & taxes			18
Depreciation on implements			260
Interest on fixed capital			604
Society expenses share			8
<u>While preparing the budget, following points need consideration :</u>			
01. Area of cultivation is to increase by 10%.			
02. Yield will improve by 5%.			
03. Fertilisers price to go up by 2%.			
04. Seed consumption to go down by 2%.			
05. Manure price to go down by 5%.			
06. Labour rate to increase by 2%.			
07. Improvement in Sale value of the product by 5%.			

Particulars	Unit	STATEMENT OF ACTUAL PERFORMANCE AND BUDGETED PERFORMANCE														
		ACTUAL COST OF JUTE PRODUCTION-2007					BUDGETED COST OF JUTE PRODUCTION-2008									
		Qty	Rate	INR/Hectare	Cost	INR/Quintal	Qty	Rate	INR/Hectare	Cost	INR/Quintal					
Area - Hectares	Quintals/He	630														
Jute Production		24.18				693				25.39						
Direct Material																
Seed	Quintals	7.83	35.97	282	11.65	7.67	35.97	276	10.87							
Fertilisers	Kgs of Nutrients	86.46	13.85	1,197	49.52	86.46	14.13	1,221	48.10							
Manure	Quintals	4.84	37.23	180	7.45	4.84	35.37	171	6.74							
Insecticides	Kgs	6.00	38.02	228	9.43	6.00	38.02	228	8.98							
Total RM Cost				1,867	78.05			1,897	74.70							
Direct Labour																
Human labour		928	7.48	6,941	287.05	928	7.63	7,080	278.85							
Outside labour		806	7.48	6,029	249.31	806	7.63	6,149	242.19							
Family labour (Opportunity Cost)																
Total human labour		1,734	7.48	12,970	536.37	1,734	7.63	13,230	521.04							
Animal labour	Pair hours	133	11.17	1,490	61.62	133	11.17	1,490	58.89							
Machine labour	Direct			265	10.85			265	10.43							
Total Labour Cost				14,725	608.94			14,985	590.16							
Direct Expenses																
Irrigation charges				885	36.62			885	34.87							
Total Direct Expense Cost				885	36.62			885	36.62							
PRIME COST				17,498	723.60			17,767	701.47							
Interest on working capital				358	14.82			358	14.11							
EX - FARM COST				17,856	738.42			18,125	715.59							
Rental value of owned land				4,873	201.53			4,641	182.79							
Rent paid for leased-in rent				31	1.29			30	1.17							
Land revenue, cesses & taxes				18	0.74			17	0.67							
Depreciation on implements				260	10.75			248	9.75							
Interest on fixed capital				604	24.96			575	22.64							
Co-Op Soci.'s expenses				8	0.33			8	0.30							
Farmers managerial functions cost (Opportunity Cost)				@10% of total cost				2,364	97.77							
Total Administration overheads				2,365	97.80			2,364	97.77							
COST OF PRODUCTION				8,159	337.41			7,882	315.10							
SALES REALISATION				26,016	1,075.83			26,008	1,030.69							
Value of Main Product				17,300	715.41			19,073	751.18							
Value of by-product				2,344	96.93			2,584	101.78							
Total Value				19,644	812.34			21,658	852.96							
Difference				(6,372)	(263.49)			(4,350)	(179.89)							

Sales realisation has increased on two folds.

Productivity by 5% will give more realisation per hectare.

Rate increase by 5% on improved yield will give further more realisation per hectare.

Fixed cost absorption

Impact of increase in productivity is shown by getting reduced per hectare cost.

IV

BUDGETING

Prob-02. From the following information relating to 2006, prepare a BUDGET for the year 2007.

<u>Actual performance-2006</u>	<u>Units</u>	<u>Value(INR)</u>
Sales	40,000	100,000
Raw Materials		53,000
Wages		11,000
Variable overheads		16,000
Fixed overheads		10,000
<u>Expected performance-2007</u>		
Sales	60,000	150,000
Raw Materials		5% increase
Wages		10% increase in wage rate
		5% increase in productivity
 Additional Plant		One Lathe Rs.60,000/- One Drill m/c Rs.24,000/-

Solution

<u>BUDGET for the year 2007</u>							
Sl.No.	Particulars	Actual -2006			Budget-2007		
		Quantity	Cost/unit	Value (INR)	Quantity	Cost/unit	Value
01.	<u>Sales</u>	40,000	2.50	100,000	60,000	2.50	150,000
	<u>Cost</u>						
	Raw Materials		1.33	53,000		1.39	83,475
	Wages		0.28	11,000		0.29	17,286
	Variable overheads		0.40	16,000		0.40	24,000
	Total Variable Cost		2.00	80,000		2.08	124,761
	Fixed overheads		0.25	10,000		0.31	18,400
	Total Cost		2.25	90,000		2.39	143,161
	Operating Profit		0.25	10,000		0.11	6,839
<p>Note : Fixed overheads of Rs.10,000 are increased due to depreciation of Rs.8,400/- on additional equipments.</p>							

Prob-03. Prepare a Flexible Budget for production at 80% and 100% activity on the basis of the following information :

Production at 50% capacity	5000 Units
	<u>Rs./Unit</u>
Raw materials	80
Direct Labour	50
Expenses	15
Factory Expenses	50,000 50% Fixed.
Administration expenses	60,000 60% variable.

Solution

BUDGET for the year 2007					
Sl.No.	Particulars	Cost - Rs/Unit	Cost at different Capacity levels		
			50%	80%	100%
	<u>Production - Units</u>		<u>5000</u>	<u>8000</u>	<u>10000</u>
	<u>Cost data</u>				
	Raw materials	80	400,000	640,000	800,000
	Direct labour	50	250,000	400,000	500,000
	Expenses	15	75,000	120,000	150,000
	Factory expenses (50% variable)		25,000	40,000	50,000
	Administration expenses (60% variable)		36,000	57,600	72,000
	Total variable cost		786,000	1,257,600	1,572,000
	Factory expenses (50% Fixed)		25,000	25,000	25,000
	Administration expenses (40% Fixed)		24,000	24,000	24,000
	Total Fixed cost		49,000	49,000	49,000
	Total Cost		835,000	1,306,600	1,621,000

FORMULAE

MARGINAL COSTING

Contribution = Revenue - Variable cost

Break Even Point = Fixed Cost / Contribution per unit

Margin of Safety = Total Revenue or Total sale qty - Sale qty at BEP.

Excess of Income = Contribution - Fixed Cost
Or, = Total Revenue - Total Cost

Standard Costing and Variance Analysis

Material

Material Price Variance = (Std Price - Actual Price) x Actual Quantity

Material Usage Variance = (Std Qty - Act Qty) x Std Price

Material Cost Variance = Total Std Cost - Total Actual Cost

Or, Material Price Variance + Material Usage Variance

Labour

Labour Price Variance = (Std Price - Actual Price) x Actual Quantity

Labour Efficiency Variance = (Std Qty - Act Qty) x Std Price

Labour Cost Variance = Total Std Cost - Total Actual Cost

Total Cost Variance = Material Cost Variance + Labour Cost Variance

MARGINAL COSTING

PROB.-01 From the Actual & Budgeted performance in Prob-02, work out :

01. Contribution;
02. PV Ratio;
03. Break-Even Point; and
04. Margin of Safety.

SOLUTION-01

	<u>Cost Structure :</u>	<u>Actual Perform.</u> All values in INR/ Hectare.	<u>Budgeted Per.</u> All values in INR/ Hectare
	Sale Realisation	19,644	21,658
	<u>Variable Cost</u>		
	Material	1,887	1,897
	Labour	14,725	14,985
	Expenses	1,244	1,244
	Total Variable Cost	17,856	18,125
3(01)	Contribution	1,788	3,532
3(02)	P/V Ratio	9.10%	16.31%
	<u>Working for Break-Even Point</u>		
	Fixed Cost	8,159	7,882
	Area -Hectares	630	693
	Total Fixed Cost	5,141,048	5,141,048
3(03)	<u>Break-Even Point in Sale Value</u> Fixed Cost/P/V Ratio =	56,497,983 INR	31,521,124 INR
	<u>Break-Even Point in Sale Qty</u> Fixed Cost/ Contribution/Unit =	2,876 Hectares	1,455 Hectares
3(04)	<u>Margin of Safety</u> Total Sales - Sale at BEP = 630 Hec - 2,876 =	(2,246) Negative. No margin of safety available.	(762) Negative. No margin of safety available.

V**MARGINAL COSTING**

Prob-02. A company supplies you the following data :

Selling price	Rs/Unit	25
Fixed cost	Rs.	500,000
Variable cost	Rs/Unit	15

Calculate the Break Even Point in units and BEP in Sale value.

Solution

<u>Break-even point (BEP)</u>	<u>Rs./ Unit</u>
Selling price	25
Less : Variable cost	15
Contribution	<u>10</u>

BEP = Fixed cost / contribution per unit	5,00,000/10
BEP Units	50,000
BEP Sales	1,250,000

Prob-03 M/s S.Jamsons & Co. has budgeted a production of 500 units at a variable cost of Rs.20 each. The Fixed cost are Rs.2000. The Selling Price is fixed to yield 25% profit on cost. You are required to show Break Even Chart and to calculate :

P/V Ratio.
Break-Even Point.
Margin of Safety.

Solution

	<u>Total Cost</u>	<u>Cost/unit</u>
<u>Units to be produced</u>	500	
Variable cost	10,000	20
Fixed cost	2,000	4
Total Cost	<u>12,000</u>	<u>24</u>
Profit @25% on cost	3,000	6
Sale Value	15,000	30

<u>Break-even point (BEP)</u>	<u>Total Cost</u>	<u>Rs./ Unit</u>
Sales	15,000	30
Less : Variable cost	10,000	20
Contribution	<u>5,000</u>	<u>10</u>

P/V Ratio = Contribution / Sale value $5,000/15,000 \times 100 = 33.33\%$

BEP = Fixed cost / contribution per	2,000/10
BEP Units	200
BEP Sales	6,000

Margin of Safety = Total Sales - Sales at 15,000 - 6000 = 9,000

Prob-04. From the following data, draw a break-even chart and find out the break-even point:

	<u>Rs.</u>
Fixed expenses	20,000
Selling price per unit	25
Variable cost per unit	20

Find out the selling price per unit, if the break-even point is brought down to 2000 units.

Solution

	<u>Rs./Unit</u>	<u>%</u>
Selling price	25	
Less : Variable cost	20	80%
Contribution	<u>5</u>	

BEP 4,000 Units

Revised BEP

Selling price if BEP is brought down to 2000 Units

Variable cost	2000 x 20 =	40,000
Fixed cost		20,000
Total Cost = Total Sale value at BEP		<u>60,000</u>

Sale price (Rs./Unit) = $60,000/2000 =$ 30

Prob-05. The following data are obtained from the records of a factory :

	<u>Rs.</u>	<u>Rs.</u>
Sales 4,000 units @ Rs.25 each		100,000
Material consumed	40,000	
Labour charges	20,000	
Variable overheads	12,000	
Fixed overheads	18,000	

It is proposed to reduce the selling price by 20%, what extra units should be sold to obtain the same amount of profit as above ?

Solutions

Existing profit

	Amount (INR)	Rs/Unit	Revised Rs/Unit
Sales 4,000 units @ Rs.25 each	100,000	25	20
Material consumed	40,000	10	10
Labour charges	20,000	5	5
Variable overheads	12,000	3	3
Total Variable cost	<u>72,000</u>	<u>18</u>	<u>18</u>
Contribution	<u>28,000</u>	<u>7</u>	<u>2</u>
Fixed overheads	18,000		
Profit	10,000		

Required contribution =

Fixed Cost	18,000
Profit	10,000
Total	28,000 @ Rs.2/unit

Required Sales quantity = Required contri/contributic 14000 Units

Total Units of sale required	14,000
Existing units of sale	4,000
Extra units to be sold.	<u>10,000</u>

Prob-06.

A factory produces two products, A and B the cost of production and gross profit in respect of each for August 19X7 are given below. Comment on the profitability of the products and state which product will give more profit during heavy demand.

	Product A	Product B
Units produced	400	100
	<u>Rs./Unit</u>	<u>Rs./Unit</u>
Direct material cost	100	350
Direct wages	200	100
Variable overhead	100	50
Fixed overhead	400	200
Cost of production	800	700
Gross profit	200	300
Sales price	1000	1000

Solution

From the data presented under absorption costing, one may apparently conclude that B is more profitable as the gross profit of B is higher than that of A.

The above conclusion is faulty and let us present the data under marginal costing as follows:

	Product A	Product A
	<u>Rs. Per unit</u>	<u>Rs. Per unit</u>
Sales	1000	1000
Less: Marginal cost -		
Direct material cost	100	350
Direct wages	200	100
Variable cost	100	50
Contribution per unit	<u>600</u>	<u>500</u>

Contribution per unit and P/V ratio of A is higher than that of B and so, in case of heavy demand, A is more profitable than B.

Prob.07 Two businesses X Ltd. And Y Ltd. Manufacture and sell the same type of product in the same type of market. The budgeted profit and loss accounts for the coming year are -

	X Ltd.		Y Ltd	
	Rs.	Rs.	Rs.	Rs.
Sales		30000		30000
Less: Variable cost	24000		20000	
Fixed cost	<u>3000</u>		<u>7000</u>	
		<u>27000</u>		<u>27000</u>
Estimated profit		<u>3000</u>		<u>3000</u>

You are required to —

- Calculate the break-even points and margin of safety of each business;
- State which business is likely to earn greater profits in conditions of:
 - heavy demand for the product,
 - low demand for the product; and
- Calculate the percentage increase in sales in both cases to absorb a 50% increase in fixed overhead in each case.

Solution:

(a)	Marginal cost statement	
	X Ltd	Y Ltd
Sales	30000	30000
Less: Marginal costs	<u>24000</u>	<u>20000</u>
Contribution	<u>6000</u>	<u>10000</u>
P/V ratio (or c/s ratio)	1/5 or 20%	1/3 or 33.33%
	3000/20%	7000/33.33%=
BEP	=Rs.15000	Rs.21000
Margin of safety	3000/20%= Rs.15000	3000/33.33%= Rs.9000

(b) (i) In case of heavy demand, Y Ltd. Will earn more profit as P/V ratio of Y Ltd. is higher than that of X Ltd.

(ii) In case of low demand, X Ltd. Is preferable as fixed cost as well as break-even point is low in case of X Ltd. And consequently margin of safety of X

(c) The contribution required to earn the same quantum of profit when fixed overheads increase by 50% in each case is given by -

	X Ltd	Y Ltd.
	Rs.	Rs.
Net profit	3000	3000
Fixed cost	4500	10500
Contribution	<u>7500</u>	<u>13500</u>
Sales to earn above contribution	7500/20%	13,500/33.33%
	=Rs.37,500	= Rs. 40,500
Percentage increase in sales	25%	35%

Prob.08 The following information is obtained from A Co. Ltd. in a certain year -----

	Rs.
Sales	100000
Variable cost	60000
Fixed cost	30000

- (a) Find the P/V Ratio, break-even point and margin of safety at this level.
 (b) Calculate the effect of --
- (i) 20% increase in selling price;
 - (ii) 10% decrease in selling price
 - (iii) 5% decrease in sales volume;
 - (iv) 10% decrease in fixed costs;
 - (v) 10% decrease in variable costs;
 - (vi) 20% increase in selling price accompanied by increase in fixed overhead by Rs. 10,000;
 - (vii) 20% increase in selling price, 10% increase in fixed cost and 10% decrease in variable costs.

Solution:

	P/V ratio (or, c/s ratio)	Break-even sales (F/p/v ratio)	Margin of safety (P/P/v ratio)
(a) Existing position:	$\frac{40000}{1,00,000} = 40\%$	$\frac{30,000}{40\%} = \text{Rs. } 75,000$	$\frac{10,000}{40\%} = \text{Rs. } 25,000$
(b)			
(i) 20% increase in selling price:	$\frac{60,000}{1,20,000} = 50\%$	$\frac{30,000}{50\%} = \text{Rs. } 60,000$	$\frac{10000}{50\%} = \text{Rs. } 60,000$
(ii) 10% decrease in selling price:	$\frac{30,000}{90,000} = 33.33\%$	$\frac{30,000}{33.33\%} = \text{Rs. } 90,000$	$\frac{0}{33.33\%} = 0$
(iii) 5% decrease in sales volume (i.e. 5% decrease in level of activity):	$\frac{38,000}{95,000} = 40\%$	$\frac{30,000}{40\%} = \text{Rs. } 75,000$	$\frac{8,000}{40\%} = \text{Rs. } 20,000$
(iv) 10% decrease in fixed cost:	$\frac{40,000}{1,00,000} = 40\%$	$\frac{27,000}{40\%} = \text{Rs. } 67,500$	$\frac{13,000}{40\%} = \text{Rs. } 32,500$
(v) 10% decrease in variable cost:	$\frac{46,000}{1,00,000} = 46\%$	$\frac{30,000}{46\%} = \text{Rs. } 65,217$	$\frac{16,000}{46\%} = \text{Rs. } 34,783$
(vi) 20% increase in selling price and increase in fixed overhead by Rs.10,000:	$\frac{60,000}{1,20,000} = 50\%$	$\frac{40,000}{50\%} = \text{Rs. } 80,000$	$\frac{20,000}{50\%} = \text{Rs. } 40,000$
(vii) 20% increase in sales price, 10% increase in fixed cost, and 10% decrease in variable cost :	$\frac{66,000}{1,20,000} = 55\%$	$\frac{33,000}{55\%} = \text{Rs. } 60,000$	$\frac{33,000}{55\%} = \text{Rs. } 60,000$

OBJECTIVE TYPE TRUE/FALSE

State Whether the following statements are <i>True/ False</i> by Writing <i>T/F</i> in the remark column.		
		Remark
a.	An increase in volume of production will result in a reduction in unit variable cost.	
b.	Marginal cost includes prime cost plus fixed overheads.	
c.	contribution is the difference between the selling price and variable cost.	
d.	The difference between the budgeted output and the actual output is known as "margin of safety".	
e.	All variable costs are included in marginal cost.	
f.	When fixed cost is deducted from total cost, we get marginal cost.	
g.	By reducing the fixed expenses, the P/V ratio of a particular product can be improved.	
h.	Break-even point is not affected by changes in fixed cost.	
i.	Margin of safety is the difference between actual sales and the sales at break-even point.	

OBJECTIVE TYPE FILL IN THE BLANKS

Fill in the blanks for following incomplete sentences :	
a.	In cost accounting, marginal cost does not include _____.
b.	Sales minus variable cost = Fixed Cost plus _____.
c.	Contribution minus _____ cost is profit.
d.	At break-even point _____ is equal to fixed cost.

Answers for True/False

(a) F (b) F (c) T (d) F (e) T (f) T (g) F (h) T (i) T

Answers for blanks

- a. Fixed Cost
- b. Profit
- c. Fixed
- d. Contribution

OBJECTIVE TYPE MULTIPLE CHOICE QUESTIONS

TICK BELOW	Select the correct answer in each of the following by Ticking it.
a.	<u>The Selling price per unit Rs.20, variable cost Rs.12/unit and fixed cost Rs.16,000;</u> <u>The Break-even production in units-----</u>
1	800
2	2000
3	3000
b.	<u>Sales Rs.20,000, variable cost Rs.12,000 and fixed cost Rs.4,000, the break-even sales is---</u>
1	Rs.12000
2	Rs.10000
3	Rs 1500
c.	<u>Sales Rs.20,000, variable cost Rs.12,000, fixed cost Rs. 4,000, P/V ratio is----</u>
1	80%
2	40%
3	30%
d.	<u>Sales Rs.20,000, variable cost Rs.12,000, Net profit Rs.3,000. Fixed cost is -----</u>
1	Rs.6000
2	Rs.5000
3	Rs.4000
e.	<u>Actual sales Rs.20,000, break-even sales Rs.12,000, margin of safety sales -----</u>
1	Rs. 8000
2	Rs.12000
3	Rs.10000
f.	<u>P/V ratio is 0.6, Marginal cost of production Rs.20. The selling price is---</u>
1	Rs.40
2	Rs.60
3	Rs.50
g.	<u>Fixed cost Rs.5,000, Sales Rs.40,000 and P/V ratio 30%. The amount of profit is -----</u>
1	Rs.7000
2	Rs.9000
3	Rs.12000
h.	<u>The P/V raio of a product is 0.4 and selling price is Rs.40 per unit. The marginal cost of the product would be ----</u>
1	Rs.8
2	Rs.24
3	Rs.20

Answers

(a) 2 (b) 2 (c) 2 (d) 2 (e) 1 (f) 3 (g) 1 (h) 2

STANDARD COSTING AND VARIANCE ANALYSIS

PROB.-01 An Agriculture Co-operative Society was upset with the performance and wanted to know the reasons of increase in losses.
The Standard and Actual data are as under :

	Standard Data for 2007			Actual Data for 2007			Difference
	Qty.	Rate	Cost	Qty.	Rate	Cost	
Material Cost							
Seed	7.00	34.00	238	7.83	35.97	282	(44)
Fertilisers	85.00	13.00	1,105	86.46	13.85	1,197	(92)
Manure	4.00	34.00	136	4.84	37.23	180	(44)
Insecticides	5.00	37.00	185	6.00	38.02	228	(43)
			1,664			1,887	(223)
Labour Cost							
Outside Labour	850	7.18	6,103	928	7.48	6,941	(838)
Family Labour	750	7.18	5,385	806	7.48	6,029	(644)
			11,488			12,970	(1,482)
Total Cost			13,152			14,858	(1,706)
Find out variances							

SOLUTION-01

MATERIAL COST VARIANCES

Material Usage variance = (SQ - AQ) x SP

Seed	(7 - 7.83) x 34/- =	(28) A
Fertilisers	(85 - 86.46) x 13/- =	(19) A
Manure	(4 - 4.84) x 34/- =	(29) A
Insecticides	(5 - 6) x 37/- =	(37) A
		(113) A

Material Price variance = (SP - AP) x AQ

Seed	(34 - 35.97) x 7 =	(15) A
Fertilisers	(13 - 13.85) x 86.46 =	(73) A
Manure	(34 - 37.23) x 4.84 =	(16) A
Insecticides	(37 - 38.02) x 6 =	(6) A
		(111) A

Material Cost Variance = MUV + MPV

Seed		(44) A
Fertilisers		(92) A
Manure		(44) A
Insecticides		(43) A
		(223) A

LABOUR COST VARIANCES

Labour Efficiency Variance = (SQ - AQ) x SR

Outside Labour	(850 - 928) x 7.18 =	(560) A
Family Labour	(750 - 806) x 7.18 =	(402) A
		(962) A

Labour Rate Variance = (SR - AR) x AQ

Outside Labour	(7.18 - 7.48) x 928 =	(278) A
Family Labour	(7.18 - 7.48) x 806 =	(242) A
		(520) A

Labour Cost Variance = LEV + LRV

LEV + LRV		(838) A
LEV + LRV		(644) A
		(1,482) A

TOTAL COST VARIANCE

Total Cost Variance = Material Cost Variance + Labour Cost Variance

or, (223) + (1482) = (1,706) A

Prob-04 The Standard quantity and standard price of raw material required for one unit of product A are given as follows : Calculate variances.

Particulars	Quantity	Rate Rs/kg
Material X	2 kg	3.00
Material Y	4 kg	2.00

The Actual production and relevant data are as follows :

Output Units	Total Quantity	Total Cost Rs
	500	
Material X	1,100	3,410
Material Y	1,800	3,960

Solution

Standard Particulars	Qty.kg/unit	Rate Rs/kg	Total Cost-Rs
Material X	2	3.00	3,000
Material Y	4	2.00	4,000
			<u>7,000</u>

The Actual production and relevant data are as follows :

Output Units	Total Quantity	Qty.kg/unit	Rate Rs/kg	Total Cost Rs
	500			
Material X	1,100	2.2	3.10	3,410
Material Y	1,800	3.6	2.20	3,960
				<u>7,370</u>
Difference in total cost				<u><u>(370) A</u></u>

Material	Material Usage variance	
X	$(2 - 2.2) \times 3/- =$	(300.00)
Y	$(4 - 3.6) \times 2/- =$	400.00
		<u>100.00 F</u>

	Material Price variance	
X	$(3 - 3.10) \times 2.20 \text{ kg} =$	(110.00)
Y	$(2 - 2.2) \times 3.60 \text{ kg} =$	(360.00)
		<u>(470.00) A</u>

	Material Cost Variance	
X	MUV + MPV =	(410.00)
Y	MUV + MPV =	40.00
		<u>(370.00) A</u>

Prob-05. The standard and actual data for the product A is given as under. Calculate (i) Labour cost variance (ii) Labour Rate variance (iii) Labour Efficiency variance.

Standard 40 hours @ Rs.20 per hour.
Actual 45 hours @ Rs.22 per hour.

Solution

	<u>Total Cost Rs.</u>
Standard 40 hours @ Rs.20 per hc	800
Actual 45 hours @ Rs.22 per hour.	990
Total Labour cost variance	-190 A

Labour Efficiency Variance
(40 -45) x 20/- = (100) A

Labour Rate Variance
(20 - 22) x 45 hrs = (90) A

Labour Cost Variance
LEV + LRV (190) A

Prob-06. Calculate from following (i) Labour Cost variance (ii) Labour Efficiency variance (iii) Labour Rate variance.

<u>Standard Data</u>	<u>Standard Hours</u>	<u>Rate Rs/Hour</u>	<u>Total Rs.</u>
Workman A	20	30	600
Workman B	25	40	1000
			<u>1600</u>
<u>Actual Data</u>	<u>Actual Hours</u>	<u>Rate Rs/Hour</u>	<u>Total Rs.</u>
Workman A	30	30	900
Workman B	15	45	675
			<u>1575</u>
Labour Cost Variance			25

F

Solution

Workman

	<u>Labour Efficiency Variance</u>		
A	(20 -30) x 30/- =	(300)	
B	(25 -15) x 40/- =	400	
		<u>100</u>	F
	<u>Labour Rate Variance</u>		
A	(30 - 30) x 30 hrs =	-	
B	(40 - 45) x 15 hrs =	(75)	
		<u>(75)</u>	A
	<u>Labour Cost Variance</u>		
A	LEV + LRV	(300)	
B	LEV + LRV	325	
	Total	25	F

concluded.