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Content

Group II Paper 4: Cost Accounting & Financial Management

(One paper – Three hours — 100 Marks)

Level of Knowledge: Working knowledge

Part I: Cost Accounting (50 Marks) & Part II: Financial Management (50 Marks)

Objectives for Cost Accounting :

(a) To understand the basic concepts and processes used to determine product costs,
(b) To be able to interpret cost accounting statements,
(c) To be able to analyse and evaluate information for cost ascertainment, planning, control and decision making, and
(d) To be able to solve simple cases.

Contents:

1. Introduction to Cost Accounting

(a) Objectives and scope of Cost Accounting
(b) Cost centres and Cost units
(c) Cost classification for stock valuation, Profit measurement, Decision making and control
(d) Coding systems
(e) Elements of Cost
(f) Cost behaviour pattern, Separating the components of semi-variable costs
(g) Installation of a Costing system
(h) Relationship of Cost Accounting, Financial Accounting, Management Accounting and Financial Management.

2. Cost Ascertainment

(a) Material Cost

(i) Procurement procedures— Store procedures and documentation in respect of receipts and issue of stock, Stock verification
(ii) Inventory control —Techniques of fixing of minimum, maximum and reorder levels, Economic Order Quantity, ABC classification; Stocktaking and perpetual inventory
(iii) Inventory accounting
(iv) Consumption — Identification with products of cost centres, Basis for consumption entries in financial accounts, Monitoring consumption.

(b) Employee Cost

(i) Attendance and payroll procedures, Overview of statutory requirements, Overtime, Idle time and Incentives
(ii) Labour turnover
(iii) Utilisation of labour, Direct and indirect labour, Charging of labour cost, Identifying labour hours with work orders or batches or capital jobs
(iv) Efficiency rating procedures
(v) Remuneration systems and incentive schemes.

(c) Direct Expenses

Sub-contracting — Control on material movements, Identification with the main product or service.

(d) Overheads

(i) Functional analysis—Factory, Administration, Selling, Distribution, Research and Development
Behavioural analysis—Fixed, Variable, Semi variable and Step cost.

(ii) Factory Overheads—Primary distribution and secondary distribution, Criteria for choosing suitable basis for allotment, Capacity cost adjustments, Fixed absorption rates for absorbing overheads to products or services

(iii) Administration overheads—Method of allocation to cost centres or products

(iv) Selling and distribution overheads—Analysis and absorption of the expenses in products/customers, impact of marketing strategies, Cost effectiveness of various methods of sales promotion.

3. Cost Book-keeping

Cost Ledgers—Non-integrated accounts, Integrated accounts, Reconciliation of cost and financial accounts.

4. Costing Systems

(a) Job Costing

Job cost cards and databases, Collecting direct costs of each job, Attributing overhead costs to jobs, Applications of job costing.

(b) Batch Costing

(c) Contract Costing

Progress payments, Retention money, Escalation clause, Contract accounts, Accounting for material, Accounting for plant used in a contract, Contract profit and Balance sheet entries.

(d) Process Costing

Double entry book keeping, Process loss, Abnormal gains and losses, Equivalent units, Inter process profit, Joint products and by products.

(e) Operating Costing System

5. Introduction to Marginal Costing

Marginal costing compared with absorption costing, Contribution, Breakeven analysis and profit volume graph.

6. Introduction to Standard Costing

Various types of standards, Setting of standards, Basic concepts of material and Labour standards and variance analysis.

Some important instruction

Basic Strategy of Success in Examination

1. **Maintain separate copies (Rule sheet) for class note & home work.**
2. **All pages should be numbered.**

3. **Mention the corresponding copy and page no. at the side of each problem. This is very important for cross reference and it helps to reduce your revision time, mainly before the examination. Maintain content in each copy.**

4. **Our main objective in the examination is to score 65%+, because the end of the day every one will ask how much u score, not how much u answer. So, our simple strategy is to answer 80+ with good quality, so that the score is automatically 65+. Many students score 72, 73 by answering 80 or 85 out of 100 marks paper.**

As we write only 80 or 85 marks in 3 hours, automatically

a. **Available time to answer per question will increase**
b. **Reduces no. of mistakes, which a student normally does to attempt of 100 marks within the same time.**
c. **Increase quality of answer.**
d. **Help to avoid the hardest question in the paper**

So, getting 70 marks by answering 80 is not an impossible task but need a good strategy.

Pre-conditions of quality answers are:

1) Proper heading for each statement & working note.
2) Write units and notation with every calculation, particularly Rs. and Rs. per unit.

3) Supporting notes with each answer.
4) Simple quality English.

5) Always starts the answer with the definition of the subject. Don't starts the answer like " It is a very important concept of cost Accounting." It is important that is why it given in examination. Such answer creates impression that the student is answering for volume not by quality.

6) Always starts the answer in a fresh page, preferable at the left hand side of page while answering the problem.

7) Do not use any color in our answer.

8) Do not underline the key or catch word of each sentence. Mention proper question no. in each answer.

9) A good hand writing is a must for a "quality answer".

10) Use pencil in exam. to prepare graph & chart

It is important to Remember:

1 Take part in class discussion .
2 Switch off your Mobile.
3 **Try all Home work**.**
4 Registered in our website: www.costmanagement.net.in
5. Do not talk during discussion, do not talk while I am answering the problems. Such offence following by warning, will lead to 7 class suspension.

**Try all Home work, How?

Step 1: First read the Class note to check the theory
Step 2: Carefully Read the problem at least twice.

Step 3: Now read paragraph wise & collect data, write it . Analyse it, whatever you like. This will help you to overcome the question " how to start the answer"?

Step 4: Analysis according to technique which you fell most appropriate.
Step 5: Give Final answer. It will take at least 40 minutes

Tips for the final revision phase:

As the exam looks closer, consider the following list of techniques and make use of those that work for you:

- Summaries your notes into more concise form, perhaps on index cards that you can carry with you for revision on the way into work.
- Go through your notes with a highlighter pen, marking key concepts and definitions.
- Summaries the main points in a key area by producing a wordlist, mind map or other mnemonic device.
- On areas that you find difficult, rework questions that you have already attempted, and compare your answers in detail with those provided in the study system.
- Rework questions you attempted earlier in your studies with a view to producing more 'polished' answers (better layout and presentation may earn marks in the exam) and to completing them within the time limits.
- Stay alert for practical examples, incidents, situations and events that illustrate the material you are studying. If you can refer in the exam to real-life topical illustrations you will impress the examiner and may earn extra marks.

How to prepare before day of exam

1. Put maximum stress in revising the theory.
2. Do not try to revise all the problem. We have already solve 300 problems and examples, no one can revise it within 6 hours. So check 1 problem per topic.
3. Try to check the technique of each chapter as given by me in your first class note of each topic.
4. For any other problem always contact me, except during the examination day time between 12 noon to 3 PM.

Basic Concepts & Definitions:

1. Define Cost :

Cost is measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services.

2. Cost Classification :

i) Nature of expense : Material, Labour, Expenses
ii) Relation of Cost Centre : Direct & Indirect for Material, Labour, Expenses
iii) Functions / activities : Production, Administration, Research & Development, Selling & Distribution.
iv) Behavior wise : Fixed ,Variable & Semi- variable.
v) Management decision making: Relevant, Opportunity & sunk cost , etc.
vi) Production Process : Batch, Process, Operating, Operation, Contract & Joint
vii) Time period : Historical, Predetermined, Standard & Estimated

3. Responsibility Centre

It is defined as an activity centre of a business organization entrusted with special task. Under modern budgeting & control, financial executives tend to develop responsibility centre for the purpose of control, Responsibility centers can broadly be classified into 3 categories. They are:

(a) Cost Centers; (b) Profit centers; and (c) Investment centers;

4. Cost Center & Cost Units.

Any unit of Cost Accounting selected with a view to accumulating all cost under that unit. The unit may be a product, a service, division, department, section, a group of plant and machinery, a group of employees or a combination of several units. This may also be a budget centre. Cost Centre or Cost Object is the logical sub-unit for collection of cost. The manager of a cost centre is held responsible for control of cost over there.

Cost unit: is a form of measurement of volume of production or service. This unit is generally adopted on the basis of convenience and practice in the industry concerned.

Industry or Product	cost unit basis	Industry or Product	cost unit basis
Automobile	- Number	Cement	- Tonne/ per bag etc.
Chemicals	- Liter, gallon, kg, ton.	Power	- Kilo – watt hour
Steel	- Tonne	Transport	- Passenger Kilometer.

5. Types of cost centers

Cost Centre may be of two types- personal and impersonal cost centers. Personal cost centre consists of person or group of persons. Cost centres which are not personal cost centres are impersonal cost centres.

Again Cost centres may be divided into broad types i.e. Production Cost Centre and service Cost Centres. Production Cost Centre are those which are engaged in production like Machine shop, Welding shop, Assembling shop etc. Service Cost Centre are for rendering service to production cost centre like Power house, Maintenance, Stores Purchase office etc.

6. Profit Centre

A profit centre is any sub-unit of an organisation to which both revenues and costs are assigned, so that the responsibility of sub-unit may measured. In profit centre, both inputs and outputs are capable perform in financial terms and it provides more effective assessment of the managers performance since costs and revenues are measured in monitory terms.

7. Define Cost Accounting

Cost is measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services.

Cost accounting is the application of accounting and costing principles, methods and techniques in the ascertainment of costs and the analysis of savings and/or excess as compared with previous experience or with standards. (According to ICAI)

CIMA defines Cost Accounting as "the establishment of budgets, standard costs and actual costs of operations, processes, activities or products, and the analysis of variances, profitability or the social use of funds."

8. Differential cost:

(Incremental and detrimental costs). It represents the change (increase or decrease) in total cost (variable as well as fixed) due to change in activity level, technology, process or method of production, etc. For example if any change is proposed in the existing level or in the existing method of production, the increase or decrease in total cost or in specific elements of cost as a result of this decision will be known as incremental cost or excremental cost.

9. Imputed costs:

These costs are notional costs which do not involve any cash outlay. Interest on capital, the payment for which is not actually made, is an example of imputed cost. These costs are similar to opportunity costs.

10. Inventoriable costs:

(or product costs). These are the costs which are assigned to the product. For example under marginal costing, variable manufacturing costs and under absorption costing, total manufacturing cost (variable and fixed) constitute Inventoriable or product costs.

11. Conversion Cost :

Costs of converting material input into semi-finished or finished products, i.e. additional direct materials, direct wages, direct expenses and absorbed production overhead.

12. Opportunity cost:

This cost refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action. For example, a firm financing its expansion plan by withdrawing money from its bank deposits. In such a case the loss of interest on the bank deposit is the opportunity cost for carrying out the expansion plan.

13. Out – of – pocket cost:

It is that portion of total cost which involves cash outflow. This cost concept is a short run concept & is used in decisions relating to fixation of selling price in recession, make or buy, etc. Out–of–pocket costs can be avoided or saved if a particular proposal under consideration is not accepted.

14. Shut down costs:

Those costs which continue to be incurred even when a plant is temporarily shut – down, e.g. rent, rates, depreciation, etc. These costs can be eliminated with permanent the closure of the plant. In other words, all fixed costs which cannot be avoided during the temporary closure of a plant will be known as shut down costs.

15. Sunk costs:

Historical costs incurred in the past are known as sunk costs. They play no role in decision making in the current period. For example, in the case of a decision relating to the replacement of a machine, the written down value of the existing machine is a sunk cost & therefore, not considered.

16. Absolute cost:

These costs refer to the cost of any product, process or unit in its totality. When costs are presented in a statement form, various cost components may be shown in absolute amount or as a percentage of total cost or as p.u. cost or all together. Here the costs depicted in absolute amt. may be called absolute costs & are costs on which further analysis and decisions are based.

17. Period costs:

These are the costs which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred. All non–manufacturing costs such as general & administrative expense, selling & distribution expenses are recognized as period costs.

18. Explicit costs:

These costs are also known as out of pocket costs refer to costs involving immediate payment of cash. Salaries, wages postage and telegram, printing and stationery, interest on loan etc. are some examples of explicit costs involving immediate cash payment.

19. Implicit costs:

These costs do not involve any immediate cash payment. They are not recorded in the books of account. They are also known as economic costs.

20. Controllable costs:

These are the costs which can be influenced by the action of a specified member of an undertaking. A business organization is usually divided into a number of responsibility centers & each such centre is headed by an executive. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre.

21. Uncontrollable costs:

Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs. For example, expenditure incurred by, say, the Tool Room is controllable by the foreman in charge of that section but the share of the tool – room expenditure which is apportioned to a machine shop is not to be controlled by the machine shop foreman.

22. Discretionary costs:

it is a fixed cost in relation to a decision. Discretionary cost can be explained with the help of following two important features.

i. They arise from periodic (usually yearly) decisions regarding the maximum outlay to be incurred.

ii. They are not tied to a clear cause and effect relationship between inputs and outputs.

Examples of discretionary costs includes: advertising, public relations, executive-training, teaching -research -health care and management consulting services

23. Objectives of introducing Cost Accounting System

a. Ascertainment of cost
b. Determination of selling price
c. Cost control and cost reduction
d. Ascertainment of profit of each activity
e. Assisting in managerial decision-making

24. Essential factors for designing a Cost Accounting System.

i. A rough understanding of–Organisational structure; manufacturing procedure.
ii. Selection of a suitable costing technique (Standard or actual, marginal or absorption etc.)
iii. Pricing method suitable, for the material, to be issued to production. (FIFO, LIFO & Avg.)
iv. Method suitable for booking labour cost on jobs. (Efficiency plan, Halsey & Rowan etc.)
v. A sound plan should be devised for the collection, allocation, apportionment and absorption of overheads.
vi. Deciding on ways of treating waste, scrap and idle time.
vii. Designing of suitable forms to be used for collecting and dissemination of Cost data/information.

25. Essentials of a good Cost Accounting System

i. The Cost Accounting System should be tailor made, practical, simple and capable of meeting the requirements of a business concern.
ii. The method of costing should be suitable to the industry and serve its objectives.
iii. The Costing System should receive co-operation and participation of executives from various departments.
iv. The cost of installing and operating the system should justify the results.
v. The system of costing should not sacrifice the utility by introducing meticulous and unnecessary details.
vi. The system should consider the organisational structure of the business and it should be designed as a sub-system of the overall organisation.
vii. There should be a harmonious relationship between costing system and financial accounts. Unnecessary duplication should be avoided. A single integrated accounting system would be ideal.

26. Importance of Cost Accounting to Business Concerns

(a) Control of materials cost :
(b) Control of labour cost
(c) Measuring efficiency:
(d) Budgeting:.
(e) Price determination:.
(f) Arriving at decisions

27. Cost Manual

A manual represents procedure of work. A cost manual helps to prepare different cost reports. In general, costing system has the following phases :-

(i) Cost Collection (ii) Cost grouping (iii) Cost Analysis
(iv) Cost apportionment and allocation (v) Cost interpretation.

28. Cost Reports

(i) Cost Sheets
(ii) Consumption of materials statements
(iii) Labour utilisation statements
(iv) Overheads incurred compared with budgets
(v) Sales compared with budgets
(vi) Reconciliation
(vii) Cost of abnormally spoiled work
(viii) The total cost of inventory carried.

29. Estimated cost:

Kohler defines estimated cost as "the expected cost of manufacture, or acquisition often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase". Estimated cost are prospective costs since they refer to prediction of costs.

30. Multiple Costing:

It refers to the method of costing followed by a business wherein a large variety of articles are produced, each differing from the other both in regard to material required and process of manufacture. In such cases, cost of each article is computed separately by using, generally, two or more methods of costing. For instance, for ascertaining the cost of a bicycle, cost of each part will be ascertained by using batch or job costing method and, then cost of assembling the parts will be ascertained by following the method of single or output costing.

31. Direct Expenses

Direct Expenses are also termed as **'Chargeable expenses'**. These are the expense which can be allocated directly to a cost unit. According to Chartered Institute of Management Accountants, London, direct expenses are 'cost other than materials and wages which are incurred for a specific product or saleable services'. Examples of direct expenses are:

(i) Hire charges of special machinery or plant for a particular production order or job.
(ii) Payment of royalties
(iii) Cost of special moulds, designs and patterns.
(iv) Experimental costs before undertaking the job concerned.

32. Characteristics of Direct Expenses:

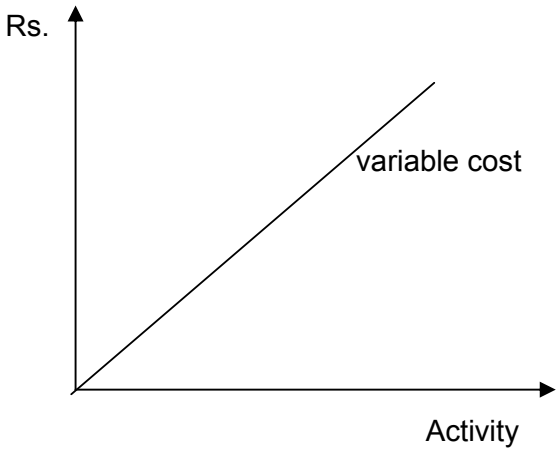
(i) Direct expenses are those expenses which are other than the direct materials & direct labour.
(ii) These expenses are either allocated or charged completely to cost centers or work orders.
(iii) These expenses are included in prime cost of a product.

The nature of direct expenses demands a strict control over such expenses. This feature of controlling direct expenses in business houses compels their management to treat some of the direct expenses as indirect expense. Sometime a direct expense is assumed as indirect due to the convenience. Sometimes a concern may treat an expense as direct whereas another may treat the same expense as indirect.

Analysis of Behavior- Wise Costs : Fixed ,Variable & Semi- Variable.

Variable cost: which directly varies with activity level or unit of activity is known as variable cost

Example Cost elements	Varies with Activity level
Material, Labour	Production, Volume
Electric, power	Kwh, Mwh
Transport	Distance
Rent, salary	Time period

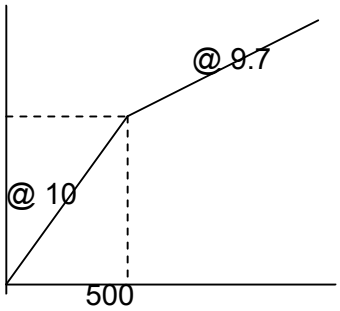


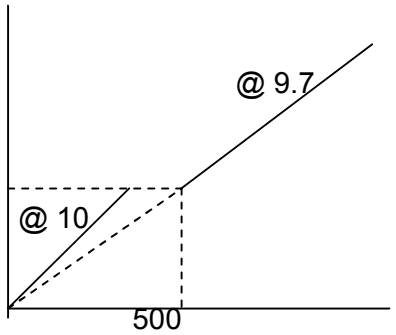
All these costs are fixed per activity

Variable cost/unit also may change as the production volume changes.

For e.g. material cost in general Rs. 10/kg. If the consumption is more then 500 kg. The ratio will decrease to 9.7. This decrease in rate is applicable for whole quantity. But if the problem mentioned it for additional Qty. only then we have to calculate the total cost a below.

For 600 kg.
Rate for additional Qty. = Total cost = 500×10+100×97
= 5,970
Nothing sold TC = 600×9.7
= Rs. 5,820





Fixed cost: which does not varies with production volume

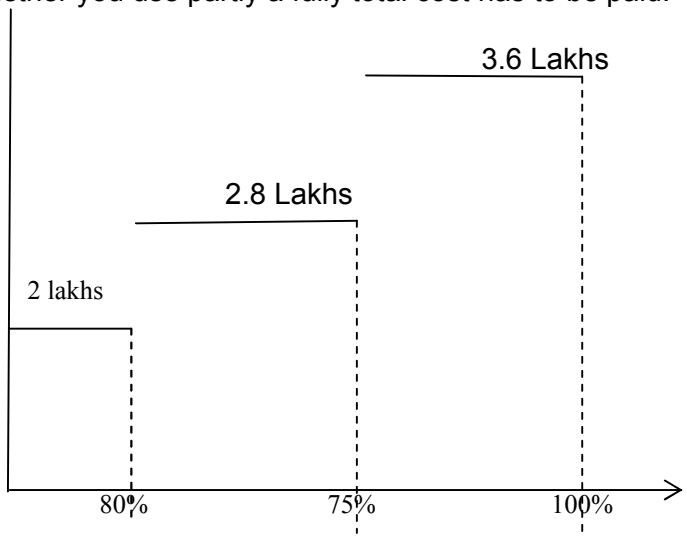
Fixed cost are of two types:

1. Committed Fixed cost – This cost are to be paid even when the production volume is zero. This cost can we saved only when the factory is totally closed down. That is why it is known as SHUT DOWN COST. For e.g. depreciation of the machine, rent of the factory premises, salary of the top management etc.
2. Discretionary Fixed cost -where the cost is to be incurred at the discretion of the top management & it has no direct relationship with the present product volume. For e.g.- advertisement, labour amenities, special machine or dice required for an additional offer etc.

Fixed cost are some times Step Fixed cost & Slab Fixed costs.

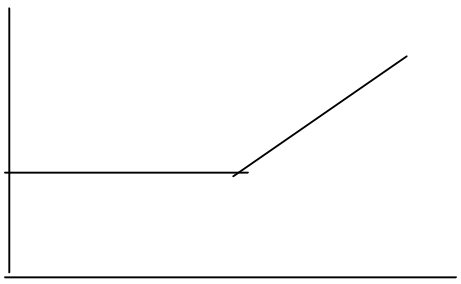
e.g. up 50% of capacity 2,00,000 p.a.
for every 25% or part three – 80,000 p.a.
off of additional capacity

Whether you use partly a fully total cost has to be paid.

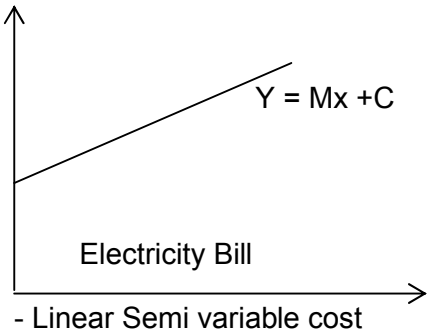


Q. What will be the total Fixed cost. If capacity utilization is 60% for 8 month & 80% for 4 months.

Semi variable cost – Which are partially fixed & partially variable cost .



e.g. Telephone Bill of BSNL land line
taxi meter



- Linear Semi variable cost

Semi-variable expenses are further segregated into fixed and variable expenses by any of the following methods

1. Comparison by period.
2. Comparison by level of activity-percentage of activity, Direct labour hours or machine hours etc.
3. High and Low points method.
4. Survey method.
5. Simultaneous Equation Method.
6. Scatter diagram.
7. Method of Least Squares.

Example:

1. Comparison By Period :

Period	Production units	Semi – variable overheads (Rs.)
1	120	2200
2	100	2000
Difference :	20	200

Variable overhead rate = Change in amount of S. V. overheads÷ Change in Quantity
= Rs. 200÷ 20 units = Rs. 10 per unit
Fixed overheads = S.V. overheads (-) Variable overheads.
= 2200 - (1200 x 10) = 2200 - 1200 = Rs. 1000

2. Comparison By Level of Activity:

Percentage of Activity Direct Labour Hours or Machine Hours etc.

	Level of activity	
Capacity (5)	80	100
Labour Hours	400	500
Maintenance exp. of a Plant (Rs.)	2600	2750

Answer :

		Rs.
	100%	2750
	80%	2600
Difference	20%	150

Variable overhead rate = Change in S. V. overheads÷ Change in level of activity
= Rs. 150÷ 20% = Rs. 75 for each 10% or Rs. 7.50 for each 1%
Fixed overheads = S.V. overheads (-) Variable overheads
= [2,600- {(7.50÷1%) ×80%}] = 2600 - 600 = Rs. 2000

OR

	Labour Hours	Rs.
	500	2750
	400	2600
Difference	100	150

Variable overhead rate = Rs. 150÷ 100 = Re. 1.50 per Labour hour.
Fixed overheads = 2750 - (500 x 1.50) = 2750 - 750 = Rs. 2,000

.

3. High and Low points Method :

Activity Level Hours	Semi-variable overheads (Rs.)
3000	10,000
7000	18,000
11,000	26,000

Answer:

	High Point	11000 hours	26,000
	Low Point	3000 hours	10,000
	Difference	8000 hours	16,000
	Variable overhead rate	= Rs. 16,000 ÷ 8000 hours	= Rs. 2 per hour.
	Fixed overhead	= 26,000 - (11000 2)	= 26,000 - 22,000 = Rs. 4,000
OR		= 10,000 - (3000x2)	= 10,000 - 6,000 = Rs. 4,000

4. Simultaneous Equation Method.

Y = mx + c where,

Y = total cost,
m = variable cost p. u.
x = no. of units; c = fixed cost

Any cost analysis or estimation on basis of the above principle is known as Flexible Budgeting system.

Problems

1. Goodluck Ltd. is currently operating at 75% of its capacity. In the past two years, the level of operations were 55% and 65% respectively. Presently, the production is 75,000 units. The company is planning for 85% capacity level during 2009-2010. The cost details are as follows :

	55% Rs.	65% Rs.	75% Rs.
Direct Materials	11,00,000	13,00,000	15,00,000
Direct Labour	5,50,000	6,50,000	7,50,000
Factory Overheads	3,10,000	3,30,000	3,50,000
Selling Overheads	3,20,000	3,60,000	4,00,000
Administrative Overheads	1,60,000	1,60,000	1,60,000
	24,40,000	28,00,000	31,60,000

Profit is estimated @ 20% on sales.

The following increases in costs are expected during the year :

	In percentage
Direct Materials	8
Direct Labour	5
Variable Factory Overheads	5
Variable Selling Overheads	8
Fixed Factory Overheads	10
Fixed Selling Overheads	15
Administrative Overheads	10

Prepare flexible budget for the period 2009-2010 at 85% level of capacity. Also ascertain profit and contribution.

2. The manager of a Repairs and Maintenance Dept. in response to a request, submitted the following budget estimates for his department that are to be used to construct a flexible budget to be used during the coming budget year.

Details of cost	Planned at 6,000 Direct Repair Hours Rs.	Planned at 9,000 Direct Repair Hours Rs.
Employee salaries	30,000	30,000
Indirect repair materials	40,200	60,300
Miscellaneous costs etc.	13,200	16,800

(a) Prepare a flexible budget for the department up to activity level of 10,000 repair hours (use increments of 1000).

(b) What would be the budget allowance at 8,500 direct repair hours ?

3. A department of ABC Company attains sales of Rs. 60,000 at 80% of its normal capacity & its expenses are given below :

	Rs.
Administrative Costs :	
Office salaries	9,000
General expenses	2%
Depreciation	750
Rates and taxes	875
Selling Costs :	
Salaries	8%
Traveling expenses	2%
Sales office	1%
General expenses	1%
Distribution Costs :	
Wages	1,500
Rent	1%
Other expenses	4%

Draw up flexible administration, selling and distribution costs budget, operating at 90%, 100% and 110% of normal capacity.

4. For a production department of a manufacturing company you are required to :

(a) Prepare a fixed budget of overheads;
(b) Prepare a flexible budget of overheads at 70% and 110% of budgeted volume;
(c) Calculate a department hourly rate of overhead absorption; as per (b) above.

The budgeted level of activity of the department is 5,000 hours per period and a study of the various items of expenditure reveals the following :

		Rs.	Re. per hr.
Indirect wages			0.40
Repairs	Up to 2,000 hours	100	
	For each additional 500 hours up to a total of 4,000 hrs.	35	
	Additional from 4,001 to 5,000 hrs.	60	
	Additional above 5,000 hrs.	70	
Rent and rates		350	
Power	Up to 3,600 hours		0.25
	For hours above 3,600		0.20
Consumable supplies			0.24
Supervision	Up to 2,500 hours	400	
	Additional for each extra 600 hours above 2,500 and up to 4,900 hours	100	
	Additional above 4,900	150	
Depreciation	Up to 5,000 hours	650	
	Above 5,000 hours and up to 6,500 hours	820	
Cleaning	Up to 4,000 hours	60	
	Above 4,000 hours	80	
Heat and lighting	From 2,100 hours to 3,500 hrs	120	
	From above 3,500 hrs. to 5,000 hours	150	
	Above 5,000 hours	175	

5. The cost sheet of a company based on a budgeted volume of sales of 3,00,000 units per quarter is as under:

	Rs. Per unit
Direct Materials	5.00
Direct wages	2.00
Factory overheads (50% fixed)	6.00
S/ Adm. Overheads (1/3 variable)	3.00
Selling price	18.00

When the budget was discussed it was felt that the company would be able to achieve only a volume of 2,50,000 units of production and sales per quarter. The Company therefore decided that an aggressive sales promotion campaign should be launched to achieve the following improved operations:

Proposal I:
-- Sale 4,00,000 units per quarter by spending Rs. 2,00,000 on special advertising
-- The factory fixed costs will increase by Rs. 4,00,000 per quarter.

Proposal II:
-- Sale 5,00,000 units per quarter subject to the following conditions.
-- An overall price reduction of Rs. 2 per unit is allowed on all sales.
-- Variable selling and Administration Costs will increase by 5%.
-- Direct Material costs will be reduced by 1% due to purchase price discounts.
-- The fixed factory costs will increase by Rs. 2,00,000 more.

You are required to prepare a Flexible Budget at 2,50,000, 4,00,000 and 5,00,000 units of output per quarter and calculate the profit at each of the above levels of output

6. The following are the details of the Budgeted and the actual cost in a factory for six months from January to June, 2008. From the figures given below you are required to prepare the production cost budget for the period from January to June, 2009.

	January - June, 2008	
	Budget	Actual
Production (units)	20,000	18,000
Material cost	Rs. 40,00,000 (2,000 MT @ Rs. 2,000)	39,90,000 (*1,900 MT @ Rs. 2,100)
Labour cost	Rs. 8,00,000(@ Rs.20 per hour)	7,99,920 (@ Rs.22 per hour)
Variable overheads	Rs. 2,40,000	2,16,000
Fixed overheads	Rs. 4,00,000	4,20,000

In the first half of 2009, production is budgeted for 25,000 units. Material cost per tonne will increase from last year's actually by Rs. 100 but is proposed to maintain the consumption efficiency of 2008 as budgeted.

Labour efficiency will be lower by another 1% and labour rates will be Rs. 22 per hour.
Variable and Fixed overheads will go up by 20% over 2008 actual.

You are required to estimate the total cost for the period January-June, 2009.

7. Delta Engineering Limited produces a uniform type of product and has a manufacturing capacity of 3,000 units per week of 48 hours. From the cost records of the company, the following data are available relating to output and cost for three consecutive weeks:

Week No	Units Manufactured	Direct Material Rs.	Direct Labour Rs.	Factory Overheads (Variable & Fixed) Rs.
1	1,200	9,600	3,600	31,000
2	1,600	12,800	4,800	33,000
3	1,800	14,400	5,400	34,000

Assuming that the Company charges a profit of 20% on selling price find out the selling price per unit when the weekly output is 2,000 units.

8. A factory can produce 60,000 units p.a. at its optimum (100%) capacity. The estimated costs of production are as under :

Direct material — Rs. 32 per unit.

Direct labour — Wage rate is Rs.20 per unit for production up to 30,000 units. For excess production over 30,000 units up to 40,000 units, the rate is 25% more and for excess production over 40,000 units the rate is 50% more.

During June 2009 there was stoppage of production for 40 hrs. due to machine breakdown and for this stoppage, ten workers in the department were paid wages at time rate of Rs.25/hr.

Indirect Expenses:

Fixed — Rs. 4,50,000 per annum

Variable — Rs. 15 per unit

Semi-variable — Rs 3,40,000 for 30,000 units
Rs. 4,00,000 for 40,000 units

Cost Sheet

Messer's …. (name of the company)

Cost Sheet for the product……. from …….. To……. Units produced….

Elements of costs	Amount (Rs.)
Direct material	Xx
Direct Labour	Xx
Direct expenses	Xx
Prime Cost →	Xx
Production or Works or Factory Overheads:	
Administration overhead of Production nature	Xx
Research & development cost	Xx
Quality control cost	Xx
Factory Cost →	Xx
Add: Opening WIP	Xx
Less: Closing WIP	Xx
Works Cost →	Xx
Add: Packing cost	Xx
Less: Credit for scrap	Xx
Cost of production →	Xx
Add: Opening stock of finished goods	Xx
Less: Closing stock of finished goods	Xx
Cost of goods sold →	Xx
Marketing overheads:	xx
Administration overhead of marketing nature	xx
selling overhead	Xx
Distribution overhead	xxx
Cost of sales	xx
Add: Profit	xxx
Estimated sales price	

Note:

1. **Direct expenses are the expenses other than direct material cost and direct employees costs which can be identified with the product. Generally these items are lumpsum nature & not a common for the products.**

Direct expenses include :

i) Cost of utilities such as fuel, power, water, steam, etc.,
ii) Royalty based on production

iii) Technical Assistance / know how fees (releted to Project Managers)
iv) Amortized cost of moulds, patterns, patents, etc.
v) Job charges

vi) Hire charges for tools and equipment
vii) Charges for a particular product designing, etc.,

2. Production / works overhead/ manufacturing Expenses :

i) Consumable stores and spares
ii) Depreciation of plant and machinery, factory building, etc.,
iii) Lease rent of production assets

iv) Repair and maintenance of plant and machinery, factory building, etc.,
v) Indirect employees cost connected with production activities
vi) Drawing and Designing department cost.

vii) Insurance of plant and machinery, factory building, stock of raw materials & WIP, etc.
viii) Amortized cost of jigs, fixtures, tooling, etc.
ix) Service department cost e.g. Tool Room, Engineering & Maintenance, Pollution Control.

x) Salaries for staff for production planning, technical supervision, factory administration etc.,
xi) Normal idle time cost & all normal losses. Abnormal losses are transfer to P& l a/c
xii) Expenses for stores management

xiii) Security expenses in the factory
xiv) Labour welfare expenses
xv) Dispensary and canteen expenses

3. Quality Control Cost

The quality control cost is the expenses incurred relating to quality control activities for adhering to quality standard. These expenses shall include salaries & wages relating to employees engaged in quality control activity and other related expenses. They have to check the uality of material received, quality of WIP, & quality of finished product.

4. Research and Development Cost

the research and development cost incurred for development and improvement of the process or the existing product shall be included in the cost of production. This cost is distributed on the basis of Product Life Cycle.

5. Administrative/ office / establishment Overheads

Administrative overhead needs to be analysed in relation to production activities and other activities e.g factory office, works manager office . Administrative overheads in relation to production activities shall be included in the cost of production. Administrative overheads in relation to activities other than manufacturing activities e.g. marketing, projects management, corporate office expenses, etc., shall be excluded from the cost of production. Nothing mentioned in the problem , consider it as a aprt of Marketing overhead the example of Admionistrative Expenses are

- Salaries of administrative and accounts staff
- General office expenses e.g. rent, lighting rates and taxes, telephone, stationery, etc.,
- Bank charges

- Audit fees
- Legal expense

- Depreciation & repair and maintenance of office building etc.

6. Selling costs are indirect costs related to selling of products or services and include all indirect cost in sales management for the organization.

- Salaries commission and traveling expenses for sales personnel
- Advertisement cost
- Legal expenses for debt realization
- Market research cost

- Royalty on sale
- After sales service cost
- Rent of the show room
- Travelling expenses
- Warranty claim

- Brokerage & commission
- Advertisement relating to sales and sales promotion
- Sales incentive
- Bad debt (deductible from actual sales), etc.,

7. Distribution Costs are the cost incurred in handling a product from the time it is completed in the works until it reaches the ultimate consumer.

- Transportation cost
- Cost of warehousing salable products
- cost of delivering the products to customers
- Secondary Packaging
- Freight & Forwarding
- Insurance of Warehousing & Storage

8. Additional Notes :

1. Primary packing costs is included in production cost whereas secondary packing cost is distribution cost. Primary packing is the minimum required packing at the time completion of production. So it should be added with the complete product although it is a Direct Expense.

2. In exceptional cases, for example in case of heavy industries equipment supply, installation cost at delivery site for heavy equipments which involves assembling of parts, testing etc., is included in production cost but not distribution cost. For example, installation cost of a gas turbine at plant site is included in the cost of production of gas turbine.

3. Items not included in product cost
   - Provision for bad debt & discount & rebate
   - Interest on loan unless the loan is taken for a specific machine
   - Provision for tax
   - Cash & Trade discount
   - Any charges of financial nature, etc

Problems : On the basis of Nature of Cost

1. **Shri Om Ganesh** Ltd. Furnishes the following particulars in respect of cost structure for the product 'Siddhi' for the quarter ended on 31st December, 2009 :-

	Rs.		Rs.
Opening Stock of Raw Materials	15,000	Productive Wages paid	52,000
Purchase of Raw Materials	75,000	Wages Outstanding	4,000
Freight and insurance on Materials	6,000	Factory expenses	20,000
Carriage inwards on Materials	4,000	Office expenses paid	32,000
Return of Material to suppliers	5,000	Office expenses prepaid	2,000
Closing stock of Materials	20,000	Selling expenses	20,000
Normal loss of Materials	2,000	Distribution expenses	5,000
Accidental loss of Materials	6,000	cost of Design	24,000
Packing Cost	12,600	Sale of Scrap	3,400
Closing W.I.P.	10.800	Closing Finished goods	8,300

The selling price is fixed by a profit of 20% on selling price. Prepare a cost sheet showing Direct Materials, Prime Cost, Works Cost, Cost of Sales and sales for the period.

2. Master Phone (P) Ltd. is manufacturing transistor sets and the following details are furnished in respect of its factory operation in the year ending 31st December 2009.

Work – in – Progress	Beginning (Rs.)	Closing (Rs.)
Material	10,000	15,000
Labour	12,000	14,000
Factory Expenses	6,000	7,000
	28,000	36,000

Stock of raw material in the beginning	80,000
Purchase of raw material	400,000
Direct labour	2,80,000
Stock of raw material at the end	60,000
Manufacturing expenses	85,000
Office & Admin. expenses (40% of Production nature)	53,000

Prepare a Cost Sheet. Units produced 6,000.

3. The following figure for the month of April, 2008 were extracted from the records of a factory.

	Rs.
Opening stock of Finished Goods (5,000 units)	2,30,800
Purchase of Raw Materials	14,05,100
Direct Wages	10,25,000
Packing Cost	3,45,000
Research & Development Cost	4,23,600
Testing cost	1,34,700
Factory Overhead	100% of Direct Wages
Administration Overhead of production nature	Rs. 20 per unit produced
Selling & Distribution Overhead	10% of Sales
Opening stock of material	Rs. 34,000
Closing stock of material	Rs. 56,000
Closing stock of Finished Goods (8,000 units)	?
Sales (45,000 units)	Rs.79,64,000
Closing WIP:	Rs. 4,03,000

Prepare a cost sheet assuming that sales are made on the basis of "First-in first-out" principle.

4. The following is the Manufacturing & P/L Ac. of Swastik Ltd. for the year ended 30th June 2009:

		Rs		Rs.
Opening Stock: Materials		2,000	Sales	5,00,000
Finished goods		3,000	Closing Stock:	
Royalty		24,000	Material	18,500
Purchase of materials		1,50,000	Finished goods	3,000
Direct wages		1,20,000		
Power		15,500		
Carriage on material		2,000		
Cost of a special design		5,000		
Gross profit c/d		2,00,000		
		5,21,500		5,21,500
Rent and rates:			Gross profit b/d	2,00,000
Office	Rs. 5,000		Interest on loan	4,500
Factory	Rs. 7,000	12,000	Sale of scrap (at works cost)	750
Telephone		3,000	Discount received	1,750
Advertisement		7,500		
Electricity:				
Office	3,000			
Factory	4,500	7,500		
Provision for bad debts		10,000		
Depreciation:				
On plant & Mach	6,000			
On Delivery Vans	2,000	8,000		
Income – tax		12,000		
Salaries		25,000		
Donations		7,000		
Establishment		10,000		
Depreciation on Furniture:				
Office	2,500			
Factory	2,000	4,500		
Rent of Warehouse		6,500		
Net Profit		94,000		
		2,07,000		2,07,000

You are required to prepare a statement showing classification of cost under different components from the above information after giving due consideration to the following facts:

(1) 60% of telephone expenses relate to office and 40% to sales department:
(2) 25% of salaries relate to factory, 50% to office and 25% to sales department;
(3) 30% of the establishment expenses relate to office and 20% to sales department & 50% of salaries relate to factory.

5. A factory produces and sells 1,000 unit of a product in July,2009 for which the following particulars are available:

Stock of direct materials on 1.7.09	Rs. 6,000
Purchase and receipt of direct materials in July, 2009	Rs. 1,44,000
Direct wages paid in cash in July, 2009 (includes Rs. 3,000 on account of June, 2009and an advance of Rs. 2,000)	Rs. 55,000
Works overhead charges for the month	Rs. 60,000
Stock of direct materials on 31.7. 2009	Rs. 10,000
Administration and selling overheads	Rs. 25 per unit
Sales price	Rs. 300 per unit

From the above particulars you are required to
(a) Prepare a cost statement for July, 2009,
(b) Estimate the sale price of a unit of the same product in August, 2009, assuming-

(i) 20% increase in direct materials cost,
(ii) 10% increase in direct wages,
(iii) 5% increase in works overhead charges,
(iv) 20% reduction in administration and selling overhead charges, and
(v) Same percentage of profit on sales price as in July, 2009.

6. The following figures are extracted on the Trial Balance of Go-getter Co. on 30th Sept. 2009 :

	Rs.
Inventories :	
Finished Stock	80,000
Raw Materials	1,40,000
Work-in-Process	2,00,000
Office Appliances	17,400
Plant & Machinery	4,60,500
Buildings	2,00,000
Sales	8,68,000
Sales Return and Rebates	14,000
Materials Purchased	3,20,000
Freight incurred on Materials	16,000
Purchase Returns	4,800
Direct Labour	1,60,000
Indirect Labour	8,000
Factory Supervision	10,000
Repairs and Upkeep-Factory	17,000
Heat, Light and Power	85,000
Rates and Taxes	16,300
Miscellaneous Factory Expenses	28,700
Sales Commission	33,600
Sales Traveling	11,000
Sales Promotion	22,500
Distribution Dept.-Salaries and Expenses	18,000
Office Salaries and Expenses	8,600
Interest on Borrowed Funds	2,000

Further details are available as follows :

(i)	Closing inventories :	Finished Goods	1,15,000
		Raw Materials	1,80,000
		Work-in-Process	1,92,000
(ii)	Accrued Expenses on :	Direct Labour	8,000
		Indirect Labour	1,200
		Interest on Borrowed Funds	2,000
(iii)	Depreciation provided on :	Office Appliances	5%
		Building	10%
		Plant & Machinery	12%

(iv) Distribution of the following costs :
Heat, Light and Power to Factory, Office, selling & Distribution in the ratio 6 : 2 : 1 : 1. Rates &Taxes 2/3 to Factory & 1/3 to Office. Depreciation on Buildings to Factory, Office & Selling in the ratio 6 : 2 : 2.
(v) 65% of administration overhead is of production nature.

With the help of the above information, you are required to prepare a cost sheet & a condensed Profit and Loss Statement of Go-getter Co. for the year ended 30th September, 2009.

Cost Sheet with Missing Figure.

7. The cost structure of an article, the selling price of which is Rs. 25,000 is follows :

Direct Material	:	50% of the Total cost
Direct Labour	:	30% of the Total cost
Overhead	:	Balance

Due to anticipated increase in existing material price by 25% and in the existing labour rate by 10%, the existing profit would come down by 20% if the selling price remains unchanged.

Prepare a comparative statement showing the cost, profit and sale price under the present conditions and with the increase expected for future, assuming the same percentage of profit on cost as at present (calculations may be made to the nearest rupee) had to be earned.

8. A fire occurred in the factory premises on October 31st , 2009. The accounting records have been destroyed. Certain accounting records were kept in another building. They reveal the for the period September 1st ,2009 to October 31st, 2009 :

(i)	Direct materials purchased	Rs.2,50,000
(ii)	Work in process inventory, 1.9.2009	Rs.40,000
(iii)	Direct material inventory, 1.9.2009	Rs.20,000
(iv)	Finished goods inventory, 1.9.2009	Rs.37,750

Indirect manufacturing costs	40% of conversion cost
Sales revenues	Rs.7,50,000
Direct manufacturing labour	Rs.2,22,250
Prime costs	Rs.3,97,750
Gross margin percentage based on revenues	30%
Cost of production	Rs.5,55,775

The loss is fully covered by insurance company. The insurance company wants to know the historical cost of the inventories as a basis for negotiating a settlement, although the settlement is actually to be based on replacement cost, not historical cost.

Required:-

Finished goods inventory, 31.10.2009
Work-in-process inventory, 31.10.2009
Direct materials inventory, 31.10.2009

Cost analysis in total cost ratio

9. A Co. makes two distinct types of vehicles A and B. The total expense during a period is shown by the books for assembly of 600 of A and 800 of B are as under :-

	Rs.
Material	2,20,000
Wages	3,00,000
Production overhead(unit basis)	5,19,800
Adm. and Selling Expenses	3,26,800

Other information:	A :B
Material cost ratio per unit	1 : 2
Wages cost ratio per unit	2 : 3

Calculate the cost of each vehicle giving reasons for the basis of apportionment adopted by you.

10. M/s Shaw & Co. manufactures two types of shoes A and B. Production costs for the year ended 31st March 2010 were:

	Rs.
Direct Material	15,00,000
Direct Wages	8,40,000
Production overhead	3,60,000
	27,00,000

There was no Work in Progress at the beginning or at the end of the year. It is ascertained that the cost per unit ratios are

(a) Direct Material in type A shoes consists twice as much as that in type B shoes.
(b) The direct wages for type B shoes were 60% of those for type A shoes.

(c) Production overhead was the same per pair of A and B type.
(d) Administrative overhead for each type was 150% of direct wages.
(e) Selling cost was Rs. 1.50 per pair.

(f) Production during the year were:
Type A 40,000 pairs of which 36,000 were sold.
Type B 120,000 pairs of which 100,000 were sold.

(g) Selling price was Rs. 44 for type A and Rs. 28 per pair for type B.

Prepare a Statement showing Cost and Profit.

Material : Pricing & Control

1. Purchase requisition

A purchase requisition is a form used for making a formal request to the purchasing department to purchase materials. Purchase requisitions are usually initiated by

(i) A store department for regular and standard items held in the stock.
(ii) The production control department for special material required for specific jobs.
(iii) The maintenance department for maintenance equipment and items of capital expenditure.
(iv) The heads of departments for office equipment.

2. Bin Cards :

Bin Cards are maintained in the stores. These cards relate to materials kept in appropriate bins, racks and containers in the stores. For each kind of material a separate record is kept on a Bin Card showing details of all receipts and issues and balances. These cards are usually stated to the corresponding bins, racks and are entered up by Storekeeper in quantitative terms. Maximum, Minimum, Re-ordering levels are also indicated on the cards. This enables the store-keeper to ask for replenishment of the stock, before the minimum stock levels are reached.

Bin Card

Bin No.	:	Location	:	Maximum	:
Description	:			Minimum	:
Code	:			Orderings	:
Unit	:			Reorder Qnt.	:

Date	Receipt		Issue		Balance Quantity	Physical Verification
	GRN No.	Qty.	MRN No.	Qty.		

3. Bill of Materials :

Bill of material is a complete schedule of parts and materials required for a particular order prepared by the Drawing Office and issued by it together with necessary blue prints of drawings.

For standard products, printed copies of Bill of materials are kept with blank spaces for any special details of modifications to be filled in for a particular job/order. The schedule details everything, even to bolts and nuts, sizes and weight.

The documents solves a number of useful purposes, such as -

(i) It provides a quantitative estimate of budget of materials required for a given job process or operation which might be used for control purposes.

(ii) it substitutes material requisitions and expedite issued of materials.

(iii) The store-keeper can draw up a programme of materials purchases and issues for a given period and

(iv) It provides the basis for charging materials cost to the respective job/process.

Generally four copies of it are prepared, one for each of the following departments :

a. Stores department
b. Production department
c. Cost Accountants department
d. Production planning department.

Proforma of Bill of Materials

Job No. …… No. ……

Department authorised Date ……

Sl. No.	Code No. of mat.	Description	Qty	Date of issue & Qty. Issued		Rate Rs.	Amount Rs.
				Date	Qty.		

Authorised by ……..

Store Keeper's signature ……

Received by ……

Checked by ……

Cost clerk……..

4. Bill of Materials and Stores Requisition

Bill of Material is a document prepared by the drawing office or the Production Control Department in an organization detailing the material specifications, quantities, weights, etc. required for manufacturing a product or for processing a job.

Material Requisition or Stores Requisition on the other hand is a document authorizing the storekeeper to issue materials to the consuming department.

5. Classification and codification of materials:

Proper classification and codification of various items of stores is essential for a good system of stores keeping. Materials in the stores may be classified either on the basis of their nature or on the basis of their usage. Former method is commonly used for classifying materials as construction materials, consumable stores.

Codification of classified materials can be done by using alphabetic, numerical or alphanumeric approaches. Under codification each item of stores is given a distinctive code number. Numeric system of Codification is commonly used. Under this method, the whole number are used to indicate the main group and the decimals to indicate primarily, secondary and other groups. For example, in a printing press, the following codes may be assigned:

Paper	130
Ink	131
Gum	132

If there are various grades, sizes or colors of say ink, these may be assigned the codes:

Ink Red	131.1
Ink Blue	131.2
Ink Green	131.4

Above method is suitable where the number of items is very large and also where punched card accounting is in use. Now a days Bar code also uses as codification of material.

6. Imprest System of Stores :

In order to overcome the limitations of Centralized Storing System in large organization, the practice of Imprest System of stores is resorted to. Under this system , each sub-stores attached to production departments is given an operating stock which is little more than the normal requirement. At the end of a specified period, the exact quantity issued out is replenished in bulk. This system has following advantages :

(I) facilitates day-to-day management through prompt issues of stores.
(ii) eliminates maintenance of elaborate inventory records thus reducing handling costs of them
(iii) combines the advantages of centralized stores with sub-stores without sacrificing the centralized control.

7. Perpetual Inventory and Continuous Stock Taking :

Perpetual Inventory is a system in which a continuous record of receipt and issue of materials is maintained by the stores department. In this system the stock control cards, bin cards and stores ledger show the receipts, issue and balance of each item at any point of times after each transaction. The stocks as per dual records namely bin card and stores ledger are reconciled on a continuous basis. The system facilitates planning and control.

Continuous Stock taking is a system of physical verification of stocks of each item on continuous basis. The actual quantity in the bin card is compared with bin balances. Such a verification is conducted round the year such that all items of stocks are verified 3 to 4 times in a year. Any discrepancies are investigated and reported for corrective action. It also serves as a moral check on stores staff and acts as deterrent to dishonesty.

A Perpetual Inventory System is usually supported by Continuous Stock taking. It calls for up to-date writing up of stores ledger and bin cards and stock control cards. The balances as per bin cards and stores ledger are compared when every receipt or issue is posted. The physical balance on continuous stock taking is also compared with the bin card or ledger balances. Thus monthly accounts can be prepared with confidence.

8. Distinguish between Bin cards and Stores Ledger

Bin Card	Stores Ledger
Bin cards are maintained in the stores and are serving the purpose of stock register.	Stores ledger is maintained in the cost accounts departments.
Entries in it are posted by the issue clerk. He records the quantity about receipts, issue and closing balance along with code number of materials maximum, minimum and reordered levels.	Here entries are posted by the stores ledger clerk. He recorded the quantities and value about receipts, issues and closing balance along with code number of materials, maximum, minimum and reorder levels.
Here transactions are posted individually.	Here transaction can be posted periodically
Posting is done at the time of issue of materials.	Posting is done after the issue of materials.

9. Just in Time (JIT) purchases

Just in time (JIT) purchases means the purchase of goods or materials such that delivery immediately precedes their use. Just –in-time(JIT) production (also called lean production) is a " demand- pull" manufacturing system in which each component in a production line is produced immediately as need in which by the next step in the production line. In a JIT production line, manufacturing activity at any particular workstation is promoted by the need for that station's output at the following station. Demand triggers each step of the production process, starting with customer demand for a finished product at the end of the process and working all the way back to the demand for direct materials at the beginning of the process. In this way, demand pulls and order through the production line.

Features :

a) Low or Zero inventories; emphasis on operation from source to customer .
b) Emphasis on customer service and timing. C) Short of operations.
d) Flexibility of operations. e) Efficient flow
f) Use of kanban and Visibility.

Benefits :

a. Reduce inventories and WIP
b. Reduce space requirements, set up time
c. Shorter throughput times
d. Greater employees involvement, participation & motivation
e. Smooth work force
f. Greater productivity
g. Improved product /service quality
h. Improved customer service & smaller batch size.
i. More uniform loading of facilities.

Pre –requisites of JIT:

(i) Low variety (ii) Demand stability (iii) Vendor reliability
(iv) Defect free materials. (v) Good Communication (vi) Preventive maintenance
(vii) Total quality control.

Desirable factors of JIT :

(i) Management commitment; (ii) Employee investment; (iii) Employee flexibility.

10. Material handling cost – treatment in cost accounts

First approach suggests the inclusion of these costs as part of the cost of materials by establishing a separate material handling rate e.g. at the rate of percentage of the cost of material issued or by using a separate material handling rate which may be established on the basis of weight of materials issued.
Under another approach these costs may be included along with those of manufacturing overhead and the charged over the products on the basis of direct labour or machine hours.

11. Cost of receiving and handling materials

Based on annual forecast of raw materials requirements the estimates of freight, insurance, storage, handling etc., can be worked out. The total of these estimated expenses is generally expressed as a percentage of total material cost and generally is the basis of recovery of the relevant expenditure.

12. Storage Loss

The losses may be broadly classified as: 1. avoidable; 2. unavoidable.

Avoidable losses are those which can be controlled through proper management , e.g. breakage and carelessness in handling, human error in posting, calculation, pilferage etc.
Unavoidable losses can be sub-divided into normal and abnormal. Normal unavoidable losses are inherent in the basic type of materials and are of unavoidable nature, e.g. evaporation, climatic conditions leading to shrinkage, deterioration etc. Abnormal unavoidable losses occur due to causes beyond the control of management, e.g. losses due to flood, earthquake etc.

Losses due to avoidable causes should be adjusted in the cost of materials consumed or included in stores overheads.

In case of normal avoidable losses, a reasonable amount may be provided on a standard rate fixed based on past experience/technical estimate, the excess loss should be charged to Costing Profit/Loss Account. Surpluses on deficiencies due to abnormal causes should be adjusted in Costing Profit/Loss Account.

13. Gain or loss through atmospheric variation :

Many items of raw materials are amenable to temperature changes, which may increase or decrease the apparent volume from that originally recorded at the time of entry into stores. Again there are also items for which wastage in stores may be inevitable due to evaporation.

While a conservative approach demands the gain in material due to atmospheric changes need not be considered in cost, any unusual gain may be credited to costing profit and loss account.
On the other hand adjustments for normal storage loss due to evaporation/atmospheric changes should be made in the original price. Abnormal losses are to be collected through a separate account and charged directly to profit and loss account.

14. Cost of Containers relating to materials purchased :

Usually the cost of the containers containing the materials purchased are included in the cost of materials and therefore is automatically form a part of material cost. The containers may be returnable or non returnable.

The cost of the non returnable containers should be charges as a part of the material cost and ultimately would go into the Prime Cost or Factory overhead depending upon the usage of the materials as direct or indirect.

In the case of returnable containers the cost of them should not be included either in cost of materials or in any other head because when they are returned to the supplier, full credit would be received. if, however, certain containers become damaged, the cost of those less any scrap value should be added to the cost of the materials. Where on return of the containers, credit is given at a reduced value i.e., less than its cost price, the difference between cost and credit rate should be charged to the materials cost.

15. Carriage and Cartage Expenses- treatment in Cost Accounts:

Carriage and Cartage expenses are incurred in the course of the movement of materials or goods. Materials may mean direct materials or indirect materials. The treatment of the Carriage and Cartage expenses differs with the kind of materials goods transported. The Carriage and Cartage expenses relating to raw materials are treated as a part of direct materials cost and those relating to indirect materials are treated as factory overhead and those relating to distribution of materials or finished goods are treated as distribution overhead. In case where the Carriage and Cartage are abnormal due to any reason the same is charged off to the Costing Profit and Loss Account.

16. ABC analysis of inventory control

It is a system of selective inventory control whereby the measure of control over an item of inventory varies with its usage value. It exercises discriminatory control over different items of stores grouped on the basis of the investment involved. Usually the items of material are grouped into three categories viz. A, B and C according to their use value during a period. In other words, the high use value items are controlled more closely that the items of low use value.

i. 'A' Category of items consists of only a small percentage i.e., about 10% of the total items of material handled by the stores but require heavy investment i.e., about 70% of inventory value because of their high prices and heavy requirement.

ii. 'B' Category of items comprises of about 20% of the total items of material handled by stores. The percentage of investment required is about 20% of the total investment in inventories.

iii. 'C' category of items do not require much investment. It may be about 10% of total inventory value but they are nearly 70% of the total items handled by stores.

17. Assumptions underlying EOQ:

The calculation of economic order of materials to be purchased is subject to the following assumptions:

(i) Ordering cost per order and carrying cost per unit per annum are known and they are fixed.
(ii) Anticipated usage of materials in units is known.
(iii) cost per unit of the materials is constant and in known as well.
(iv) The quantity of materials ordered is received immediately i.e., the lead time is zero.

The famous mathematician Wilson derived the formula which is used for determining the size or order for each of purchases at minimum ordering and carrying costs.

18. Different classes of stores:

Broadly speaking, there are three classes of stores viz.

a. central or main stores; b. sub – stores and; c. departmental stores.

Rules & Formulae on Materials

1. Minimum level of inventory = Re-order level - (Average rate of consumption × average time of inventory delivery i.e. lead time)
   Lead time is the time gap between placing an order & receiving the first consignment of it.

2. Maximum level of inventory = Re-order level + Re-order quantity – (Minimum consumption × Minimum re-order period)

3. Re-order level = Maximum re-order period × Maximum Usage, or
   Minimum level or safety stock level + (Average or normal rate of consumption × Average time to obtain fresh supplies).

4. Average inventory level = Minimum + ½ Re- order quantity. or
   (Maximum level + Minimum level) ÷ 2

5. Danger / Safety stock level = Avg. consumption × Lead time for emergency purchases

6. $$EOQ = \sqrt{\frac{2 \times \text{Annul consumption (A)} \times \text{ordering cost per order } (C_o)}{\text{Carrying cost per unit per annum } (C_h)}}$$

7. Total ordering cost = No. of order×ordering cost per order (C_o)
   No. of order = Annual consumption÷Quantity per order

   Annual carrying or Storing or Holding cost = Quantity per order÷2× C_h

   Carrying or storing or Holding cost p.u. p.a. = Purchase price × C_h %

   Total ordering & carrying cost (Known as Relevant Storing cost)

   $$= \sqrt{2 \times \text{Annul consumption} \times \text{ordering cost per order} \times \text{carrying cost p.u. p.a.}}$$

8. $$\text{EOQ in Rs.} = \sqrt{\frac{2 \times \text{Annual Consumption (Rs.)} \times \text{Ordering cost per order}}{\text{Carrying \%}}}$$

9. Stock out units = Consumption during the lead time - ROL.

   ∴Stock of quantity = Consumption during the lead time-ROL

   ∴Expected Stock out quantity =
   $\sum$ (Present Stock out quantity- increase in ROL) ×Probability

   Stock out cost = Expected Stock out quantity × Stock-out cost p.u.
   Storing cost = increase in stock × storing cost p.u. p.a.

   Select that level where total of annual carrying (storing) and stock out cost is minimum.

Problems on E.O.Q. Model

1. Zed company supplies plastic crockery to fast food restaurants in metropolitan city. One of its products is a special bowl, disposable after initial use, for serving soups to its customers. Bowls are sold in pack 10 pieces at a price of Rs. 50 per pack.

The demand for plastic bowl has been forecasted at a fairly steady rate of 40,000 packs every year. The company purchases the bowl direct from manufacturer at Rs. 40 per pack within a three days lead time. The ordering and related cost is Rs. 8 per order. The storage cost is 10% per annum of average inventory investment.

Required:

i) Calculate Economic Order Quantity.

ii) Calculate number of orders needed every year.

iii) Calculate the total cost of ordering and storage bowls for the year.

iv) Determine when should the next order to be placed. (Assuming that the company does maintain a safety stock and that the present inventory level is 333 packs with a year of 360 working days.

2. A company manufactures a product from a raw materials, which is purchased at Rs. 60 per kg. The company incurs a handling cost of Rs. 360 plus freight of Rs. 390 per order. The incremental carrying cost of inventory of raw materials is Re 0.50 per kg. per mensem. In additional the cost of working capital finance on the investment in inventory of raw materials is Rs. 9 per kg. per mensem. The annual production of the product is 1,00,000 units and 2.5 units are obtained from one kg of raw materials.

Required :

a. Calculate the economic order quantity of raw materials.

b. Advise, how frequently should orders for procurement be placed.

c. If the company proposes to rationalise placement of orders on quarterly basis, what percentage of discount in the price of raw materials should be negotiated ?

3. JP Limited, manufacturers of a special product, follows the policy of EOQ (Economic Order Quantity) for one of its components. The component's details are as follows :

	Rs.
Purchase Price per Component	250
Cost of an Order	100
Annual Cost of Carrying one Unit in Inventory	10% of Purchase Price
Total Cost of Inventory and Ordering Per Annum	4,000

The company has got 2 offer

a. discount of 2% on the price of the component provided the lot size is 2,000 components at a time.

b. discount of 5% on the price of the component provided all components will purchase at a time .

Compute the EOQ & advise whether the quantity discount offer can be accepted. Assume that the inventory carrying cost does not vary according to discount policy

4. The annual demand for an items of raw material is 4,000 units and the purchase price is expected to be Rs.90 per unit. The relevant incremental cost of processing an order is Rs.135 and the relevant cost of storage is estimated to be Rs.12 per unit.

(a) What is the optimal order quantity & the total relevant cost (order & store) of this order quantity ?

(b) Suppose that the Rs.135 estimated of the incremental cost of processing an order is incorrect & should have been Rs.80. Assume that all other estimates are correct. What is the cost of this prediction error. Assuming that the solution to part (a) is implemented for one year?

(c) Assume at the start of the period that a supplier offers 4,000 units at a price of Rs.86. The materials will be delivered immediately and placed in the stores. Assume that the incremental cost of placing this order is zero and the original estimate of Rs.135 for placing an order for the economic batch size is correct. Should the order be accepted ?

(d) Present a performance report for the purchasing officer, assuming that the budget was based on the information presented in (a) and the purchasing officer accepted the special order outlined in (c).

5. The EOQ of material X in 250 units. At EOQ total ordering cost in equal to Rs. 5000, the management places 4 orders during the year. One supplier gives an offer of a discount of Rs. 1,000 if the number of orders placed in 2. Comment with supporting calculation for the acceptability of the offer.

EOQ under different purchase price

6. A company is reviewing its stock policy, and has the following alternatives available for the evaluation of stock number 1278g5 :

(i)	Purchase stock twice monthly,	100 units.	(ii)	Purchase monthly,	200 units.
(iii)	purchase every three months,	600 units.	(iv)	Purchase six monthly,	1,200 units.
(v)	Purchase annually,	2,400 units.			

It is ascertained that the purchase price per unit is 80p for develop up to 500 units. A 5% discount is offered by the supplier on the whole order where delivers are 501 up to 1000, and 10% reduction on the total order for deliveries in excess of 1000. Each purchase incurs administration costs of Rs. 5. Storage, interest on capital and other costs are 25p per unit of average stock quarterly held. You are required to advise management on the optimum order size.

7. **In case of minimum or safety stock** The quarterly production of a company's product which has a steady market is 20,000 units. Each unit of a product requires 0.5kg of raw materials. The cost of placing one order for raw materials is Rs. 100 and the inventory carrying cost is Rs. 2 per kg. per annum. The lead time for procurement of raw material is 36 days and a safety stock of 1,000 kg. of raw material is maintained by the company. The company has been able to negotiate the following discount structure with the raw material supplier :

Order quantity (kg)	Up to 6,000	6,000-8,000	8,000-16,000	16,000-30,000	30,000-45,000
Discount (Rs.)	Nil	800	2,400	3,900	5,000

a. Calculate the re-order point taking 30 days in a month.

b. Prepare a statement showing the total cost of procurement and storage of raw materials after considering the discount if the company elects to place one, two or six order in the year.

c. State the number of order which the company should placed to minimize the costs after taking EOQ also Into consideration.

8. **EOQ in Rs.** Find the EOQ for a demand of Rs.4,00,000 for an ordering cost per order of Rs. 200 per order & 10% carrying cost .

9. **EOQ for total cost:** A company produces the component from a single raw material in economic lots of 2,000 units at a cost of Rs. 2 p. u.. Average annual demand is 20,000 units. The annual holding cost is Rs. 0.25 p. u. & the minimum stock level is set at 400 units. Direct labour costs for the component are Rs. 6 p. u., fixed manufacturing overhead is charged at a rate of Rs. 3 p. u. based on a normal activity of 20,000 units. The company also hires the machine on which the components are produced at a rate of Rs. 200/month. Calculate the cost of production.

Stock levels: ROL, MAX , MIN, Avg.

10. M/s. Tubes Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operation during 2009 :

Average monthly market demand	2,000 Tubes
Ordering cost	Rs.100 per order.
Inventory carrying cost	2% p.a.
Cost of tubes	Rs.500 per tube
Normal usage	100 tubes per week
Maximum usage	200 tubes per week
Minimum usage	50 tubes per week
Lead time to supply	6 – 8 weeks

Compute from the above :

a. Economic Order Quantity. b. If the supplier is willing to supply quarterly 1,500 units at a discount of 0.2%, is it worth accepting ? c. Maximum level of stock , Minimum level of stock , Re-order level.

Problems on stock out : Single Probability.

11. IPL Limited uses a small casting in one of its finished products. The castings are purchased from a foundry. IPL Limited purchases 54,000 castings per year at a cost of Rs. 800 per casting.

The casting are used evenly throughout the year in the production process on a 360 day per year basis. The company estimates that it costs Rs. 9,000 to place a single purchase order and about Rs. 300 to carry one casting in inventory for a year. The high carrying costs result form the need to keep the castings in carefully controlled temperature and humidity conditions, and from the high cost of insurance. Cost of stock out is 1,500 per unit.

Delivery from the foundry generally takes 6 days, but it can take as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the following tabulation:

Delivery time (days)	:	6	7	8	9	10
Percentage of occurrence	:	75	10	5	5	5

Required:

a. Compute the economic order quantity (EOQ)

b. Assume the company is will to assume a 15% risk of being out of stock. What would be the safety stock? The re-order point?

c. Assume the company is willing to assume a 5% risk of being out of stock. What would be the safety stock? The re-order point?

d. Assume 5% stock-out risk. What would be the total inventory cost at EOQ.

Optimum stock size under stock out situation

12. XYZ Company's experience of being out of stock in respect of a key item is as below :

Stock-out (number of units)	Number of times	
2,000	4	(1)
1,600	8	(2)
1,000	12	(3)
400	16	(4)
200	40	(10)
0	320	(80)

Figures in brackets represent percentage of times the item was out of stock. Assume that the Stock-out costs are Rs. 100 pr unit. The carrying cost of inventory is Rs. 10 per unit. Determine the optima level of Stock out inventory .

Pricing of material:

13. A timber merchant purchased 1,000 c.ft. of timber logs on 1st April, 2009 @ Rs. 400 per c.ft. and stored them in his timber yard for six months for seasoning. The following expenses were incurred during the period of seasoning :

Ordering cost of timber Rs. 1,800; Rent Rs. 4,250 p.m.

Salaries of 4 guards @ Rs. 2,500 p.m. each
Incidental expenditure for maintenance, power, lighting etc. ... Rs. 7,50,000.

Annual share of Administration overheads ..Rs. 12,10,000. 50% of the floor area of the Godown and other connected operations were incurred for stocking the seasoned timber. Loss in volume of the logs due to seasoning should be taken at 10%. Profit margin on cost was 15%.

Calculate the selling price of the seasoned timber per c.ft. on 1st October.

Inventory Control

14. Classify the material in A, B and C classification.

Model No	Annual consumption in pieces	Unit price in Rs.
501	30,000	10
502	2,80,000	34
503	3,000	10
504	1,10,000	5
505	4,000	5

Batch costing :

15. A Ltd. is committed to supply 24,000 bearings p.a. to B Ltd. on a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is Rs.324.

What should be the optimum run size for bearing manufacture ? What would be the interval between two consecutive optimum runs ? If the cost of bearings is Rs. 25 per unit, prepare Batch cost sheet .

Labour (Remuneration, Incentive & Cost Control)

1. Time Card and Job Card :

Time card is a document used to record the time of arrival and that of departure of workers in a factory and the information on total time spent thus obtained is used for calculating the wages payable to him where the method of remuneration is on time basis.

Job card on the other hand is a document used for recording the time spent by the workers on different jobs during the total time he has spent in the factory.

2. Time Rate Wages and Piece Rate Wages :

Under Time rate system of wages payment, the unit of measurement for remunerating the workers is time. This system disregards the output of a worker. The wages rate of the workers may be determined on hourly, daily, weekly or monthly basis.

Piece work system, on the other hand, represents a method of remunerating workers by results. Under this system payment is made with reference to output produced.

3. Overtime Premium & treatment of overtime premium in cost accounting.

Overtime is the amount of wages paid for working beyond normal working hours as specified by Factories Act or by a mutual agreement between the workers union and the management. According to Factories Act of 1948, a worker is entitled for overtime at double rate of his wages (including allowances) if he works beyond 9 hours in a day or 48 hours in a week.

In cost accounting the treatment of overtime premium will be as follows :

(a) When overtime is worked regularly throughout the year as company policy due to labour shortage: Calculate Average Wage rate = total labour cost including overtime premium ÷ Total hours works.

∴Labour cost of the job = Hours required for the job×rate as calculated above.

(b) When overtime is worked irregularly to meet spasmodic production requirement, the extra labour cost i.e. overtime premium will not be charged to customer, rather it is transfer to P & L A/c.

∴Labour cost of the Job = Time required for the job×Normal wage rate.

(c) When overtime is worked specifically at the customer's request to expedite delivery, customer has to pay the overtime premium including the normal labour cost.

∴Labour cost of the Job = normal Time × Normal wage rate.+ OT × OT Wage rate

4. Factors determining wage levels :-

(a) The demand for the labour and its availability.
(b) The capacity of the industry to pay.
(c) The existence of monopolies.
(d) The bargaining strength of the parties.
(e) The wage level in similar or other industries in the locality/area.
(f) The wage in relation to the cost of living. The wages should conform to the standard commanded by the selected occupation.

5. Factors determining individual workers remuneration :-

a) The amount of education and training necessary for the performance of the work.
b) The degree of difficulty, danger & inconvenience associated with the work.
c) The special human characteristics necessary for the performance of the work.
d) The intensity of the effort required.
e) The skill, initiative, sense of responsibility, cooperation and willingness.
f) Time keeping and productivity (quantity of work).
g) Reliability (Quality of work)
h) Loyalty to the undertaking in which the worker is employed.

6. Time and Motions Study:

Time study is concerned with the determination of standard time required by a person of average ability to perform a job.

Motion study is concerned with determining the proper method of performing a job so that there are no wasteful movements, hiring the worker unnecessarily. However, both the studies are conducted simultaneously.

Since materials, tools, equipment and general arrangement of work, all have vital bearing on the method and time required for its completion. Therefore, their study would be incomplete and would not yield its full benefit without a proper consideration of these factors.it is expressed to the workers with help of a SUMO CART.

7. Idle Time Wages :

Idle time represent the time for which wages are paid but no production is resulted.

Idle time can be classified as controllable and uncontrollable, and /or normal and abnormal.

The normal and uncontrollable idle time cost should be collected through a standing order number and charged off as an overhead. If the idle time can be allocated to a particular department its cost should be charged off to such departmental overhead and recovered over the units produced.

8. Fringe Benefits:

Fringe benefits are those expenses which are incurred by an employer against the individual employees for their welfare. Normally such expenses do not form a part of their pay packet, e.g. holiday pay, night shift allowance, pension facilities, ESI contribution by the employer, etc, Such expenses may be recovered separately as a percentage on labour cost or as an hourly rate. Alternatively, these may be treated as overheads and apportioned to cost centers on the basis of wages/salary cost.

9. Learners' Wages:

Wages paid to the learners during the period of their training should not be treated as part of regular wages since during this period they are not in a position to give the normal performances. These wages should be booked under separate standing order numbers and charged as an item of overheads. A fair method for distribution of this wages to various cost centers would be on the basis of number of learners trained in each month for each department. If the period of training varies in different departments a better method would be to distribute on the basis of number of training hours.

10. Leave Travel Assistance :

Leave travel assistance is paid to practically all the employees presently & therefore can be considered as a regular element of labour or staff cost as the case may be. This expenditure is of a fixed nature & can be easily predetermined. Depending whether the assistance is payable to direct labour, indirect labour or staff the expenditure should be treated as direct labour cost, production overhead cost or administrative/ selling overhead cost & should be appropriately charges.

11. Night Shift Allowance :

It is a customary practice that the persons working in night shifts are paid some extra and such an allowance is known as night shift allowance . Such additional expenditure caused by general pressure of work in excess of normal capacity are charged to general production overhead because otherwise jobs performed during days will be cheaper than the jobs completed during nights which by no means a fair proposition.

If the additional expenditure is incurred extremely as a result of pressing demands from customers such expenditure should directly be charged to the job concerned.

On the other hand if the night shifts are run for the default of a particular department the night shift allowance should be charged as the departmental overhead applicable to the concerned department.

12. Non-monetary Incentives :

(a) Free medical treatment for self and family.
(b) Canteen facilities, provision of subsidized meals

(c) Recreational facilities.
(d) Provision of accommodation, free transport, or subsidized transport.

(e) Educational facilities for the children of employees.

13. Casual worker and outworker :

A worker who is appointed for a short duration to carry on normal business activities in place of a regular but temporarily absent worker. Such a worker is also known as daily wager or ‘badlies’. A casual worker do not enjoy the facilities available to a regular worker.

A worker who do not work in the factory premises but either he works in his home or t a site outside the factory is known as an outworker. An outworker who workers in his home is usually compensated on the basis of his output. He is supplied with raw materials and tools necessary for carrying out the job. An outwork (outside the factory) is usually engaged on specialised jobs/contract work.

14. Foreman’s salary :

The foreman is mainly concerned with the supervision of man and machines in the workshop and so his salary is “works indirect expense” and must be charged to works expenses account and included in works overhead. It is apportioned on the basis of degree of supervision required on such machine or men.

If he devotes equal time for all the machines his salary should be equally charged off against all of them. In case he devotes more time to a particular machine or to a particular batch of workers proportionately higher share of his salary should be borne by the particular machine or batch of workers.

15. Labour cost control Steps.

a) Recruitment, placement and training cost.
b) Basis of remunerating labour.
c) Time-keeping and time Booking.
d) Comparison of actual and standard labour cost.
e) Control on indirect labour cost.
f) Quality of the output
g) Productivity of labour.

16. Control of indirect labour cost :

This can be ensured by fixing a ratio of direct to indirect labour. A comparative study in this area will indicate whether excess labour force is employed. Budgetary control is the best way to control indirect labour cost. For service departments the budgeted expenditure should be linked with service programme and the ratio control is to be introduced.

17. Basic consideration which govern remuneration of workers

a) Economic Principles :-The nation should be in a position to dispose of goods and services produced in the world market at economic prices & imparts such goods & services which are required to maintain the standard of living. Failure to maintain economic production will cause lowering of standard.

b) Employer Principles :- An employer wants to increase net profit by producing and selling a greater output at reduced cost through utilisation of labour, materials & machinery. As constant source is on for the means to increase productivity and decrease the cost per man hour.

c) Employee Principles :-The employee expects an appropriate reward for direct and indirect contribution to production of wealth. A workers duty is to work honesty and expect in return to be fairly rewarded monetarily, physically and mentally

18. Objectives of group bonus schemes

(i) Creation of the collective interest and team sprit among the workers.
(ii) Creation of interest among the superiors to improve performance.
(iii) Reduction of wastage in materials and elimination of idle-time.
(iv) Achievement of maximum out put at minimum cost.
(v) Encouragement of individual workers forming part of the team where only the output of the team as a whole can be measured.

19. Five schemes of group bonus, as indicated below :-

(a) Priestman's Production bonus
(b) Cost efficiency bonus
(c) Tower – gain sharing plan :-
(d) Budgeted expenses bonus
(e) Waste Reduction Bonus :-

20. Cost associated with labour turnover.

Two types of costs which are associated with labour turnover are :

Preventive costs : These includes costs incurred to keep the labour turnover as a low level i.e., cost of medical schemes. If a company incurs high preventive costs, the rate of labour turnover is usually low.

Replacement Costs : the examples of it are cost of advertising, recruitment, selection, training & induction, extra cost also incurred due to abnormal breakage of tools & machines, defectives, low output, accidents etc., cause due to the inefficiency & inexperienced new workers.

21. Causes of labour turnover:

a. Personal Causes

i. Change of jobs for betterment.
ii. Premature retirement due to ill health or old age.
iii. Domestic problems and family responsibilities.
iv. Discontentment over the jobs and working environment.

b. Unavoidable Causes

i. Seasonal nature of the business;
ii. Shortage of raw materials, power, slack market for the product etc :
iii. Change in the plant location;
iv. Disability, making a worker unfit for work;
v. Disciplinary measures;
vi. Marriage (generally in the case of women).
vii. Change in methods of production or new technology.

c. Avoidable Causes

i. Dissatisfaction with job, remuneration, hours of work, working conditions, etc
ii. Strained relationship with management, supervisors or follow workers;
iii. Lack of training facilities and promotional avenues;
iv. Lack of recreational and medical facilities;
v. Low wages and allowances.

22. Effects of labour turnover :

a. Even flow of production is disturbed;
b. Efficiency of new workers is low;
c. productivity of new but experienced workers is low in the beginning;
d. There is increased cost of training and induction;
e. New workers cause increased breakage of tools, wastage of materials etc.

23. Remedial steps to minimise labour turnover :

1. Exit Interview: An interview may be arranged with each outgoing employee to ascertain the reasons of his leaving the organisation.

2. Job analysis and evaluation : Before recruiting workers, job analysis and evaluation may be carried out to ascertain the requirements of each job.

3. Scientific system of recruitment, placement and promotion : The organisation should make use of a scientific system of recruitment selection, placement and promotion for employees.

5. Use of Committee : Issues like control over workers handing their grievances etc., may be dealt by a committee comprising of members from management and workers.

Rules For labour costs

A. **Gross Labour cost = Basic wages+ Allowances +Overtime+ bonus & incentives**

Labour Cost of Employer = Gross wages of Worker + Employer's contribution to Provident Fund (PF) & Employees State Insurance scheme (ESI). It is also known as cost to company (CTC)

Earning of the Employee = Gross wages – Employees contribution to PF & ESI. It is known as take home.
In general , labour cost = Earning.

B. **Basic Wages computation**

1. **Time Basis** = **Hrs worked × Rate per Hr.**
2. **Production Basis** = **Units produced × Rate per unit**
3. **Guaranteed Time Wages** = **Higher of Basic Wages under Time or Production basis**

C. **Bonus or Incentive computation**

A. **Efficiency plan.**
B. **Saving Plan : cost & time saving Individual incentive.**
C. **Group Bonus Scheme: for direct & indirect workers.**

D. **Efficiency is measurement**

a. on time basis	**time allowed ÷ time taken**
b. on output basis	**actual output ÷ standard or budgeted output**
c. on cost basis	**budgeted cost ÷ actual cost**

Note : Time allowed or standard time = normal working time + premium.

E. **Bonus or Individual incentive**

Halsey system = 50% of time saved × Time rate
Rowan system = Time saved÷Time allowed × Time taken × Rate per hour

F. **Group Bonus Scheme:** follow class notes:

G. **Labour Turnover i.e. change in labour force due to**

1. **Separation = Resign + Retirement + Retrenchment + Death**
2. **Accessions= Replacement + New recruitment .**
3. **The results of labour turnover in Flux method = Replacement +Separation +New requirement.**

Rules:
(i) Replacement method = Number of employees replaced ÷ Average employees.
(ii) Separation method = No. of employees separated ÷ Average employees.

(iii) New Recruitment Method = No. of newly Employed ÷ Average employees.

(iv)

$$\text{Flux method} = \frac{\text{Number of employees (separated + accessions)}}{\text{Average employees}} \times 100$$

Computation of wages:

1. Calculate the earnings of A and B from the following particulars for a month and allocate the labour cost to each job X, Y and Z :

	A	B
(i) Basic Wages	Rs. 1,000	Rs. 1,600
(ii) Dearness Allowance	50%	50%
(iii) Contribution to Provident Fund (on basic wages)	8%	8%
(iv) Contribution to Employees' State Insurance (on basic wages)	2%	2%
(v) Overtime	Hours 10	

The normal working hours for the month are 200. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to State Insurance and Provident Fund are at equal rates with employees' contributions. The two workers were employed on jobs X, Y and Z in the followings proportions (Overtime was done on Job Y.) :

	Jobs		
	X	Y	Z
Worker A	40%	30%	30%
Worker B	50%	20%	30%

2. Betayet Ltd. a small company manufacturing one type of component in a single operation. The company employs 10 direct workers on a basis 40 hour week at Rs.3 per hour with a guaranteed minimum weekly wage of Rs.120 per operative. The maximum amount of overtime that may be worked, paid at time rate plus one third, is in total 200 hours per week. Additional direct workers cannot be recruited.

The average time for one operative to manufacture one component is 40 minutes.

Demand for the product varies considerably, the minimum weekly output is 450 units, but for a significant part of the year the company cannot satisfy total demand despite working the maximum overtime hours available. The nature of the component is such that stocks of work in progress or finished goods cannot be stored.

After appropriate studies have been made, an incentive scheme has been proposed, based upon a standard operator time of 30 minutes per component, in which operative will be paid Rs.2 for each component produced. The guaranteed minimum wage would still apply, and , if required, overtime would continued to be worked, up to the maximum shown above, and be paid at the previous time rate premium.

The selling price of the component is Rs.9 per unit, material costs Rs. 2 per unit, variable overheads varying with hours worked Rs.3 per hour, and fixed overheads Rs.1200 per week. Produce columnar revenue accounts, comparing weekly profits at the following activity levels :

(a) Under the current wages scheme, at
  (i) minimum weekly output ;
  (ii) Current maximum output ;

(b) Under the proposed incentive scheme, with labour achieving standard efficiency, at
  (i) minimum weekly output,
  (ii) current maximum output,
  (iii) proposed maximum output,

Efficiency Plan

3. XYZ Ltd. employs its workers for a single shift of 8 hours for 25 days in a month. The company has recently fixed the standard output for a mass production item and introduced an incentive scheme to boost output. Details of wages payable to the workers are as follows :

(.i) Basic wages/piece work wages @ Rs.2 per unit subject to a guaranteed minimum wages of Rs.60 per day.

(ii) Dearness allowance at Rs.40 per day.

(iii) Incentive bonus :
Standard output per day per worker : 40units;
Incentive bonus up to 80% efficiency : Nil;
Incentive bonus for efficiency above 80% : Rs.50 for every 1% increase above 80%

The details of performance of four workers for the month of April 2009 are as follows :

Worker	No. of days Worked	Output (units)
A	25	820
B	18	500
C	25	910
D	24	780

Calculate the total earnings of each of the workers.

4. The budgeted annual production of a company is 1,20,000 units, each unit requiring 2 ½ hours at an hourly wage rate of Rs. 15. Currently the average efficiency of the production workers is only 60%. The management has a scheme to raise this to 75%. The scheme involves upgrading the machinery and intensive training of the production workers, at an a cost of Rs. 10 lakhs per annum. The scheme also proposes to raise the wage rate to Rs. 16 per hour to enlist the full co-operation of the workers. Examine the scheme and state whether it can be accepted or not.

5. A company uses an old method of machining a part manufactured for sale. The estimates of operating details for a year are as under:-

No of parts to be manufactured and sold 30,000. Raw materials required per part: 10 kg. @ Rs. 2/- kg. Average wage rate per worker: Rs. 40/- per day of 8 hours. Average labour efficiency 60%. Standard time required to manufacture one part 2 hours. Overhead rate Rs. 10/- per clock hour. Material handling expenses 2% of the value of raw materials.

The company has a suggestion box scheme and on award equivalent to three months saving in labour cost is passed on the employee whose suggestion is accepted.

In response to this scheme suggestion has been received from an employee to use a special Jig in the manufacture of the aforesaid part. The cost of the Jig which has life of one year is Rs. 3,000/- and the use of the Jig will reduce the standard time by 12 minutes.

Required:-

a. Compute the amount of award payable to the employee who has given the suggestion.

b. Prepare a statement showing the annual cost of production before and after the implementation of the suggestion to use the Jig and indicate the annual savings.

c. State the assumptions on which your calculations are based.

Incentive on the basis of saving in cost & time

6. In a manufacturing concern, bonus to workers is paid on slab rate based on cost towards labour and overheads. The following are the slab rates :

up to 10% saving	5% of earning.
up to 15% saving	9% of earning.
up to 20% saving	13% of earning
up to 30% saving	21% of earning.
up to 40% saving	28% of earning.
above 40% saving	32% of earning.

The wage rate per hour of 4 worker– P, Q, R and S– are respectively RS. 10.0, 11.0, 12.0 and 14.0. Overhead is recovered on direct wages @ 200%. Standard costing per unit = 300 (includes labour & overhead). The workers have completed one unit in 8, 7, 5.5 and 5 hours respectively. Calculate in respect of each worker : Amount of hours earned., Total earnings &Total earnings per hour.

7. In a factory payment of wage bonus is made to the workmen based on percentage of time saved in time allowed in the following scale :

Time Saved (% of standard)	Bonus (% of time saved)
up to 20%	10%
Above 20% up to 40%	Plus 25% of time saved above 20% up to 40%
Above 40%	Plus 33 and 1/3% of time saved beyond 40%

Calculate the earnings of the worker from the following data.

	P	Q	R	S
Time allowed	120	200	150	20 units in 10 hours
Time taken	77	110	120	90
Wage rate per hour (Rs)	20	30	40	25
Average output	--	--	--	250 units

8. The proprietor of Instant Services which has been recently started, has not yet made regular arrangements for manning his three sections ; the one using electric typewriters for typing out the stuff neatly the other one for taking out the requisite number of copies through photocopying machines and the third for stretching. Binding and putting the stuff in presentable folders.

As an experimental measure, the proprietor engages A, B and C purely on a temporary basis for one month to be in complete charge of the three sections and offers to them the following three modes of weekly payment :

(i) A base rate of Rs. 6 per hour and 25% of all reductions in expenses below a “norm” of Rs. 600 per week.

(ii) A flat wage of Rs. 7 per hour.

(iii) No base rate is fixed but a bonus of Rs. 300 for meeting the “norm” plus 10% of all reductions in expenses below the “norm”.

The month consists of 4 weeks of 40 hours’ effective work.

A, B and C can each choose any of the three methods of payments. They made their choice before starting employment. The expenses incurred for four weeks of the month are as under :

Week Salesmen.	1 Rs.	2 Rs.	3 Rs.	4 Rs.
A	735	520	490	774
B	600	560	615	540
C	600	600	600	600

Present in a tabular statement the earnings of A, B and C for each week by each of the three methods and advise which of the three methods would have been of maximum advantage to each of them.

Bonus Plan : Halsey & Rowan & etc

9. Standard output in 10 hours is 240 units; actual output in 10 hours is 264 units. Wages rate is Rs. 10 per hour. Calculate the amount of bonus and total wages under Emerson plan.

10. Using Taylor's differential piece system, find the earning of A from the following particulars:

Standard time per piece	12 minutes
Normal rate per hour (in a 8 hours day)	Rs. 20
A Produced	37 units

11. In factory bonus system, bonus hours are credited to the employee in the proportion of time taken which time saved bears to time allowed. Jobs are carried forward from one week to another. No overtime is worked and payment is made in full for all units worked on, including those subsequently rejected.

Calculate for each employee

a. The bonus hours and amount of bonus earned,
b. The total wages cost, and
c. The wages cost each good unit produced.

	A	B	C
Basic wage-rate per hour Rs.	25	40	30
Units produced	2,500	2,200	3,600
Time allowed per 100 units	2 hrs. 36 min.	3 hours	1hr.30 min.
Time taken	52 hours	75 hours	48 hours
Rejects	50 units	40 units	40 units

12. The finishing shop of a company employs 60 direct workers is paid Rs. 1,600 as wages per week of 40 hours. When necessary, overtime is worked up to a maximum of 15 hours per week per worker at time rate plus one-half as premium. The current output on an average is 6 units/ man hour which may be regarded as standard output. If bonus scheme is introduced, it is expected that the output will increase to 8 units per man hour. The workers will, if necessary, continue to work overtime up to the specified limit although no premium on incentives will be paid.

The manufacturer is considering introduction of either Halsey Scheme or Rowan Scheme of Wage Incentive system. The budgeted weekly output is 19,440 units. The selling price is Rs. 20 per unit and the direct Material Cost is Rs. 8 per unit. The variable overheads amount to Rs. 5 per direct labour hour and the fixed overhead is Rs. 29,000 per week.

Prepare a Statement to show the effect on the Company's weekly Profit of the proposal to introduce :

(a) Halsey Scheme and (b) Rowan Scheme.

13. A worker, whose day-work wages is Rs. 30 an hour, received production bonus under the Rowan Scheme. He carried out the following work in a 44 hour week. The time allowed are:

Job 1	1,600 items at 5 hours per 1,000
Job 2	1,800 items at 3 hours per 1,000
Job 3	9,000 items at 6 hours per 1,000
Job 4	1,500 items for which no "standard time" was fixed and it was arranged that the worker would be paid a bonus of 25 per cent. Actual time on the job was 4 hours.
Job 5	2,000 items at 8 hours per 1,000 each item was estimated to be half-finished.

Job No. 2 was carried out on a machine running at 90% efficiency and an extra allowance of $1/9^{th}$ of time was given to compensate the worker.5 Hours were lost due to power cut. Calculate the earnings of the worker, clearly stating your assumptions for the treatment given by you for the hours lost due to power-cut.

14. A company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three systems, which are under consideration of management:

Worker	A	B	C
Actual hours worked in a week	38	40	34
Hourly rate of wages	Rs.6	Rs.5	Rs. 8
Production in units:			
Product P	21		60
product Q	36		135
Product R	46	25	

Standard time allowed per unit of each product is:

	P	Q	R
Minutes	12	18	30

For the purpose of piece rate, each minute is valued at Rs. 0.10. Your are required to calculate the wages of each worker under:

a. Guaranteed hourly rates basis.
b. Piece work earnings basis, but guaranteed at 75% of basic pay (guaranteed hourly rate) if his earnings are less than 50% of basic pay.
c. Premium bonus basis where the worker receives bonus based on Rowan scheme.

Solution by Algebraic Equation:

15. Two workmen, Vishnu and Shiva, produce the same product using the same material. Their normal wage rate is also the same. Vishnu is paid bonus according to the Rowan system, while Shiva is paid bonus according to the Halsey system. The time allowed to make the product is 100 hours. Vishnu takes 60 hours while Shiva takes 80 hours to complete the product. The factory overhead rate is Rs. 10 per man-hour actually worked. The cost of production for the product for Vishnu is Rs. 7,280 & for Shiva it is Rs. 7,600. Find the normal rate of wages; the cost of materials.

16. In a factory bonus to workman is paid according to the Rowan Plan. The allotted time for a job is 40 hours and the normal rate of wages is Rs. 1.25 per hour. The factory overhead charges are 50 paise per hour for the hours taken. The factory cost of a work order, executed by one worker is Rs. 69.5 and that by another is Rs. 64. The cost of material in each case is Rs. 10. Calculate the amount of time taken by the respective workman to complete the work order.

Group Incentive Scheme

17. In a unit 10 men work as a group. When the production of the group exceeds the standard output of 200 pieces per hour, each man is paid an incentive for the excess production in addition to his wages at hourly rates. The incentive is at half the percentage, the excess production over the standard bears to the standard production.

Each man is paid an incentive at the rate of this percentage of a wage rate of Rs. 60 per hour. There is no relation between the individual workman's hourly rate and the bonus rate.

In a week, the hours worked are 500 hours and the total production is 1,20,000 pieces.

Compute the total amount of the bonus for the week.
Calculate the total earnings of two workers A and B of the group :

A worked 44 hours and his basic rate per hour was Rs. 70
B worked 48 hours and his basic rate per hour was Rs. 80

18. Two fitters, a laborer and a boy undertake a job on piece-rate basis for Rs. 12,000. The time spend by each of them is 220 ordinary working hours. The rates of pay on time-rate basis, are Rs. 12.50 per hour for each of the two fitters, Rs. 10.00 per hour for the laborer and Rs. 7.50 per hour for the boy

Calculate the amount of piece-work premium and the share of each worker, when the piece-work premium is divided proportionately to the time wages paid.

Calculate the selling price of the above job on the basis of the following additional data :
Cost of direct material Rs. 22,010, works overhead at 20% of Prime Cost, Selling overhead at 10% of cost of production and profit at 25% on cost of sales.

19. Components for an assembly are produced under the control of the production manager. These are assembled and sold under the supervision of the Sales Manager.

The Production Manager is entitled for a bonus payment for himself at $1/8^{th}$ & the workers at 7/8 th of the difference between the notional value & the cost of production of the delivered components The national value is assessed at Rs. 5,18,500 for the components issued to assembly.
The Sales Manager is entitled to bonus of 2½ % of the profits for himself and 12½ % is distributed to his Sales Staff. The Sales during a period amount to Rs. 6,50,000.
From the under mentioned particulars detail the calculations involved in arriving at the bonus for both the Manager and the Staff. Find also the impact of such bonus as a percentage on sales.

	Rs.
Raw materials at the beginning of the period	22,800
Raw materials at the end of the period	16,400
Purchases during the period	2,40,600
Wages production	46,200
Wages assembly	18,100
Overheads production	2,12,500
Overheads Sales	45,200
Credit for scrap realised pertaining to components	8,700
Work in progress of production at the beginning	12,500
Work in progress of production at the end	18,200
Completed assemblies at the beginning	24,000
Completed assemblies at the end	65,000

Labour turnover

20. The extracts from the payroll of Messrs. Maheshwari Bros., is as follows :

Number of employees at the beginning of 2009	150
Number of employees at the end of 2009	200
Number of employees resigned	20
Number of employees discharged	5
Number of employees replaced due to resignations and discharges	20

Calculate the labour turnover rate for the factory by different methods.

21. The Managing Director of All Found Limited is very much perturbed to see that labour turnover is increasing every year. Before taking appropriate action, he desires to know the profit foregone on account of Labour Turnover. You are required to calculate the profit foregone on account of labour turnover from the following.

ALL FOUND LTD : Income Statement for the year ended 31.12.09:

Sales		Rs. 20,00,000
Variable cost :	Rs.	
Material	5,00,000	
Direct Labour	4,00,000	
Variable overhead	4,00,000	13,00,000
Contribution		7,00,000
Less : Fixed Overhead		3,25,000
Profit before tax		3,75,000

The Direct Labour hours worked in the concern during the period were 20,300 of which 500 hours pertained to the new workers on training. Only 40% of the trainees' time was productive. As replacement for the worker left was delayed for some time, 600 productive hours were lost.

The direct costs incurred by the Company as a consequence of labour separation & replacements were as follows (not included in above statement):

Separation costs -- Rs. 20,000, Selection costs-- Rs. 30,000 and Training costs--Rs. 50,000.

22. The LTO of an organisation 10%, 5%, 3% respectively under Flux Method, Replacement Method & Separation Method. If the number of workers replaced during that quarter is 30 , find the no of workers a. recruited & joined ; b. left & discharged

General problems

23. An article passes through five operations as follows :

Operation No.	Time per article	Grade of work	Wage rate per hour
1	15 minutes	A	Rs. 65
2	25 minutes	B	Rs. 50
3	10 minutes	C	Rs. 40
4	30 minutes	D	Rs. 35
5	20 minutes	E	Rs. 30

The factory works 40 hours a week and the production target is 600 dozens per week. Prepare a statement showing for each operation and in total the number of operators required, the labour cost per dozen and the total labour cost per week to produce the total target output.

24. For quoting consultancy fee, it has been decided to provide for Bonus at 20% of the fee, payable to the officers and have a profit mark-up at 25% on the total cost inclusive of such bonus. For a particular assignment. The cost has been estimated at Rs. 75,000/-. Compute the bonus that should be charged, to provide for the aforesaid fees.

Overhead, Absorption costing & Job Costing

1. Define Production / Factory / Works / Manufacturing overhead. Give some Examples.

Production Cost is the cost of all items involved in the production of a product or service. It includes all direct costs and all indirect costs related to the production.

Production overhead is the indirect costs involved in the production process i.e. it includes those costs of production process which are not attributable to the prime cost of the product.

Production overhead is also termed as factory overhead or manufacturing overhead. Examples of Production overhead :

- Salaries for staff for production planning, technical supervision, factory administration etc.,
- Normal idle time cost

- Expenses for stores management
- Security expenses in the factory
- Labour welfare expenses

- Dispensary and canteen expenses
- Depreciation of plant and machineries
- Repair and maintenance of factory building and plant & machineries
- Insurance

- Quality control
- Consumable stores and spares
- Lease rent of production assets

- Repair and maintenance of plant and machinery, factory building, etc.,
- Indirect employees cost connected with production activities
- Drawing and Designing department cost.

- Insurance of plant and machinery, factory building, stock of raw materials & WIP, etc.
- Amortized cost of jigs, fixtures, tooling, etc.
- Service department cost such as Tool Room, Engineering & Maintenance, Pollution Control etc.

2. Codification of overheads :

Coding is a technique of intelligently describing in number/ letters or a combination of both the lengthy description of numerous cost Accounting heads or ease of recording and controlling of the cost data generated. Codes are developed after accepting/ developing a coding system.

Objectives of codification : The important objectives of codification of overheads are as follows:

(1) To group items of similar nature, which are amenable to apportionment of overhead expenses on the same basis.

(2) To facilitate the task of allocation and apportionment of overheads over different departments or cost centers.

(3) To carry out an analysis of overhead expenses for control purposes.

(4) To reduce the task of maintaining a huge number of accounts.

(5) To help the task of machine accounting system in large organization.

Methods of codification : The important methods of codification of overheads are as follows:

(i) Straight Numbering system : under this system each type of expenditure is allotted a fixed number for example:

Standing order number ; 10 for indirect materials
Standing order number ; 11 for indirect labour

(ii) Number Blocks : According to this method, a block of numbers is generally earmarked indicated the major heads of expenditure e.g. 1–50 for service labour 51–100 for maintenance; 101 – 150 for fringe benefits etc.

(iii) Combination of symbols and numbers : Under this method a combination of symbol alphabet and a number is used to represent a code. Here symbol alphabet stands for the main head of the expenditure and the number represents the concerned department. For example in the Code R1 and R2 , R stands for repairs and '1' and '2' stand for building and machines respectively. In other words:

R1 – Repairs of building
R2 – Repairs of machines

(iv) Filed Method or Numerical Code: Under this method codes used are numeric in nature and each code number usually consist of nine digits. The first two digits indicate the nature of expenses viz. variable or fixed. The next three digits indicate head of expenses : the next two digits stand for the analysis of expenses and last two digits indicate the cost centre, where expenses have been incurred, for example in code 101200105; 10 stand for variable cost; 120 for idle time; 01 for waiting of materials and 05 for lathe shop or;

Code	particulars
10/120/01/105	Variable/idle time/ waiting for Mat./Lathe shop.

(v) The mnemonic Method : Under this method English alphabet are used as codes. For example R.F.B. may be used as a code for repairing factory building.

Out of the above five methods, the filed method is considered to be most suitable for the purpose of codification of overhead expenses in large size business organization. The main plus point of this method is that a code given to an item of expenses represents for of its characteristics. Also another feature of this method is that a large number of items of overhead expense can be accommodated under this type of codification. Lastly this method is easy to operate in case mechanical system of accounting is in vogue in the concern.

3. Rules & procedure for determining overhead recovery rate:

A. COLLECTION
B. CLASSIFICATION :
C. COST ALLOCATION :
D. COST APPORTIONMENT :
E. RE-APPORTIONMENT OR SECONDARY DISTRIBUTION. (Ref q-6)
F. COMPUTATION OF RECOVARY RATES ON SUITABLE BASIS
G. OVERHEAD ABSORPTION or RECOVARY or CHARGED or ADDED or APPLIED BY PREPARING A JOB COST SHEET

A. COLLECTION :

There are seven main sources of cost data relating to factory overheads (Actual)

1. Purchase day book ;
2. Overheads invoices ;
3. Stores requisitions. These three meant for collection of indirect materials cost.
4. Wages analysis book for indirect wages.
5. Cash book and petty cash book.
6. Journal proper.
7. Other registers like plant and machinery.

B. CLASSIFICATION :

There may be three broad categories of factory overheads.

1. Plant overheads: it is the overhead of top management which is at the head of all functional departments.
2. Overheads relating to production dept. or cost centre
3. Overheads relating to service dept.

All the factory overheads are to be classified to suit the purpose of cost accounting, whether item wise i.e. rent, insurance, depreciation etc., or function-wise. Standing order numbers are used for collecting the factory overheads. Cost Account numbers (known as **standing order no.**) are used for collecting the Administration, Selling and Distribution overheads.

C. COST ALLOCATION :

When items of cost are identifiable directly with some products or departments such costs are charged to such cost centers or functional areas.

This process is known as cost allocation.

Example Wages paid to workers of service department can be allocated to the particular department. Indirect materials used by a particular department can also be allocated to the department.

Cost allocation calls for two basic factors-(i) concerned department/product should have caused the cost to be incurred, and (ii) exact amount of cost should be computable.

D. COST APPORTIONMENT :

In case of single product organization no apportionment is required as all the costs are divided by the total no. of units to get the recovery rate.

In case of multi product organization the overheads distributed amongst the cost centres on some predetermined basis. This method is known as cost apportionment.

The determination of suitable basis of apportionment is very important and usually following principles are adopted for such process:

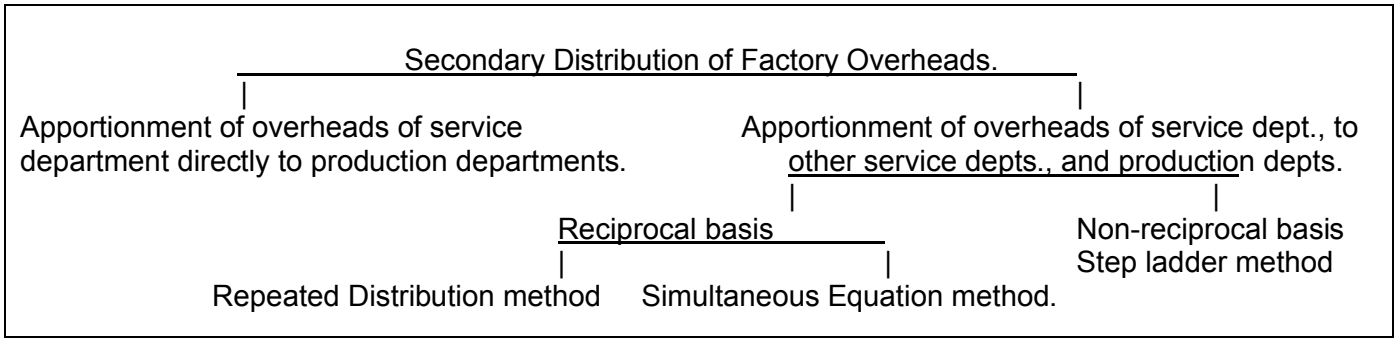
(i) service or use,
(ii) survey method,
(iii) ability to bear.

A basis once adopted should be reviewed at periodic intervals to improve upon the accuracy of apportionment. The following tables indicates the various bases of apportionment :

Item of factory Overhead	Basis of apportionment
1. Rent……	Area or volume of building
2. Depreciation of Machinery…….	% of original cost of machinery or machine hour rate
3. Power or motive power…….	HP rating ,Horse power multiplied by machine hours or KWH or value of machine or machine hour.
4. Electric lighting…….	Number of light points or area.
5. Canteen expenses……..	Number of meal served or employees no.
6. Store-keeping and materials handling….	Number of stores requisition or material consumed
7. Indirect wages of maintenance department ..	Estimated or actual time spent. or direct wages
8. Delivery expenses……..	Weight, volume or ton-kilo-metre
9. Repairs of plant……..	Value of plant.
10. Supervision…….	no. of machine/employee or floor space.
11. Fire Insurance…….	Value of Asset or area occupied.
12. Machine shop exp……	Machine hours or Labors hours.
13. General Exp……	Direct Wages or LHR
14. Maintenance of building……	Area or labour hours.
15. Civil Service Dept…….	Area.
16. Crane service…….	Crane hours or weight of materials handled.
17. Miscellaneous ……	Labour hour/ labour cost.

E. RE-APPORTIONMENT or SECONDARY DISTRIBUTION. (Ref q-6)

This is done on the basis of service render by a service dept. to other service dept.



Remember:-

Cost of service = own cost + received from other service dept.

F. COST ABSORPTION or RECOVARY or CHARGED or ADDED or APPLIED

Recovery Rate = Budgeted overhead ÷ basis of recovery

Bases are of four types

1. Unit Basis
2. LABOUR COSTS
3. MACHINE HOUR
4. LABOUR HOUR

OVERHEAD Charged or Recovered or Applied or Absorbed = Recovery Rate x Actual basis of recovery.

G. Under or Over recovery & its treatment

If the actual overheads exceed the amount applied to production it is said to be under absorption. That mean all overheads could not be absorbed. If the actual overheads are less than the amount applied to production, it is said to be over-absorption.

If un-recovered amount is due to management fault then that amount will be transferred to Costing P & L a/C. the rest amount is treated as follows

This amount is treated as follows:

1. Supplementary overhead rate : If the under-absorption is significant, supplementary overhead rate is computed and applied to the jobs or number of units as follows :
   Supplementary overhead rate = Under-absorption of factory overhead ÷ Actual base

   Or distribute the amount in the ratio as given in the problem

2. Transfer to current year's costing P and L a/c :- If the under-absorption is minor and insignificant, it may be transferred to the current year's costing P and L a/c., without re-opening the various job accounts involved.

3. Transfer to next year : Alternatively, the under-absorption can be transferred to the next year's Factory overhead control account with the hope that the same can be adjusted in the next year. But this method is not recommended as most of the overhead are period costs and related to time.

   Note : Adjustment and accounting treatment of over-absorption of factory overheads can be done in the reversal way.

General Problems:

1. Superfines Ltd. has furnished the following half- yearly budgeted data for the half year ended 31st March,2010. Compute the departmental overhead recovery rates for each of the production departments, assuming that the overheads are charged as a percentage of direct wages.

		Production Department			Service Department	
		A	B	C	X	Y
Direct Wages	Rs.	4,000	6,000	8,000	2,000	4,000
Direct Materials	Rs.	2,000	4,000	4,000	3,000	3,000
No. of Employees	(No).	100	150	150	50	50
Electricity	MWH	8,000	6,000	4,000	2,000	2,000
Light Points	No	10	16	4	6	4
Asset Value	Rs.	1,20,000	80,000	60,000	20,000	20,000
Area Occupied, Sq.Meters		150	250	100	50	50

The overhead expenses for the above period were :

	Rs.		Rs.
Motive Power	3,300	Lighting	400
Stores Expenses	800	Staff Welfare Expenses :	4,800
Depreciation	30,000	Repairs	15,000
Rent, Rates and Taxes	12,000	General Expenses	12,000

Apportion the expenses of service department 'X' in proportion to the direct wages and that of service department 'Y' in the ratio of 5 : 3 : 2 to production department 'A', 'B' and 'C'.

2. ABC Ltd. has three production departments P1, P2 and P3 and two service departments S1and S2. The following data are extracted from the records of the company

	Rs.		Rs.
Rent & Rates	62,500	General lighting	27,500
Indirect wages	48,750	Power	25,000
Depreciation on machinery	50,000	Insurance of machinery	20,000

Other Information:

	P1	P2	P3	S1	S2
Direct wages (Rs.)	37,500	25,000	37,500	18,750	6,250
HP of Machine used	60	30	50	10	--
Cost of machinery (Rs.)	3,00,000	4,00,000	5,00,000	25,000	25,000
Floor space (sq.ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	--	--

Expenses of the service departments S1 and S2 are reapportioned as below:

	P1	P2	P3	S1	S2
S1	20%	30%	40%	--	10%
S2	40%	20%	30%	10%	--

Required:

(i) Compute overhead absorption rate per production hour of each production department.

(ii) Determine the total cost of product X which is processed for manufacture in department P1, P2 and P3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is Rs. 625 and direct labour cost is Rs. 375.

3. RST Ltd. has two production departments: Machining and Finishing. There are three service departments: human Resource (HR), Maintenance & Design. The budgeted costs in these service departments are as follows:

	HR (Rs.)	Maintenance (Rs.)	Design (Rs.)
Variable	1,00,000	1,60,000	1,00,000
Fixed	4,00,000	3,00,000	6,00,000
	5,00,000	4,60,000	7,00,000

The usage of these Service Departments' output during the year just completed is as follows:
Provision of Service output (in hours of service)

	Providers of Service		
Users of service	HR	Maintenance	Design
HR	--	--	--
Maintenance	500	--	--
Design	500	500	--
Machining	4,000	3,500	4,500
Finishing	5,000	4,000	1,500
Total	10,000	8,000	6,000

Required:
i) Use the direct method to re-apportion RST Ltd.'s service department cost to its production departments.
ii) Determine the proper sequence to use in re-apportioning the firm's service
iii) Use the Step-down method to reapportion the firm's service department.

4. An engine manufacturing company has two production departments:
(i) Snow mobile engine and ; (ii) Boat engine and

two service departments;
(i) Maintenance and (ii) Factory office.

Budgeted cost data and relevant cost drivers are as follows:

Departmental costs:	Rs.
Snow mobile engine	6,00,000
Boat mobile engine	17,50,000
Factory office	3,00,000
Maintenance	2,40,000

Cost drivers:	
Factory office department:	No. of employees
Snow mobile engine department	1,080 employees
Boat engine department	270 employees
Maintenance department	150 employees
	1,500 employees

Maintenance department:	No. of work orders
Snow mobile engine department	570 orders
Boat engine department	190 orders
Factory office department	40 orders
	800 orders

Required
(i) Compute the cost driver allocation percentage and then use these percentage to allocated the service department costs by using direct method.
(ii) Compute the cost driver allocation percentage and then use these percentage to allocate the service dept. costs by using non-reciprocal method/step method.
(iii) Calculate cost of service following Reciprocal method.
(iv) Other ranking for step ladder

5. A company has three production departments (M_1, M_2 and A_1) and three service department, one of which Engineering service department, servicing the M_1 and M_2 only. The relevant information are as follows:

	Product X	Product Y
M_1	10 Machine hours	6 Machine hours
M_2	4 Machine hours	14 Machine hours
A_1	14 Direct Labour hours	18 Direct Labour Hours

The Annual budgeted overhead cost for the year are:

	Indirect Wages Rs.	Consumable supplies Rs.
M_1	46,520	12,600
M_2	41,340	18,200
A_1	16,220	4,200
Stores	8,200	2,800
Engineering Services	5,340	4,200
General Service	7,520	3,200

	Rs.	
Depreciation on Machinery	39,600	
Insurance on Machinery	7,200	
Insurance on Building	3,240	(Total building insurance cost for M_1 is one third of annual premium)
Power	6,480	
Light	5,400	
Rent	12,675	

(The general service deptt. Is located in a building owned by the company. It is valued at Rs. 6,000 and is charged into cost at notional value of 8% per annum. This cost is additional to the rent shown above).

The value of issues of materials to the departments are in the same proportion as shown above for the Consumable supplies. The budgeted material consumption is Rs.1,20,000

The following data are also available:

Department	Book value Machinery Rs.	Area (sq. ft.)	Effective HP hours%	Production Direct Labour hours	Capacity Machine hours
M_1	1,20,000	5,000	50	2,00,000	40,000
M_2	90,000	6,000	35	1,50,000	50,000
A_1	30,000	8,000	05	3,00,000	
Stores	12,000	2,000	--		
Engg. Service	36,000	2,500	10		
General Service	12,000	1,500	--		

Required:

(i) Prepare a overhead analysis sheet, showing the bases of apportionment of overhead to departments.

(ii) Allocate service department overheads to production department ignoring the apportionment of service department costs among service departments.

(iii) Calculate suitable overhead absorption rate for the production departments.

(iv) Calculate the overheads to be absorbed by two products, X and Y.

6. E–books is an online book retailer. The Company has four departments. The two sales departments are Corporate Sales and Consumer Sales. The two support-departments are Administrative (Human resources, Accounting), and information systems. Each of the sales departments conducts merchandising and marketing operations independently.

The following data are available for October, 2009:

Departments	Revenues	Number of Employees	Processing Time used (in minutes)
Corporate Sales	Rs. 16,60,750	42	2,400
Consumer Sales	Rs. 8,33,000	28	2,000
Administrative	-	14	400
Information systems	-	21	1,400

Cost incurred in each of four departments for October, 2009 are as follows:

Corporate sales	Rs. 12,97,700
Consumer sales	Rs. 6,36,800
Administrative	Rs. 94,510
Information systems	Rs. 3,04,720

The company uses number of employees as a basis to allocate Administrative costs and processing time as a basis to allocate Information systems cost.

Required

a. Allocate the support department costs to the sales department using the direct method.

b. Rank the support departments based on percentage of their services rendered to other support departments. Use this ranking to allocate support costs based on the step-down allocation method.

c. How could you have ranked the support departments differently?

d. Allocate the support department costs to two sales departments using the reciprocal allocation method. Also compute the cost p.u. of service provided.

7. Following data are given to you from which you are required to calculate the machine hour rate & composite machine hour rate of two production departments A and B. There are two service departments X and Y as well as an establishment department E (i.e. Administrative office). The data given are the annual expenses budgeted for the year .

Expenditure	Total amount Rs.	Remarks
Establishment expenses	13,60,000	Distribute on the basis considered best by you.
Indirect labour	16,00,000	Allocate Rs. 3,00,000 to each of the service departments and the balance to production departments on the basis of your choice, according of cost accounting principles.
Fuel consumption	12,00,000	Only department B consumes fuel.
Rent	10,00,000	Both for factory and office
factory general expenses	21,95,000	Allocate as per floor space but not for office.

The following table is also supplied to you :

		Prod. department		Service department		Estb. Dept.
	Total	A	B	X	Y	E
Floor space(sq. ft.)	1,00,000	40,000	30,000	15,000	10,000	5,000
Direct labour hours	4,20,000	2,00,000	1,50,000	50,000	20,000	-
Machine hours	2,00,000	10,00,000	8,00,000	5,20,000	-	-
Direct Wages (Rs.)	109.91,000	50.00,000	30,00,000	15,20,500	14.70,500	-
Personnel employed	3,500	1,200	1,200	600	300	200
Value of Plant and Tools stock at purchased value (Rs.)	32.5 lakhs	15.0 lakh	10.0 lakh	7.5 lakh	-	-
Amortisation of tools as a percentage on straight line method	-	25	25	25	-	-

Service department Y renders service to A, B, and X departments. Service department X renders service to production departments only. Expenses apportioned to service department Y are to be distributed to service department X and production departments on the basis of direct labour hours. Expenses of service department X are to be distributed to production departments on the basis of machine hours.

Also calculate the job cost & sale price at 20% mark up on the basis of two recovery rates as computed above if the material cost is Rs. 15,000 & hours requirement

	LHR	MHR
Department A	800	1,120
Department B	500	1,500

8. Book-don Public Ltd Co. manufacturers 3 products in two production departments, a machine shop and a fitting section; it also has two service departments, a canteen and a machine maintenance section. Shown below are next year's budgeted production data and manufacturing costs for the company.

Product:	X	Y	Z
Production	4200 units	6900 units	1700 units
Prime cost :			
Direct materials	Rs. 11 per units	Rs. 14 per unit	Rs.17 per unit
Direct Labour :			
Machine shop	Rs. 6 per unit	Rs. 4 per unit	Rs. 2 per unit
Fitting section	Rs. 12 per unit	Rs. 3 per unit	Rs. 21 per unit
Machine hours per unit	6 hours per unit	3 hours per unit	4 hours per unit

	Machine Shop	Fitting section	Canteen	Machine maintenance Section	Total
Budgeted overheads (Rs.):					
Allocated overheads	27 660	19 740	16 600	26 650	90 650
Rent, rates, heat and light					17 000
Depreciation & insurance of equipment					25 000
Additional data :					
Value of equipment (Rs.)	150 000	75 000	30 000	45 000	
Number of employees	18	14	4	4	
Floor space occupied (square meters)	3 600	1 400	1 000	800	

It has been estimated that approximately 70% of the machine maintenance section's costs are incurred servicing the machine shop and the remainder incurred servicing the fitting section.

Calculated a machine hour rate for the machine shop & a rate expressed as a percentage of direct wages for the fitting section. All workings and assumptions should be clearly shown. Also shown the job cost sheet of the products.

9. A factory has (i) two production departments (ii) two service departments, i.e. Electrical Department and Stores Department and (iii) one Administrative Department.

Following figures have been taken from the financial book:

	Rs.
Spares parts	
Opening Balance	2,00,000
Purchases during the year	1,00,000
Closing Balance	1,00,000
Power	2,10,000
Fuel for Production Department A	50,000
Maintenance and Repairs to Plant and Machinery	90,000
Wages of Indirect Workers	3,40,000
Administrative Staff Salary	60,350
Depreciation on Plant and Machinery	3,00,000
Loss of Raw Materials	50,000

Notes:

(i) Maintenance and Repairs to Plant and Machinery of Rs. 90,000 include Rs. 40,000 for a through overhauling of a machine classified as major capital repairs

(ii) General Miscellaneous expenses of Rs. 1,15,000 include Rs. 30,000 for developing patent of a new item not produced during the year.

(iii) Loss of Raw Material Rs. 50,000 includes Rs. 20,000 lost by fire cover by fire insurance policy and the balance represents normal storage losses. The insurance admits only to the extent of 90% of the losses.

(iv) Administrative Department receives least inter-departmental service from the other two service departments, i.e. Electrical and Stores Departments.

(v) Electrical Department renders more service to other department compared to what it receives.

Following additional information is supplied to you.

Name of Expenses	Production Depart – A	Production Depart – B	Electrical	Stores	Administrative
Direct wages	Rs.2,00,000	Rs. 4,00,000	1,00,000	1,00,000	50,000
Stores and spares Parts Consumption	50%	30%	20%	---	---
Power / Kwh	50,000	30,000	5,000	20,000	---
Material consumed	Rs.5,00,000	4.00.000	18,000	----	---
Lighting Units	10,000	6,000	3,000	5,000	2,500
Value of Plant and Machine value	Rs. 12 lakhs	Rs. 12 lakhs	Rs. 6 lakhs	---	---
Number of Personnel	400	300	200	100	50

You are require to work the overhead rates of department A and B expressed as percentages on direct labour up to one decimal point.

Cost of service

10. Find out the cost of each unit of production of the service departments from following data :

Service Departments	Steam	Water	Power
Production	18,800 MT	7,00,000 CM.	30,00,000 KWH
	Rs.	Rs	Rs.
Direct Materials	33,50,000	42,80,000	55,50,000
Direct Labour	21,60,000	23,90,000	41,50,000
Direct Expenses	13,60,000	11,24,000	11,80,000
Overheads	24,74,240	21,58,000	32,72,000
Steam	-	-	10,000 MT
Water	56,000 CM	-	1,05,000 CM
Power	1,46,400 KWH	4,20,000 KWH	60,000 KWH

Also find the cost recovered in production.

Recovery in unit basis:

11. A company of repute manufactures 4 varieties of a product : namely K. L. M and N. If the company manufactures only one variety, the monthly production can be either 5000 of K. or 10,000 of L or 15,000 of M or 30,000 of N.

From the following information you are required to find the profit or loss made on each variety, showing direct cost, product cost and total cost.

	Varieties			
Products	K	L	M	N
Actual production in a month	675	1,800	4,050	9,450
	Rs.	Rs.	Rs.	Rs.
Direct Wages	38,000	55,500	27,500	61,000
Direct Material Cost	39,500	46,500	49,000	77,500
S. Price per unit	550	640	535	442

Factory overhead expenses for the month are Rs. 8,10,000. Selling and distribution cost is to be calculated @ 10% of cost of production. Overhead expenses are to be allocated to each variety on the basis of units produced.

Recovery on Hour Basis

12. A department uses an overhead absorption rate of Rs. 2 per hour absorb the departmental variable and fixed overhead.

Activity level in hours	Budget cost allowance (Rs.)
3,200	7,040
3,600	7,520
4,800	8,960

From the information given above you are required to calculate:

(I) the total budgeted fixed overhead; and

(ii) the normal activity level on which the Rs. 2 rate was based.

(iii) find the total cost at 5,000 hours.

13. In a factory, the expenses of factory are charged on a fixed percentage basis work overhead on wages and office overhead expenses are calculated on the basis of percentage of works cost.

Following information is supplied to you:	I order	II order
Material	12,500	18,000
Wages	10,000	14,000
Selling Price	44,850	61,880
Percentage of profit on Cost	15%	12%

Find out percentage for factory overhead and office overhead.

Capacity & idle capacity & its cost

14. A manufacturing unit produces electronic circuits at the rate of 6 pieces an hour. The unit works in single shift of 8 hours during a six-day week and remains closed for 18 days a year, on account of holidays. Idle time is half an hour per day per worker. Average maintenance hours per month is 20 for cleaning and maintenance of equipment. Against an average annual output of 12,000 pieces during last ten years, the actual output achieved during the year was 10,800 pieces. The fixed overheads for the year amounted to Rs. 25,40,000.

You are required to calculate the idle capacity costs on the assumption that overhead recovery rates are based on maximum capacity, practical capacity, normal capacity and actual capacity utilisation respectively.

15. A machinery was purchased from a manufacturer who claimed that his machine could produce 36.5 tonnes in a year consisting of 365 days. Holidays, breakdown, etc., were normally allowed in the factory for 65 days. Sales were expected to be 25 tonnes during the year and the plant actually produced 25.2 tonnes during the year. You are required to state the following figures

(a) Rated capacity (b) Practical capacity
(c) Normal capacity (d) Actual capacity

On the basis of Behavior of Cost:

16. ABC Ltd. generates and produces its own power. Data for Power Costs are as follows :

	Production Dept.		Service Dept.	
Horse Power Hours :	A	B	X	Y
Needed at capacity production	10,000	20,000	12,000	8,000
Used during the month of May	8,000	13,000	7,000	6,000

During the month of May, costs for generating power amounted to Rs. 9,300; of this Rs. 2,500 was considered to be fixed cost. Service Dep. X renders service to A, B and Y in the ratio 13:6:1 while Y renders services to A and B in the ratio of 31:3 Given that the direct labour hours in Dept. A and B are 1,650 hours and 2,175 hours respectively, find the power Cost per labour hour in each of these two Dept.

17. PQR Ltd. Has its own power plant, which has two users, Cutting Department and Welding Department. When the plans were prepared for the power plant, top management decided that its practical capacity should be 1,50,000 machine hours. Annual budgeted practical capacity fixed costs are Rs.9,00,000 and budgeted variable costs are Rs.4 per machine-hour. The following data are available:

	Cutting Department	Welding Department	Total
Actual Usage in 2008-09 (machine hours)	60,000	40,000	1,00,000
Practical capacity for each department (machine hours)	90,000	60,000	1,50,000

Required:

a. Allocate the power plant's cost to the cutting and the welding department using a single rate method in which the budgeted rate is calculated using practical capacity and costs are allocated based on actual usage.

b. Allocate the power plant's cost to the cutting and welding departments, using the dual rate method in which fixed costs are allocated based on practical capacity and variable costs are allocated based on actual usage.

c. Allocate the power plant's cost to the cutting and welding departments using the dual rate method in which the fixed-costs rate is calculated using practical capacity, but fixed costs are allocated to the cutting and welding department based on actual usage. Variable costs are allocate based on actual usage.

Machine Hour Rate

18. From the details furnished below calculate a comprehensive machine hours rate:

Normal working hours for the month (Machine capacity 75%)	200 hours
	Rs.
Original purchase price of the machine (depreciation 10% p.a.)	3,24,000
Wages of Machine man	125 per day (of 8 hours)
Wages for a Helper (Machine attendant)	75 per day (of 8 hours)
Power cost for the month for the time worked	. 15,000
Supervision charges apportioned for the machine centre for the month	3,000
Electricity & Lighting for the month	7,500
Repairs & maintenance (machine) including consumable stores per month	17,500
Insurance of plant & Building (apportioned) for the year	16,250
Other general expenses p.a.	27,500

The workers are paid a fixed Dearness allowance of Rs. 1,575 per month. Production bonus payable to workers in terms of an award is equal to 33.33% of basic wages and dearness allowance. Add 10% of the basic wages and dearness allowance against leave wages and holiday with pay to arrive at a comprehensive labour-wage for debit to production.

19. A machine shop has 8 identical machines manned by 6 operators. The machine cannot be worked without an operator wholly engaged on it. The original cost of all these machines workers out to Rs.8 lakhs. These particulars are furnished for a 6 month period :

Normal available hours per month per worker	208
Absenteeism (without pay) hours P.M. per worker	18
Leave (with pay) hours per worker P.M	20
Normal idle time Unavoidable hours per worker P.M.	10
Average rate of wages per worker for 8 hours a day	Rs.20
Average rate of production bonus estimated	15% on wages
Value of Power consumed	Rs.8,050
Supervision and indirect labour	Rs.3,300
Lighting and electricity	Rs.4,200
These particulars are for a year :	
Repairs and maintenance including consumables	3% of value of machines
Insurance	Rs.40,000
Depreciation	10% of original cost
Other sundry works expenses	Rs.12,000
General management expenses allocated	Rs.54,530

You are required to work out a comprehensive machine hour rate for the machine shop.

20. The following particulars refer to process used in the treatment of a material subsequently incorporated in a component forming part of an electrical appliance :

(a) The original cost of the machine used was Rs. 3,10,000. Its estimated life is 10 years, the estimated scrap value at the end of its life is Rs. 31,000, and the estimated working time per year (50 weeks of 44 hours) is 2,200 hours of which machine maintenance, etc., is estimated to take up 120 hours. No other loss of working time is expected, setting up time, estimated at 100 hrs. (included in 2,200 hrs.), is regarded as productive time.

(b) Electricity used by the machine during production is 16 units per hour at a cost of Rs 5 per unit. No current is taken during maintenance or setting up.

(c) The machine requires a chemical solution which is replaced at the end of each week at a cost of Rs. 820 each time.

(d) The estimated cost of maintenance per year is Rs. 71,200.

(e) Two attendants control the operation of the machine together with five other identical machines. Their combined weekly wages, insurance and the employer's contributions to PF & holiday pay amount to Rs. 4,120.

(f) Departmental & general works overheads allocated to this machine for the year amount to Rs. 27,000.

(a) You are required to calculate the machine hour rate necessary to provide for recoupment of the cost of operating the machine.

Continuing the information given above, compute the machine-hour rate, in each of the following cases:

(b) If setting up time is taken as productive time & current require @ 60% of production during setting up.

(c) If setting up time is taken as unproductive time but current is taken during setting up.

(d) If setting up time is taken as unproductive time and no current is taken during setting up time.

21. An Engineering Company engaged in the manufacture of various heavy engineering products, has installed one Pegard Numerical Control Horizontal Borer of specialised manufacturing operations. Calculate the machine hour rate on the basis of the following particulars :

(I) F.O.B. cost of the machine Rs. 24 lakhs
(ii) Customs duty, insurance freight etc. Rs. 11 lakhs.
(iii) Installation expenses Rs. 3 lakhs.
(iv) Cost of tools adequate for 2 years only Rs. 4 lakhs

(v) Cost of machine room Rs. 3 lakhs
(vi) Cost of air-conditioning for machine room Rs. 2 lakhs.
(vii) Rate of interest on term loan to finance the above capital expenditure 12% per annum.
(viii) Salaries, etc. for operators and supervisory staff Rs. 2 lakhs per year

(ix) Cost of electricity Rs. 11 per hour.
(x) Consumption of stores Rs. 5,000 per month
(xi) Other expenses Rs. 5 lakhs per annum.
(xii) Assume rate of depreciation 10% per annum on fixed assets.

(xiii) Total working hours in the machine room are 200 hours in a month.
(xiv) Loading and unloading time is 10% of machine time.
(xv) You can make suitable assumption if necessary for the purpose of your computation.

Dual Rate or Two Tier Machine Hour Rate

22. In a factory there are 2 identical big machines and 4 identical small machines, occupying ¼ th area (big) & 1/8 (small) area. Each big machine employs 3 workers and small one 2 workers. The working hours for big as well as small are 2,000 hours p.a. but their estimated life is 20,000 hrs for big & 15,000 hours for small one respectively. Their respective cost Rs.4,00,000 for big and Rs. 2,00,000 for small the estimated scrap is Rs.20,000 for big & Rs. 14,000 for small machine. Wage rate Rs. 50 per hour.

The estimated cost of repairs is Rs.3,80,000 for both the big machines and Rs. 1,00,000 for each of small machines for the entire life. Power consumed by big machine is 6 units an hour and by small 5 units an hour @ Rs.5 per unit. Manager gets Rs. 8,00,000 p.a. and devotes equally out of his ½ time to all machines. Other charges:-

Rent Rs. 1,60,000 p.a.; Lighting Rs.32,000 p.a.

Insurance per machine : Big Rs.71,900 p.a. Small 42,600 p.a.

Calculate machine hour.

23. AT Ltd. an engineering company having 25 different types of automatic machines, furnishes you the following data for 2008-09 in respect of machine shop. :

1. Cost of the Machine B — Rs. 50,00,000
   Life 10 years — scrap value is nil.

2. Overhead Expenses are :

	Rs.
Factory rent:	4,50,000 p.a.
Heating and Lighting	7,40,000 p.a.
Supervision	11,50,000 p.a.

   Power Cost Rs. 50 per hour while in operation

3. Other information

Reserve Equipment for machine 'B'	35,000 p.a.
Area of the Factory	80,000 Sq. ft.
Area occupied by Machine 'B'	4,000 sq.ft.

4. Wages of operator is Rs. 240 per day of 8 hours including all fringe benefits. He attends to one machine when it is being set up and two machines while under operation.

5. Estimated production hours — 25,600 p.a.
   Estimated set-up time — 2,400 hours p.a.

Prepare schedule of comprehensive machine-hour rate for Machine B and find the cost of the following jobs :

	Job 1102	Job 1308
Set up time (Hours)	80	40
Operation time (Hours)	130	160

Under or Over Recovery

24. A certain cost centre consists of ten workers using similar machines. The normal week consists of 6 days, totaling 48 hour. Each worker earns two weeks annual holidays; each week, 2 hours per operator should be spent in cleaning etc. and it is estimated that illness and absenteeism will cause that loss of 1,000 hours per annum. It is not anticipated that any overtime will be worked or that any time other than that stated will be lost. Overhead allocated and apportioned to the cost centre, which are to be absorbed at a rate per direct labour hour, total Rs. 16,50,000.

During the year, actual overheads amounted to Rs. 17,03,800; time occupied in cleaning etc. totaled 1,100 hours; time lost by illness and absenteeism totaled 1,300 hours; time lost by machine breakdown totaled 200 hours. Overtime worked on production during the period amounted to 800 hours. Calculate the amount of overhead un- absolved.

25. From the following data relating to a production unit, workout the over-absorbed or under-absorbed overhead resulting during the month of review:

The unit having a strength of 20 workmen planned for 290 working days of 8 hours each with half-an-hour break. Based on the earlier years' trend it is forecasted that average absenteeism per workman would be 10 days, in addition to the eligibility of 30 days annual leave.

The budgeted overheads related to the unit for the year amounted to Rs. 75,000 and the unit follows a system of recovering overheads on the basis of direct labor hours.
The actual overheads during the year amounted to Rs. 71,200 and the following details regarding actual working of the unit are available.

(i) The factory worked 3 extra days to meet the production targets, but one additional paid holiday had to be declared.

(ii) There was a service breakdown of a major equipment leading to a loss of 350 man hours.
(iii) Total overtime hours (in addition to extra days worked) amounted to 680 hours.

(iv) The actual average absenteeism per workman was 12 days.

26 PQR manufactures- a small scale enterprise produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The budgeted production overheads of the factory are Rs. 10,08,000 and budgeted machine hours are 96,000.

For a period of first six months of the financial year 2007-08, following information were extracted from the books:

	Rs.
Actual production overheads	6,79,000
Amount included in the production overheads:	
Paid as per court's order	45,000
Expenses of previous year booked in current year	10,000
Paid to workers for strike period under an award	42,000
Obsolete stores written off	18,000
Production and sales data of the concern for the first six months are as under:	
Production:	
Finished goods	22,000 units
WIP (50% complete in every respect)	16,000 units
Sales:	
Finished goods	18,000 units

The actual machine hours worked during the period were 48,000 hrs. it is revealed from the analysis of information that ¼ of the under-absorption was due to defective production policies and the balance was attributable to increase in costs.

You are required:

(i) To determine the amount of under absorption of production overheads for the period.

(ii) To show the accounting treatment of under-absorption of production overheads, and

(iii) To apportion the unabsorbed overheads over the items.

Treatment of Selling & Distribution Overhead:

Selling and distribution expenses are usually collected under separate cost account numbers i.e. codification of overhead.

Selling & Distribution Overhead are apportioned among the products or sales areas on the following basis

Items	Basis of apportionment
Remuneration of salesmen	No. of employees
Commission	Sales value
Advertisement	Sales Value or physical units.
Warehousing expenses	Sales Volume of each product = no.of units × cft p.u.
Rent	Floor Space
Insurance	Value of Finished Stock of each product line.
Depreciation	Percentage of capital value of Assets
Transport	Weight or Volume × Distance travelled.
Credit and collection	Number of sale orders
Financial	Sale value of each product line
General Admn.	No. of sales-men/Sales value
Sales Admin. (including Sales manager's salary)	Sales Value
Misc.,	Sales value or sales volume or units

There is no reapportionment of overhead.
These total costs may be recovered by using any one of following method of recovery.

1. Percentage on selling price.
2. Rate per unit sold.
3. Percentage on cost of production/cost of goods sold.

Then we absorb the selling & distribution overhead in the cost of the job on the basis of the recovery rate as computed above.

27. A company produces a single product in three sizes, A, B, and C. Prepare a statement showing the selling and distribution expenses apportioned over these three sizes applying the appropriate basis for such apportionment in each case from the particulars indicated.

Data available relating to the three sizes are follows :-

		Total	Size A	Size B	Size C
(I)	No. of salesmen, all paid salary	10	4	5	1
(ii)	Units sold	10,400	3,400	4,000	3,000
(iii)	No. of orders	1,600	700	800	100
(iv)	Percentage of specific advertising	100%	30%	40%	30%
(v)	Sales turnover (Rs.)	50,00,000	15,80,000	18,00,000	16,20,000
(vi)	Volume of cft.per unit of finished product	-	5	8	17

Expenses	Amount Rs.	Basis of Apportionment
Sales Salaries	2,10,000	Direct charges
Sales Commission	96,000	Sales turnover
Sales Office expenses	54,800	Number of orders
Advertising : General	65,000	Sales turnover
Advertising : Specific	3,22,000	Direct charge
Packing	53,000	Total volume in cf. of products sold
Delivery expenses	74,000	do
Warehouse expenses	81,000	do
Credit Collection Expenses	96,400	No. of orders.
Sales Manager's Office	2,89,000	

Calculate
1. Cost per unit sold (nearest Rs.)
2. As a % of sales turnover (nearest to two places of decimal)

28. A company is making a study of the relative profitability of the two products – A and B. In addition to direct cost, indirect selling and distribution costs to be allocated between the two products are as under :

	Rs.
Insurance charges for inventory (finished)	78,000
Storage costs	1,40,000
Packing and forwarding charges	7,20,000
Sales salaries	8,50,000
Invoicing costs	4,50,000

Other details are :

		Product A	Product B
Selling price per unit	(Rs.)	500	1,000
Cost per unit (exclusive of indirect selling and distribution costs)	(Rs.)	300	600
Annual sales in units		10,000	8,000
Average inventory	(units)	1,000	800
Number of invoices		2,500	2,000

One unit of product A requires a storage space twice as much as product B. The cost to pack & forward one unit is the same for both the products. Salesmen are paid salary plus commission @ 5% on sales and equal amount of efforts are put forth on the sales of each of the products.

Required :

i. Set up a schedule showing the apportionment of the indirect selling and distribution costs between the two products.

ii. Prepare a statement showing the relative profitability of the two products.

29. XYZ Auto Ltd. Is in the business of selling cars. It also sells insurance and finance as part of its overall business strategy. The following information is available for the company:

	Physical units	Sales value
Sales of Cars	10,000 Cars	Rs. 30,000 lakhs
Sales of Insurance	6,000 Policies	Rs. 1,500 lakhs
Sales of Finance	8,000 Loans	Rs. 19,200 lakhs

The Revenue earnings from each line of business before expenses are as follows:

Sales of Cars	3% of Sales value
Sales of Insurance	20% of Sales value
Sales of Finance	2% of Sales value

The expenses of the Company are as follows:

Salesman salaries	Rs. 200 lakhs
Rent	Rs. 100 lakhs
Electricity	Rs. 100 lakhs
Advertising	Rs. 200 lakhs
Documentation cost per insurance policy	Rs. 100
Documentation cost for each loan	Rs. 200
Direct sales expenses per car	Rs. 5,000

Indirect costs have to be allocated in the ratio of physical units sold.

Required:

(i) Make a cost sheet for each product allocating the direct & indirect costs and also showing the product wise profit & total profit.

(ii) Calculate the percentage of profit to revenue earned from each line of business. May/06/4

Process Costing, Joint & By Product

1. Compare Process Costing with Job Costing.

The main points of comparison between job costing and process costing are as follows :

i. Job costing is applicable to goods produced/manufactured to customers specifications. However, process costing is applicable to production consisting of succession of continuous operations or processes.

ii. Costs are accumulated by a job or work order irrespective of its time of completion under job costing. When a job is finished all costs associated with it are charged to it in full. Whereas under process costing costs are accumulated by processes for a particular period regardless of the number of units produced.

iii. Each job will be different from the other under job costing whereas in the case of process costing units of product are homogenous and indistinguishable, because goods are produced an a mass scale.

iv. Job is normally a single unit, the whole unit is taken as one for process costing purposes.

v. Job costing does not involve transfer of costs from one job to another. Where as in the case of process costing transfer of output from one process to another involves the transfer of its costs as well.

2. What is operation costing ?

It is refinement of process costing. It is concerned with the determination of cost of each operation. It is used those industries where a process consist of distinct operation. It is concerned with the determination of cost of each operation rather than process. It offers scope for computation of unit operation cost at the end of each operation by dividing the total operation cost by total output of units.

Rules for Process costing & Jt. And By- Product

Objective to find the value of main products, their sale price and profit. For this purpose distribute the joint cost among the main products. For this purposes different techniques are available, as discuss in point below.

Joint cost = Total cost up to split off point – (NRV from by-product + scrap of normal loss.)

Every Process A/c is debited with the costs incurred & credited by the losses, transfer, sale & closing stock. Both sides will tally unless the transfer is made at a profit (known as inter profit transfer)

Dr **Process ---- A/C** **Cr.**

Units	Rate	Amt.		Units	Rate	Amt.
To Opening Stock			**By Normal loss**			**Scrap value**
To Transfer from previous process			**By By-product**			
To Material Introduce			**Realisation**			
To Conv. Cost			**By Transfer to next process**			
To Abnormal gain			**By Abnormal Loss**			
			By Closing Stock			

1. **Normal loss or unavoidable loss which is inherent in a process. It is always computed on input material as an estimation. Some times it is also computed on throughput i.e. Opening WIP+ Introduction-Closing WIP.**

   Normal Loss A/c……Dr.
   To Process A/c

2. **Scrap of a process includes both normal & abnormal losses. If the actual scrap is more than the normal loss then the additional scarp quantity is known as abnormal loss.**

   Abnormal loss A/c……Dr.
   To Process A/c

3. **If actual scrap is less than normal loss than the difference is known as abnormal gain. It is a part of good units.**

   Process A/c……Dr.
   To Abnormal gain A/c

4. **Abnormal loss units are sold at the scrap value of the corresponding process.**

   Cash or GLA A/c……..…Dr.
   To Abnormal loss A/c

   The balance of this ledger is transfer to Costing P & L A/c.

5. **Adjust the abnormal gain units with normal loss, as abnormal gain arises due to reduction in normal loss. So, loss of normal scarp realize is the opportunity cost for the Abnormal gain.**

   Abnormal gain A/c……..Dr.
   To Normal loss A/c

   The balance of this ledger is transfer to Costing P & L as abnormal gain

6. **Rest of the normal loss units are realised in cash**

   Cash of GLA A/c …….. Dr.
   To Normal loss A/c

7. **Prepare process stock account after each process, if asks in problem.**

8. **Valuation of transfer units, abnormal gain or abnormal loss .**

   Rate per unit = $\frac{\text{Total Input cost-Scrap value of normal loss \& By product}}{\text{Total units introduced-Normal loss units.\& by-product units}}$

9. **For re-cycle material, the issue rate is the weighted average rate of the virgin or fresh materials of process 1.**

10. **Opening & closing WIP are valued on equivalent production basis. This is computed on the basis of FIFO or Average Basis.**

11. The net realisation from by products are credited to the process a/c.

Net realisation = sale value of by product – profit – further processing cost of by product & selling cost. So, NRV utilized to reduced the joint cost of the main process. This is also known as Reverse cost method.

If the By Product is not further processed then credit the sale value of By product in Process A/c.

12. Apportionment of joint cost among main products

Joint cost = total cost of process or dept. up to split off point or separation point – realisation from normal loss and by product. Joint cost is to be distributed among main process.

Apportionment Rules are :

A. Estimated Net Realizable Value method (NRV).

NRV = Sales value of production after further processing- Further processing cost.

Distributed the joint cost in the ratio of the NRV of Products. If any product is not further processed then it takes at sales value of split off point.

Then prepare a profitability statement as below:-

	Rs.
Share of joint cost ……	xx
At further processing cost……	xx
Cost of production……	xx
Less: Closing value of finished goods & WIP……..	xx
(Apply FIFO method less value of closing finished)	
Add opening finished goods & WIP……..	xx
Cost of Goods Sold……	xx
Add Selling & distribution cost……..	xx
Cost of sales (a)……	xx
Sale value of the product (b)……	xx
Profit (b-a)……	xx

B. Estimated gross profit percentage method on total basis.

GP = sale value of production – total cost.
GP Percentage = Total profit÷Total sale value of production ×100
∴Share of Joint cost = Sale value of production-GP-Further processing cost.

C. Market value (of production) after further process method.

D. Market value (production) at split off point.

E. Physical measurement basis. (out put ratio)

Note: If nothing is mentioned in the problem, always apportion Joint cost in the sale value ratio at split off point.

13. Decision regarding further processing : apply IR vs. DC
14. For any decision making problem , current total profit has to be maintained.

Simple Process

1. RST Ltd. Processes product Z through two distinct process- process I and Process II. On completion, it is transferred to finished stock. From the following information for the year 2008-09, prepare process I, Process II and Finished stock A/c:

Particulars	Process I	Process II
Raw materials used	7,500 units	--
Raw materials cost per unit	Rs. 60	--
Transfer to next process/finished stock	7,050	6,525 units
Normal loss (on inputs)	5%	10%
Direct wages (Rs.)	1,35,750	1,29,250
Direct expenses as a % of direct wages	60%	65%
Manufacturing overheads as a % of direct wages	20%	15%
Realizable value of scrap per unit (Rs.)	12.50	37.50

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-progress.

2. A company manufactures its sole product by passing the raw materials through distinct process in its factory. During the months of April 2009, the company purchased 96,000 kg. of raw materials at Rs. 5 per kg. and introduced the same in process 1. Further particulars of manufacture for the month are given below:-

	Process I	Process II	Process III
Materials consumed	Rs. 33,472	Rs. 27,483	Rs. 47,166
Direct Labour	80,000	72,000	56,000
Overheads	1,20,000	1,08,000	84,000
Normal waste in process as % of input	3%	1%	1%
Sales value of waste (Rs/kg)	2	3	5
Actual output during the month (kg)	93,400	92,200	90,500

Prepare the three process accounts relating to abnormal, loss/gain, if any.

3. The input to a purifying process was 16,000 kgs. of basic material purchased @ Rs.4.20 per Kg. Process wages amounted to Rs.72,000 and overhead was applied @ 240 % of the labour cost. Indirect materials of negligible weight was introduced into the process at a cost of Rs.3,300. The actual output from the process weight 15,000 kgs. The normal yield of the process is 92%. Any difference in weight between the input of basic material and output of purified material (product) is sold @ Re.0.50 per kg.

The process is operated under a license which provides for the payment of royalty @ Re.0.15 per kg. of the purified material produced.

Prepare :

i. Purifying Process Account
ii. Normal Wastage Account
iii. Abnormal Yield Account
iv. Royalty Payable Account.

Treatment of by product (when by product is not processed further):

4. In the course of manufacture of the main Product 'P' by products 'A' and 'B' also emerge. The joint expenses of manufacture amount to Rs. 1,19,550. All the three products are processed further after separation and sold as per details given below :

		Main Product	By-products	
		'P'	'A'	'B'
Sales	Rs.	90,000	60,000	40,000
Costs incurred after separation	Rs.	6,000	5,000	4,000
Profit as percentage on sales		25	20	15

Total fixed selling expenses are 10% of total cost of sales which are apportioned to the three products in the ratio of 20 : 40 :40.

(I) Prepare a statement showing the apportionment of joints costs to the main product and the two by-products.

(ii) If the by-product 'A' is not subjected to further processing and is sold at the points of separation, for which there is a market at Rs. 58,500 without incurring any selling expenses, would you advise its disposal at this stage ? Show the workings.

5. A chemical company produces two fluids jointly in three processes before plunge into the bottle. The processes are as :

Process 1 : Raw materials X & Y are mixed & filtered. There is an evaporation loss of 10%.

Process 2 : The mixture from the process 1 is boiled and thus its volume is reduced by 20%. The remaining liquid distills into 50% process product M, 20% process product N and 25% by product C, the balance 5% is normal loss.

Process 3 : The raw material Z, 8,000 litres is boiled with entire transfer of process product M, and finished product A is obtained Similarly, the raw material Z 1,000 litres, is blended with entire transfer of process product N and the finished product B is obtained. There is no weight loss in this process.

The particulars for operating in a particular month:

1. Raw materials

Raw materials	Input litters	Rates per litter (Rs.)
X	25,000	2
Y	25,000	5
Z	9,000	20

2. Conversion costs per litre of input processed

Process	Direct Wage Rs.	Variable overhead Rs.	Fixed overhead p.m. Rs.
1	0.50	0.20	10,000
2	0.75	1.00	30,000
3	1.00	0.50	15,000

The fixed overhead in the process 3 is apportioned 2 : 1 ratio A & B. There are no stocks in the process.

3. By product is sold @ Rs. 0.75 per liter.

Tabulate individual process and compute unit costs of products A and B.

Treatment of by product (when by product is processed further):

6. Product ZENU is made by three sequential process, I, II and III. In process III a by-product arises and after further processing in process XY, at a cost of Rs. 2 per unit, by-product 'XYZ' is produced. Selling and distribution expenses of Re.1 per unit are incurred in marketing 'XYZ' at a selling price of Rs. 9 per unit.

	Process I	Process II	Process III
Normal loss	10%	5%	10%
Scrap value p.u	Re. 1	Rs. 3	Rs. 5

For the month of April 2009 the following :

	Process I	Process II	Process III	Process XY
Output , in units	8,800	8,400	7,000	420 of XYZ
Costs	Rs.	Rs.	Rs.	Total Rs.
Direct Materials Introduced (10,000 units)	20,000			20,000
Direct materials added	6,000	12,640	23,200	41,840
Direct Wages	5,000	6,000	10,000	21,000
Direct Expenses	4,000	6,200	4,080	14,280

Budgeted production overhead for the month was Rs. 84,000. Absorption is based on a percentage of direct wages. There are no stocks at the beginning or end of the month.

You are required, using the information given, to prepare accounts for :
(a) each of process I, II and III ; (b) process XY.

7. A factory is engaged in the production of chemical BOMEX and in the course of its manufacture, a by-product. Brucil is produced, which after further processing has a commercial value. For the month of April 2009, the following are the summarised cost data :-

		Separate Expenses of	
	Joint Expenses	Bomex	Berucil
	Rs.	Rs.	Rs.
Materials	1,00,000	6,000	4,000
Labour	50,000	20,000	18,000
Overheads	30,000	10,000	6,000
Selling price per unit		98	34
Estimated profit p.u.			4
No. of units produced		2,000	2,000

The factory uses reverse cost method of accounting for by-products.

You are required to prepare statements showing :
(i) The joint cost allocable to Bomex.
(ii) The product wise and overall profitability of the factory for April, 2009.

When by-product is valued separately:

8. The yield of a certain process is 80% as to the main product, 15% as to the by-product and 5% to the process loss. The material put in process (5,000 units) cost Rs. 23.75 per unit and all other charges are Rs. 14,250 of which power cost accounted for 33 1/3%. it is ascertained that power is chargeable as to the main product and by-product in the ratio of 10 : 9. Draw up a statement showing the cost of the by-product.

Identification of input mix:

9. Raw materials, 'AXE' costing Rs. 150 per kg and 'BXE' costing Rs. 90 per kg. are mixed in equal proportions for making product 'A'. The loss of material in processing works out to 25% of the product. The production expenses are allocated at 40% of direct material cost. The end product is priced with a margin of 20% over the total cost.

Material 'BXE' is not easily available and substitute raw material 'CXE' has been found for 'BXE' costing Rs. 75 per kg. It is required to keep the proportion of this substitute material in the mixture as low as possible and at the same time maintain the selling price of the end product at existing level and ensure the same quantum of profit at present.

You are required to compute the ratio of the mix of the raw materials 'AXE' and 'CXE'.

Computation of missing figure;

10. A product passes through three process -- A, B and C 10,000 units at a cost of Rs. 2.30 were issued to process A. The other direct expenses were as follows :

	Process A	Process B	Process C
Sundry materials (Rs.)	1,500	1,500	1,500
Direct Labour	4,500	8,000	6,500
Direct expenses	1,000	1,000	1,503

The overhead charges were 160% of direct labour. The final product was sold at Rs. 14 per unit fetching a profit of 20% on cost. Find out the percentage of wastage in process C.

The wastage of process A was 5% and in process B 4%. The wastage of process A was sold at Re. 0.25 per unit and that of B at Re. 0.50 per unit and that of C at Rs. 2 per unit.

Apportion & Treatment of Joint Cost :

11. KARR Chemicals Ltd. electrolyses common salt to obtain three joint products-caustic soda, chlorine and hydrogen. During a costing period, the expenditure relating to the inputs for the common process amounted to Rs. 3,50,000. After-separation expenses amounting to Rs. 1,60,000, Rs. 75,000, and Rs. 10,000 were incurred for caustic soda, chlorine and hydrogen respectively. The entire production was sold and Rs. 3,75,000 Rs. 2,50,000, and Rs. 60,000 were realised for caustic soda, chlorine and hydrogen respectively. The selling expenses were estimated at 5% of realisations from sale. The management expected profits @ 15%; 10% and 5% of realisations from sale of caustic soda, chlorine and hydrogen respectively.
Draw a columnar statement showing the apportionment of joint costs & profit of each product.

12. In a Oil Mill four products emerge from a refining process. The total cost of input during the quarter ending March, 2009 is Rs. 1,44,000. The output, sales and additional processing costs are as under :

Products	Output in litres	Additional processing costs after split-off point	Total value of qty. sold	Qty. sold
A	8,000	Rs. 43,000	Rs.1,76,000	8,000
B	4,000	9,000	16,000	3,200
C	2,000	--	6,000	2,000
D	4,000	1,500	45,000	3,000

In case these products were disposed of at the split-off point, the selling price would have been :

	A	B	C	D
Rs.	15.00	6.00	3.00	7.50

Prepare a statement of profitability based on :

(a) If the products are sold after further processing is carried out in the mills.
(b) It they are sold at the split-off point. (Sale Qty. remain same)

(c) Find the maximum profitable product mix.
(d) What will be share of joint cost if it distributes on the basis of sale value after further processing following the answer as in (c) ?

13. A company processes a raw material into five products. In Process 1, Products AXE and BXE are produced in 1 :1 ratio. Product AXE then passes on to process 2 where it is processed into CXE and DXE. Product BXE is used in process 3 to produce the product EXE.

Product AXE yields products CXE and DXE in the ratio of 7 :3. CXE is processed further in Process 4 after which it is sold for Rs. 18 per unit. DXE may be sold immediately at Rs. 15 per unit or it may be processed further in Process 5 after which it can be sold for Rs. 20.80 per unit.

EXE is processed in Process 6 where normal spoilage of 5% occurs. The spoiled units are disposed of at a price of Rs. 2 per unit. EXE sells at Rs. 16 per unit.

The costs incurred during a period are as under:-

Process	Output units	Costs Rs.
1	1,00,000	5,41,500
2	50,000	1,50,000
3	50,000	1,08,000
4	35,000	1,30,000
5	15,000	1,00,000
6	47,500	97,000

The output of Process 6 represents goods units. The process costs are variable costs.

Required:
(i) Prepare a Statement showing the apportionment of joint costs to Products AXE and BXE and products CXE and DXE.

(ii) State with supporting calculation whether the product DXE should be processed in Process 5 or not.

(ii) Prepare a Statement of profit for the period based on your decision at (ii) above.

14. Rayman Company produces three chemical products, JIX, J2Y and B1Z. Raw materials are processed in a single plant to produce two intermediate products J1 & J2. Product J1 is passed through process X to produce product J1X. Product J2 is converted into J2Y by a separate finishing process Y. The Y finishing process produces both J2Y and waste materials, B1, which has no market value. The Rayman Company can convert B1, after additional processing through process Z, into a saleable by – product, B1Z. The company can sell as much B1Z as it can produce at a price of Rs. 1.50 per kg.

At normal levels of production and sales, 6,00,000 kg of the common input materials are processed each month. There are 4,40,000 kg and 1,10,000 kg respectively, of the intermediate products J1 and J2, produced from this level of input. After the separate finishing processes, fixed proportions of J1X, J2Y and B1Z emerge, as shown below with current market prices (all losses are normal losses):

Product	Quantity kg.	Market price per kg.
J1X	4,00,000	Rs. 3
J2Y	1,00,000	Rs. 5
B1Z	10,000	Rs. 1.5

At these normal volumes, materials and processing costs are as follows:

	Common Cost	Separate Finishing processes		
		X	Y	Z
	(Rs. 000)	(Rs.000)	(Rs. 000)	(Rs. 000)
Direct materials	320	110	15	1.0
Direct labour	150	225	90	5.5
Variable overhead	30	50	25	0.5
Fixed overhead	50	25	5	3.0
Total	550	410	135	10.0

Selling and administrative costs are entirely fixed and cannot be traced to any of the three products. All losses are normal losses.

(a) calculate the cost per Kg of the finished products J1X & J2Y and the total manufacturing profit, for the month, attributed to each product assuming all joint costs are allocated based on: (i) Physical units (ii) Net realizable value

(b) A new customer has approached Rayman wishing to purchase 10,000 kg of J2Y for Rs. 4.00 per kg. this is extra to the present level of business indicated above. Advise the management how they may respond to this approach.

INPUT-OUTPUT RATIO & APPLICATION OF MULTIPLIER :

15. A product is finished in three stages I, II, III. At the first stage a quantity of 72,000 kg. was delivered at a cost of Rs. 2.50 per kg. The entire material was consumed. The production particulars along with the allocated expenses were as indicated in the table below :

State	Input	Output	Direct wages	Fixed overhead	Varying Overhead
	Kg.	Kg.	Rs.	%(on direct wages)	%
I	72,000	67,680	7,500	150	200
II	65,000	60,125	12,000	125	150
III	55,600	50,000	14,500	200	250

The producer, as was his usual practice assessed his cost at Rs. 6.77 per kg., based on his output on his input expenditure and the finished output. With a selling price of Rs. 7.50 per kg. he estimated his profit at Rs. 36,500/-. If you do not approve of his assessment of the end results of the operation, convince him of the real end results in a tabular form. You should assume the normal wastage as only 5% on input at each stage and any excess wastage should not be allowed to inflate the cost of the end product.

16. In a manufacturing company, a product passes through 5 operations. The output of the 5th operation becomes the finished product. The input rejection, output and labour and overheads of each operation for a period are as under :

Operation	Input (units)	Rejection (units)	Output (units)	Labour and Overhead (Rs.)
1	21,600	5,400	16,200	1,94,400
2	20,250	1,350	18,900	1,41,750
3	18,900	1,350	17,550	2,45,700
4	23,400	1,800	21,600	1,40,400
5	17,280	2,880	14,400	86,400

You are required to :

a. Determine the input required in each operation for one unit of final output.

b. Calculate the labour and overhead cost at each operation for one unit of final output and

c. the total labour and overhead cost of all operations for one unit of final output.

EQUIVALENT PRODUCTION FIFO BASIS:

17. The product manufactured by a light engineering factory undergoes two operations. The following data are available relating to expenses incurred on production during November, 2009;

	Machining	Finishing
Units as input	90,000	60,000
Expenses incurred in Process	Rs.	Rs.
Direct Material	2,70,000	Nil
Direct Labour	1,28,000	45,000
Overheads	64,000	1,35,000

At the end of the month there were 30,000 units lying incomplete in Machining Operation. While the full quantity of materials had been consumed for the total production, the expenditure on Labour and Overheads was estimated to be 66 2/3% in respect of the incomplete products.

You are required to prepare a detailed Cost Statement showing the final cost per unit assuming ;

(I) Completed units of Machining Operations are transferred to the Finishing Operation ;

(ii) Finishing Operation has completed all the units received from the earlier operation during November 2009, leaving no work-in-progress at the end of the month.

18. The following data are available in respect of Process I for February 2009 :

(1) Opening stock of work in process : 800 units at a total cost of Rs. 4,000.

(2) Degree of completion of opening work in process :

Materials 100%;
Labour 60%;
Overheads 60%;

(3) Input of materials at a total cost of Rs. 36,800 for 9,200 units.
(4) Direct wages incurred Rs. 16,740.
(5) Production overhead Rs. 8,370.

(6) Units scrapped 1,200 units. The stage of completion of these units was :

Materials	100%
Labour	80%
Overheads	80%

(7) Closing work in process : 900 units. The state of completion of these units was :

Materials	100%
Labour	70%
Overheads	70%

(8) 7,900 units were completed and transferred to the next process.

(9) Normal loss is 8% of the total input (opening stock plus units put in).
(10) Scrap value is Rs. 4 per unit.

You are required to show the Process Account for February, 2009 on FIFO basis.

19. RST Ltd. Manufactures plastic moulded chairs. Three models of moulded chairs, all variation of the same design are Standard, Deluxe and Executive. The company uses an operation-costing system.

RST Ltd. Has extrusion, form, trim and finish operations. Plastic sheets are moulded into chair seats and the legs are added. The standard model is sold after this operation.

During the trim operation, the arms are added to the Deluxe and Executive models and the chair edges are smoothed. Only the Executive model enters the finish operation, in which padding is added. All of the units produced receive the same steps within each operation. In April.2009 units of production and direct material cost incurred are as follows:

	Units Produced	Extrusion Materials (Rs.)	Form Materials (Rs.)	Trim Materials (Rs.)	Finish Materials (Rs.)
Standard Model	10,500	1,26,000	42,000	0	0
Deluxe Model	5,250	63,000	21,000	15,750	0
Executive Model	3,500	42,000	14,000	10,500	21,000
	19,250	2,31,000	77,000	26,250	21,000

The total conversion costs for the month of April, 2009 are:

	Extrusion Operation	Form Operation	Trim Operation	Finish Operations
Total Conversion Cost	Rs.6,06,375	Rs.3,08,000	Rs.1,57,500	Rs.94,500

Required:

a. For each product produced by RST Ltd. during April'09, determine the unit cost & the total cost.

b. Now consider the following information for May. All unit costs in May are identical to the April unit costs calculated as above in (a). At the end of May, 1,500 units of the Deluxe model remain in WIP. These units are 100% complete as to materials and 65% complete in the trim operation. Determine the cost of the Deluxe model WIP inventory at the end of May.

Equivalent Production – Average Method:

20. The in-process inventory in process No. 2 at the beginning of a period was valued at Rs. 2,950/- made up of Rs. 1,400/- towards materials, Rs. 1,000/- towards labour & Rs. 550/- towards overheads for 100 units.

The value added during the period was Rs. 53,600/- towards an introduction of 4,100 units from the previous process besides Rs. 40,800/- towards labour and Rs. 19,400/- towards overheads. Out of 3,600 units completed 3,300 units were transferred to the next process leaving the balance in stock. 400 units were held back in process with half completion towards labour and overheads while 200 units were loss in processing considered normal and hence should be borne by the entire inventory.
Prepare a cost of production statement using average cost basis.

21. Following information is available regarding process A for the month of February, 2009 :
Production Record

Units in process as on 1/2/ 2009	4,000
(All materials used, 25% complete for labour and overhead)	
New units introduced	16,000
Units completed	14,000
Units in process as on 28/2/ 2009	6,000
All materials 100% used, 33.3333% complete for labour and overhead.	

Cost Records:

	Rs.
Work-in-process as on 1/2/ 2009	
Materials	6,000
Labour	1,000
Overhead	1,000
	8,000
Cost during month	
Materials	25,600
Labour	15,000
Overhead	15,000
	55,600

Prepare :
1. Statement of equivalent production. 2. Statement showing cost for each element.
3. Statement of apportionment of cost. 4. Process cost account for process A.

22. Component X is made by one engineering company on a continuous basis. The following data are available :

1. Material is put into operation at the start of process.
2. Conversion cost is evenly incurred during the manufacturing period.
3. The inspection is carried out at the end of the operation
4. Normal loss is equal to 5% of the good output & is absorbed in the cost of output, transferred to finished stock.
5. W.I.P. at the beginning of the month was 240 units, 1/3 completed, material Rs. 2,410, conversion cost Rs. 1,710.
6. During the month, 10,000 units were introduced . Cost incurred, Material Rs. 89,750, Conversion cost Rs. 1,08,000 ; 8,000 units were passed by inspection and transferred to the finished stock warehouse.
7. At the month end, WIP consisted of:- 1,000 units, each ½ completed & 300 units each 1/3 completed.
8. The balance units had a scrap value of Rs. 5 p.u.

Provide an operating cost statement. The Average method is applied.

EQ - TWO MATERIALS

23. The following data are available in respect of process 3 for the month of April :

			Rs.('000)
Direct materials added in process			776
Direct labour			398
Production overhead			768
Transfer from Process 2	:	4,200 units valued at	1,560
Transfer to Process 4	:	3,650 units	
Stock at 1st April :		600 units valued at	390

Degree of completion ;Materials added in process 60% ; Labour 30% ; Overhead 40%

Stock at 30th April : 800 units

Degree of completion :Materials added in process 80%; Labour 70% ; Overhead 60%
Units scrapped : Actual 350

Degree of completion :Materials added in process 100% ; Labour 80% ; Overhead 80%

Normal loss is 10% of throughput. All units scrapped can be sold for Rs. 100 per unit,
You are required to show the necessary accounts .

INTER – PROCESS PROFIT :

24. A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October, 2009 :

	Process		Finished Stock
Particulars	I	II	
Opening Stock	Rs.7,500	Rs. 9,000	Rs.22,500
Direct materials	15,000	15,750	
Direct Wages	11,200	11,250	
Factory overheads	10,500	4,500	
Closing Stock	3,700	4,500	11,250
Inter-process profit included in opening stock		1,500	8,250

Output of process I is transferred to process II at 25% profit on the transfer price.

Output of process II is transferred to finished stock at 20% profit on the transfer price. Stocks in process are valued at prime cost . Finished stock is valued at the price at which it is received from process II. Sales during the period is Rs. 1,40,000. Required -- Process cost accounts and finished goods account showing the profit element at each stage.

Process with escalation

25. A product goes through three processes from a single input material. At the end of Process I, an intermediate product, A, which cannot be further processed, also emerges. At the end of Process II, another intermediate product, B, also emerges, which cannot be processed further. The main product results at the end of Process III. The prices of these Products have been frozen by the Government, subject to escalation only for raw material price and labour rate variations. During a period, while the price control was in force, the material cost had gone up by Rs. 15 per kg. and the labour rates increased by Re. 0.80 per labour hour. Given the following information, on inputs and related outputs, you are required to determine the amount of claim for price escalation, for each of the intermediary products A , B the main product and the total claim:-

	Input kg.	Output kg.	Labour Hours
Process I	2,000	1,600	16,000
Process II	1,440	1,200	18,000
Process III	880	800	16,000

Decision Making on Process Costing :

26. A Chemical Company carries on production operation in two processes. The material first pass through Process I, where Product 'A' is produced.

Following data are given for the month just ended:

Material input quantity	2,00,000	kgs.
Opening WIP quantity (Material 100% & conversion 50% complete)	40,000	kgs.
Work completed quantity	1,60,000	kgs.
Closing WIP quantity (Material 100% & conversion 2/3 complete)	30,000	kgs.
Material input cost	Rs. 75,000	
Processing cost	Rs. 1,02,000	
Opening WIP cost:		
Material cost	Rs. 20,000	
Processing cost	Rs. 12,000	

Normal process loss in quantity may be assumed to be 20% of material input. It has no realizable value.

Any quantity of product 'A' can be sold for Rs. 1.60 per kg. Alternatively, it can be transferred to Process II for further processing & then sold as product 'AX' for Rs. 2 p. kg. Further materials are added in Process II, which yield two kgs of product 'AX' for every kg. of product 'A' of Process I.

Of the 1,60,000 kgs. per month of work completed in process I, 40,000 kgs. are sold as product 'A' and1,20,000 kgs. are passed through Process II for sale as product 'AX'. Process II has facilities to handle up to 1,60,000 kgs. of product 'A' per month, if required.

The monthly costs incurred in process II (other than the cost of product 'A') are:

	1,20,000 kgs. Of product 'A' Input	1,60,000 kgs. of product 'A' input
Material costs	Rs. 1,32,000	Rs. 1,76,000
Processing cots	Rs. 1,20,000	Rs. 1,40,000

Required:

i) Determine, using the weighted average cost method, the cost per kg. of product 'A' in process I and value of both work completed and closing WIP for the month just ended.

ii) Is it processing 1,20,000 kgs. of product 'A' further?

iii) Calculate the minimum acceptable selling price per kg. if a potential buyer could be found for additional output of product 'AX' that could be produced with the remaining product 'A' quantity.

Contract Costing

1. Features of Contract.

(i) The major part of the work in connection with each contract is ordinarily carried out at the site of the contract.ee/Customer

(ii) The bulk of the expenses incurred by the contractor are considered as direct.

(iii) The indirect expenses, mostly consist of office expenses of the yards, stores and works.

(iv) A separate account is usually maintained for each contract.

(v) The number of contracts undertaken by a contractor at a time is not usually very large.

(vi) The Production unit or output in contract costing is one unit.

2. Main features of 'Cost-Plus-Contracts'.

1. This method is adopted in the case of those contracts where the probable cost of the contract can not be ascertained in advance with a reasonable accuracy.
2. These contracts are preferred when the cost of material and labour is not steady and the contract completion may take number of years.
3. The different costs to be included in the execution of the contract are mutually agreed, so that no dispute may arise in future in this respect. Under such type of contracts contractee is allowed to check or utilization the concerned books, documents and accounts.
4. Such a contract offers a fair price to the contractee & also a reasonable profit to the contractor.
5. The contract price here is ascertained by adding a fixed and mutually pre-decided component of profit to the total cost of the work.

3. Escalation Clause.

This clause is usually provided in the contract as a safeguard against any like changes in the price or utilization of material and labour. If during the period of execution of a contract, the price of materials or labour rise beyond a certain limit, the contract price will be increased by an agreed amount. Inclusion of such a term in a contract deed is known as an 'escalation clause'.

An escalation clause usually relates to change in price of inputs, it may also be extended to increased consumption or utilization of quantities of materials, labour etc. In such a situation the contractor has to satisfy the contract that the increased utilization is not due to his inefficiency

4. Sub – contracting:

It is a common business practice followed by business concerns, under which operations requiring special processing are sub – contracted. Examples of such operations are painting, cutting, stitching etc. this is done due to following reasons:

(i) The operations which are given to outside sub – contractors are those operations which requires the use of special skill or special equipment which is not available with the concern.

(ii) If the management of a concern intends to engage available labour hours and machine hours for operations which require special skill or special facility available with the concern .

(iii) If there is temporary increase in demand of product of a concern some of the operations are given to outsiders to bridge the imbalance between the production capacities. The payment made to sub – contractor or outsiders are charged as direct expenses of the specific jobs/ work orders.

In the books of Contractor
Proforma of a Contract (… no.) A/c for the period ended

Dr. Particulars	Rs.	Rs	Particulars	Rs.	Cr.
Year 1					
To Materials Purchased at site		xx			
" Materials transfer by HO		xx	By Material transfer		xx
" Mat. Received from other job		xx	" Cost of Materials Loss		xx
" Direct Labour		xx	" Closing Stock of Materials at site		xx
" Expenses & Overhead		xx			
" Cost of sub-contract		xx			
" Special plant (100% depn)		xx	" Cost to date or cost of Production c/d		xx
" Depreciation of Machinery		xx	or Cost of work done		….
		xx			**xx**
To Cost of Production b/d		xx	By Work certified		xx
" Notional Profit C/d		xx	" Works un-certified		xx
			" Escalation due price increase		xx
		xx			xx
To P/L A/c		xx	" Notional Profit b/d		xx
Profit Transferred (See Note)					
" Profit Reserve		xx			
Year 2					
To Work certified		xx	By, Contractee a/c		contract price
(-) profit Reserve		xx	if the work is completed		
Cost of sales		xx			
To, Work un certified		xx			
To, Op. Stock of Materials		xx			

Note 1: Work certified means the work completed & certified by the contractee or its agent.
= Contract price × DOC%

Note 2: COS = Work Certified - Profit Reserve.

Note 3: Work un certified means : (a) Work completed but not yet certified.
(b) Semi finished works.

Note 4: Cash Received ÷ Work Certified is also known as "Cash Basis".

Note 5: In case of notional loss, transferred total amount of loss to P/L A/c.

Note 6: in case of profit , compute
Degree of Completion = {(Works certified ÷ Value of the contract price) × 100}

Note-7: computation of profit to be transfer to P &L a/c

Degree of completion	Profit to be transferred to Costing P&L a/c
Below 25%	NIL
25% to below 50%	1/3 x Notional profit x $\frac{\text{cash Received}}{\text{Work certified}}$
50% & above	2/3 x Notional profit x $\frac{\text{cash Received}}{\text{Work certified}}$
Data of Estimated Profit is given (irrespective of degree of completion)	Estimated Profit x $\frac{\text{work certified}}{\text{Contract price}}$ x $\frac{\text{cash Received}}{\text{work certified}}$

Note 8: computation of estimated profit

Statement of Estimated Profit

	Rs.	Rs.
Contract price		×
Less : Cost to date or COWD	×	
Estimated cost to complete the contract (Including opening material)	×	
Contingencies	×	×
Estimated profit		×

1. In case of estimated loss –but notional profit, no profit will be transferred to P & L a/c
2. In case of estimated loss –but there is notional loss, transfer the notional loss
3. If the profit transfer to P & L following Estimated Profit is more than the notional profit, then compute the profit to be transferred to P & L a/c on the basis of DOC.

Note 9: Escalation Clause.

1. On rate basis, escalation amount = Σ (Actual rate –Budgeted rate)×Budgeted input.
2. On cost basis

Actual cost of input consume …..xx
Less: Budgeted cost……..xx
Gross Escalation…….. xx
Less: Standard deduction……xx
Allowable escalation……..Xx

$\therefore$ Escalation amount = Allowable amount×% given in the problem.

PROBLEMS

1. A contractor, who prepares his account on 31st December each year, commenced a contract on 1st April, 2009. The costing records concerning the said contract reveal the following information on 31st December, 2009 :

Materials charged to site	Rs.2,58,100
Labour engaged	5,60,500
Foremen's salary	79,300

Plants costing Rs. 2,60,000 had been on site for 146 days. Depreciation is charged on time basis. Their working life is estimated at 7 years and their final scrap value at Rs. 15,000.

A supervisor, who is paid Rs. 4,000 p.m. has devoted approximately three-fourths of his time to this contract. The administrative and other expenses amount to Rs. 1,40,000.

Materials in hand at site on 31st December, 2009 cost Rs. 25,400. Some of the materials costing Rs. 4,500 was found unsuitable and was sold for Rs. 4,000 and a part of the plant costing Rs. 5,500 (on 31.12. 09) unsuited to the contract was sold at a profit of Rs. 1,000.

Cost of sub-contract Rs7,500. Material transfer to another contract Rs. 12,500.

The contract price was Rs. 22,00,000 but it was accepted by the contractor for Rs. 20,00,000

On 31st December, 2009, two thirds of the contract was completed. Architect's certificate had been issued covering 50% of the contract price and Rs. 7,50,000 had so far been paid on account.

Prepare contract account and state how much profit or loss should be included in the financial accounts to 31st December, 2009. Workings should be clearly given. Also prepare the Contractee's account and show Balance Sheet as on 31st December, 2009.

2. The following information relates to a building contract for Rs. 10,00,000 and for which 80% of the value of work-in-Progress as certified by the architect is being paid by the contractee:-

	2007 Rs.	2008 Rs.	2009 Rs.
Materials issued	1,20,000	1,45,000	84,000
Direct wages	1,10,000	1,55,000	1,10,000
Direct expenses	5,000	17,000	6,000
Indirect expenses	2,000	2,600	500
Work certified 31st Dec. for the year	2,35,000	5,15,000	2,50,000
Work done but not certified	2,800	8,000	Nil
Materials on site	2,000	5,000	8,000
Value of plant issued	14,000	Nil	Nil
The value of plant at the end of the yr	11,200	7,000	3,000
Special plant used in each year	4,900	3,200	…

Prepare Contract Account for the three years taking into account such profit as you think proper on incomplete contract.

Estimated profit basis

3. A construction company undertaking a number of contracts, furnished the following data relating to its uncompleted contracts as on 31st March, 2009 : (Rs. In lakhs)

	Contract Numbers			
	723	726	729	731
Total Contract Price	23.20	14.40	10.08	28.80
Estimated Cost on completion of contract	20.50	11.52	12.60	21.60
Expenses for the year ended 31/3/09 :				
Direct Materials	5.22	1.80	1.98	0.80
Direct Wages	2.32	4.32	3.90	2.16
Overheads (Excluding Depreciation)	1.06	2.60	2.62	1.05
Profit Reserve as on 1/4/08	0.75	--	--	--
Plant issued at Cost	5.00	3.50	2.75	3.00
Materials at Site on 1/4/08	0.75	--	--	--
Materials at Site on 31/3/09	0.45	0.20	0.08	0.05
Work Certified till 31/3/08	4.65	--	--	--
Work Certified during the year 2008-09	12.76	13.26	7.56	4.32
Work Uncertified as on 31/3/09	0.84	0.24	0.14	0.18
Progress payments received during the year	9.57	9.00	5.75	3.60

Depreciation @ 20% p.a. is to be charged on plant issued. While the Contract No. 723 was carried over from last year, the remaining contracts were started in the 1st week of April, 2008

Required :

(i) Determine the profit/loss in respect of each contract for the year ended 31st March, 2009.

(ii) State the profit/loss to be carried to P/L A/c for the year ended 31st March, 2009.

4. Rex Limited commenced a contract on 1.7.2008. The total contract price was Rs. 7,00,000 but Rex Limited accepted the same for Rs. 6,50,000. It was decided to estimate the total profit and to take to the credit of profits and loss account that proportion of estimated profit on cash basis which the work completed bore to the total contract. Actual Expenditure till 31.12.2008 and estimated expenditure in 2009 are given below :-

Expenses	Actual Till 31.12.08(Rs.)	Estimate for 2009(Rs.)
Materials	1,75,000	1,30,000
Labour : Paid	55,000	60,000
: Outstanding at end	20,000	30,000
Plant Purchased (original cost)	40,000	-
Misc. Expenses : Paid	20,000	35,500
: Prepaid at end	2,000	--
Plant Returned to Stores at original cost on		
31.12.08	10,000	-
30.09.09	-	25,000
Materials at Site	5,000	Nil
Work Certified	3,00,000	Full
Cash Received	2,25,000	Full

Included in the above summary of actual entries are wages Rs. 12,000 and other expenses Rs. 8,500, since certification .The value of materials used since certification is Rs. 72,200.

The Plant is subject to annual depreciation @ 10% of original cost. The contract is likely to complete on 30.9.2009. Contingency 2% of total cost.

You are required to prepare the contract account for the year ended 31.12.08. Workings should be clearly given. It is the policy of the company to charge depreciation on time basis.

5. Kanpur Engineering Company undertakes long term contract which involves the fabrication of pressured concrete blocks and the erection of the same on consumer's site.

The following information is supplied regarding the contract which is incomplete on 31st March, 09

Cost incurred :	
Fabrication cost to date –	Rs.
Direct Materials	2,80,000
Direct Labour	90,000
Overheads	75,000
	4,45,000
Erection cost to date	15,000
Total	4,60,000
Contract price	8,19,000
Cash received on account	6,00,000

Technical estimate of work completed to date:

Fabrication :	
Direct Materials	80%
Direct Labour and Overheads	75%
Erection	25%

You are required to prepare a statement for submission to the management indicating: (a) the estimated profit on the completion of the contract. (b) The estimated profit to date on the contract.

6. One of the building contracts currently engaged in by a construction company commenced 15 months ago and remain unfinished. The following information relating to the work on the contract has been prepared for the year just ended :

	Rs. '000
Contract Price	2,500
Value of work certified at the end of year	2,200
Cost of work not yet certified at the end of year	40
Cost incurred :	
Opening balances :	
Cost of work completed	300
Materials on site (physical stock)	10
During the year :	
Materials delivered to site	610
Wages	580
Hire of plant	110
Other expenses	90
Closing balance :	
Materials on site (physical stock)	20

As soon as materials are delivered to the site, they are charged to the contract account. A record is also kept of materials as they are actually used on the contract. Periodically a stock check is made and any discrepancy between book stock and physical stock is transferred to a general contract material discrepancy account. This is absorbed back to each contract, currently at the rate of 0.5% of materials booked. The stock check at the year end revealed a stock shortage of Rs.5,000.

In addition to the direct charges listed above, general overheads are charged to contracts at 5% of the value of work certified. General overheads of Rs.15,000 had been absorbed into the cost of work completed at the beginning of the year.

It has been estimated that further costs to complete the contract will be Rs.2,20,000. This estimate includes the cost of materials on site at the end of the year just finished and also a provision rectification. Cash received is 80% of work certified.

Required :

(a) Explain briefly the distinguishing features of contract costing.

(e) Determine the profitability of the above contract and recommend how much profit (to the nearest Rs.'000) should be taken for the year just ended. (Provide a detailed scheme of costs.)

(c) State how your recommendation in (b) would be affected if the price was Rs.40,00,000 (rather than Rs.25,00,000) and if no estimate has been made of costs to completion. (If required, suitable assumption should be made by the candidate.)

Escalation Clause

7. A contractor has entered into a long-term contract at an agreed price of Rs.15,00,000 subject to an escalation clause for materials and wages. The standard requirements of materials and wages as spelt out in the contract and corresponding actual are as follows:

Materials:	Standard	Actual
A	5000 kgs. @ Rs. 50	5050 kgs. @ Rs. 48
B	3500 kgs @ Rs. 80	3450 kgs. @ Rs. 82
C	2500 kgs. @ Rs. 60	2600 Lts. @ Rs. 74
Wages:		
P	2000 Hrs. @ Rs. 70	2100 Hrs. @ Rs. 72
Q	2500 Hrs. @ Rs. 75	2450 Hrs. @ Rs. 75
R	3000 Hrs. @ Rs. 65	3100 Hrs. @ Rs. 69

Reckoning the full actual consumption of materials and wages the company has claimed a final price of Rs.16,90,750.

a. Give your analysis of the admissible claim and indicate the final price payable.

b. Find the profit of the contractor following this escalation.

c. If 80% of escalation amount is payable by contractee, find the amount payable.

8. Deluxe Ltd. undertook a contract for Rs. 5,00,000/- w.e.f. 1st July, 2008. On 30th June, 2008, when the accounts were closed, the following details relating to the contract were gathered.

Materials purchased	Rs. 1,00,000
Wages paid	45,000
General expenses	10,000
Plant purchased	50,000
Materials at site (on 30th June, 2009)	25,000
Wages accrued (on 30th June, 2009)	5,000
Cash received	1,50,000
Work certified	2,00,000
Work not certified (at cost)	15,000
Depreciation on plant	5,000

The contract contained an escalation clause which read as follows : "In the event of increase in both the material cost and the wage cost by more than 5%, the contract price would increase by 25% of the increase in material cost and 30% in the wage cost beyond 5%".

It was found that, since the date of signing the agreement, the materials cost increased by 20 % and the wage cost increased by 25%. The value of the work certified did not take into account the effect of the escalation clause. Prepare the Contract Account.

10. The escalation clause of a contract runs as under:

You will be allowed escalation on a contract at the net consumption of 50 kg. of steel, 1,000 kg of cement and 80 c.m. of other material per 100 c.m. of Rigid Concrete (R.C) with a margin of 5% in steel, 5% in cement and 12.5% in other material .

The budgeted prices are as: Rs. 6,500 per tonne of steel; Rs. 1,200 per tonne of cement; &Rs. 500 per 100 c.m. of aggregate.

The contract is for 4 lakh c.m. of R.C. and the average price per unit of quantity of materials consumed indicated an increase of 15% in steel, 20% in cement and a decrease of 5% in other material, while the consumption of materials showed an excess of 7.5% of the quantity admissible for each material (exclusive of margin).

Find the amount of escalation on the basis of price as applicable on minimum of Budgeted Qty. or Actual qty.

Cost Control Account

1. Cost Ledger Control Account

This control account is also popularly known as 'General Ledger Adjustment Account' is opened in Cost Ledger to complete double-entry. All items of income and expenditure taken from financial accounts and all transfers from cost accounts to financial books are recorded in this accounts. Since the purpose of this account is to complete double entry in the cost ledger, therefore all transactions in the cost ledger must be recorded through the 'Cost Ledger Control Account'. The balance in this account will always be equal to the total of all the balances of the impersonal accounts.

2. Integrated Accounts.

It is the name given to a system of accounting whereby cost and financial accounts are kept in the same set of books. This system avoids the need for separate sets of books for financial and costing purposes. Integrated accounts provides or meets out fully the information requirement for costing as well as financial accounts. Due to the use of one set of books, there is significant extent of saving in efforts made. No delay is caused in obtaining information as it is provided from books of original entry. The question of reconciling profit & financial profit does not arise, as there is one figure of profit only.

3. Advantages of integrated Accounting :

(i) Since there is one set of accounts, thus there is one figure of profit. Hence the question of reconciliation of costing profit and financial profit does not arise.

(ii) There is no duplication of recording of entries & efforts to maintain separate set of books.

(iii) Costing data are available from books of original entry and hence no delay is caused in obtaining information.

(iv) The operation of the system is facilitated with the use of mechanized accounting.

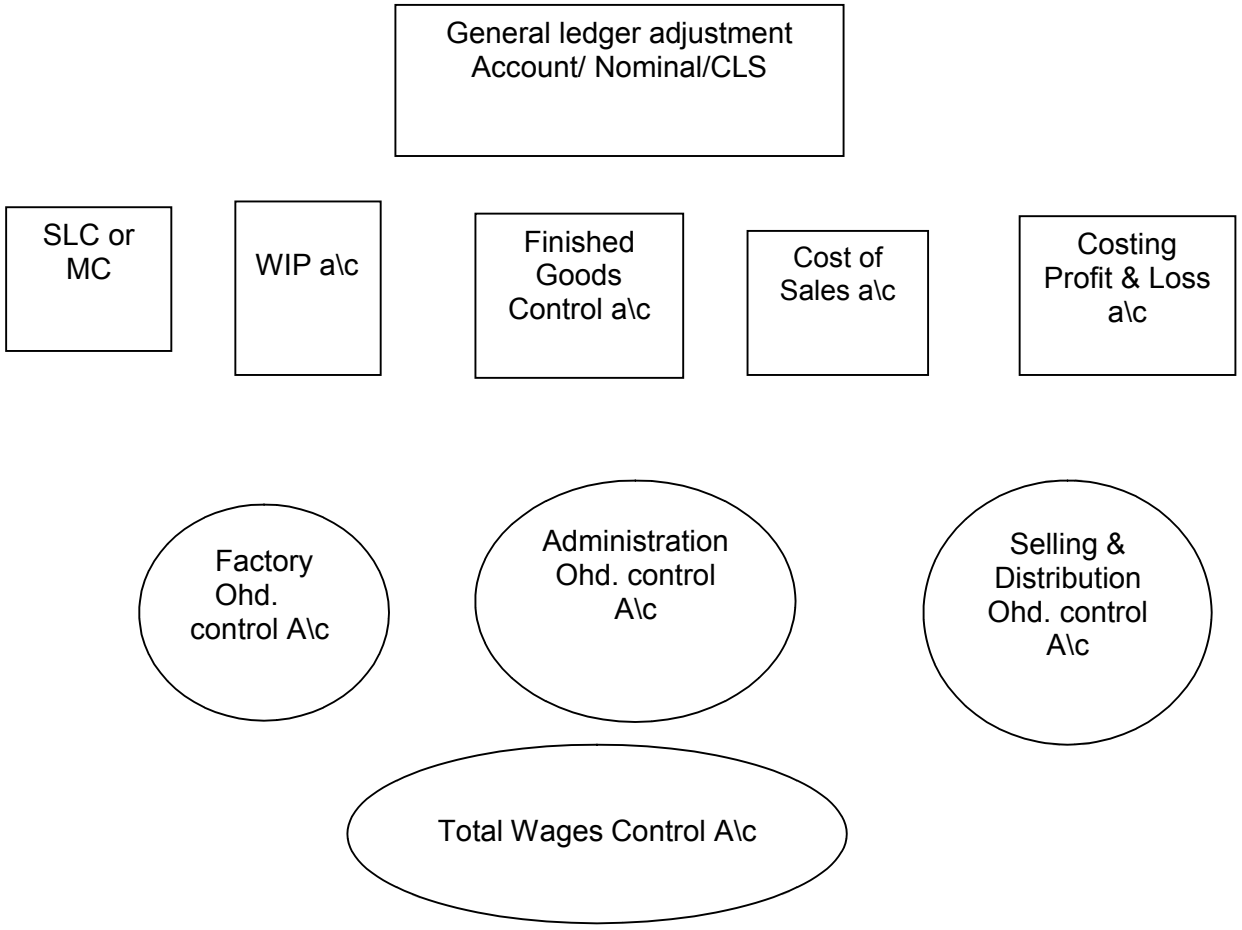
(v) Centralization of accounting function results in economy.

Journal Entries :

	Transaction	Non integral Cost Control A/c.	Integral A/c
1.	Cash purchases of materials for stock	Dr. SLC A/c. Cr. GLA A/c.	Dr. SLC A/c. Cr. Cash
2.	Credit purchases of Materials for stock	Dr. SLC A/c. Cr. GLA A/c	Dr. SLC A/c Cr. Sundry Creditors.
3.	Purchase of Materials for Jobs	Dr. WIP A/c Cr.GLA A/c	Dr. WIP A/c Cr. Cash or S. Creditors
4.	Direct Materials issued to Production	Dr. WIP A/c Cr. SLC A/c	Dr. WIP A/c Cr. SLC A/c
5.	Issue of Indirect Materials	Dr. POH Control A/c Cr. SLC A/c	Dr. POH Control Cr. SLC A/c

6.	Materials Returned from Production	Dr. SLC A/c Cr. WIP A/c	Dr. SLC A/c Cr. WIP A/c
7.	Materials Returned to Suppliers.	Dr. GLA A/c Cr. SLC A/c	Dr. Creditors A/c Cr. SLC A/c
8.	Material transfer between jobs	No entry	No entry
9.	Materials Shortage: If it is normal (In case of normal loss without any scrap , no entry is required)	Dr. POH A/c Cr. SLC A/c	Dr. POH A/c Cr. SLC A/c
	For scrap realization	Dr. GLA Cr. POH	
	If it is abnormal & have no scrap value	Dr. Costing P&L. A/c Cr. SLC A/c	Dr. P&L. A/c Cr. SLC A/c
10.	Payment to Creditors	No entry	Dr. Creditors A/c Cr. Bank A/c
11.	Payment of Wages and salaries. (Direct +Indirect)	Dr. WC A/c Cr. GLA A/c	Dr. W.C A/c Cr. Cash A/c
12.	Direct Wages allocated	Dr. WIP A/c Cr. WC A/c	Dr. WIP A/c Cr. WC A/c
13.	Indirect Wages allocated	Dr. POH Control A/c Cr.WCA/c	Dr. POH Control A/c Cr. WC A/c
14.	Direct Expenses.	Dr. WIP A/c Cr. GLA A/c	Dr. WIP A/c Cr. Cash A/c, or Creditors A/c
15.	Depreciation on plant and Machinery	Dr. POH A/c Cr. GLA A/c	Dr. POH A/c Cr. Plant& Machinery A/c
16.	Overheads incurred (Production admin, or selling)	Dr. …Ohd. Control A/c Cr. GLA A/c	Dr. …Ovh. Control A/c Cr. Cash A/c or Creditors.
17.	POH absorbed.	Dr. WIP A/c Cr. POH A/c	Dr. WIP A/c Cr. POH A/c
18.	AOH absorbed - in production nature	Dr. WIP A/c Cr. AOH A/c	Dr. WIP A/c Cr. AOH A/c
19.	AOH absorbed- marketing nature	Dr. COS A/c Cr. AOH A/c	Dr. COS A/c Cr. AOH A/c
20.	S and D OH absorbed	Dr. COS A/c Cr. S & D OH A/c	Dr. COS A/c Cr. S & D OH A/c
21.	Under absorption of Overheads	Dr. Costing P&L A/c Cr. OH Control A/c	Dr. P & L A/c Cr. OH Control A/c
22.	Over-absorption of overheads	Dr. Oh Control A/c Cr. Costing P & L A/c	Dr. OH Control Cr. P & L A/c

23.	Finished goods produced.	Dr. FGL A/c Cr. WIP A/c	Dr. FGL A/c Cr. WIP A/c
24.	Cost of Goods sold – transfer from FG control a/c	Dr. COS A/c Cr. FGL A/c	Dr. COS A/c Cr. FGL A/c
25.	Cost of sales	Dr. Costing P&L A/c Cr. COS A/C	Dr. P & L A/c Cr. COS A/C
26	Sales.	Dr. GLA A/c Cr. Costing P&L A/c	Dr. Cash or Debtors. Cr. Sales A/c
27.	Net Profit	Dr. Costing P&L A/c Cr. GLA A/c	Dr. P & L A/c Cr. Capital A/c.



Note :

1. **WIP ledger is actually the summation of different jobs. So material transfer from one job to another is not to be shown.**

2. **Generally SLC A/C, WIP A/C, FGL A/C have debit balances & GLA A/c has credit balance. Prepare the Trial balance on that basis. If there any missing figure then find it from the opening trial balance. When overhead control a/c appears in trail balance, it implies that carry forward method following under/over recovery, is followed.**

Problems :

1. Aeme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July 2009 as follows. Prepare the necessary control accounts & Trial Balance as on the closing date

	Rs.	Rs.
Material Control a/c	1,24,000	
Work in Progress a/c	62,500	
Finished Goods a/c	1,24,000	
Production Overhead	8,400	
Administration Overhead		12,000
Selling and Distribution Overhead a/c	6,250	
General or Nominal Ledger Control a/c	. .	3,13,150
	3,25,150	3,25,150

The following are the transaction for the quarter ended 30th September, 2009:

	Rs.
Materials purchased	4,80,100
Material issued to jobs	4,77,400
Materials to work maintenance	41,420
Materials to administration	3,400
Materials to selling department	7,200
Wages direct	1,49,300
Wages indirect-(production)	65,000
Transportation for incoming materials	8,400
Material return to store	7,800
Material return to supplier	12,300
Wages indirect administration	12,500
Salesman salary	40,000
Distribution salary	11,600
Rent of machine (Direct expense)	22,500
Material transfer between batches	4,000
Production overheads	2,42,250
Absorbed overheads production	3,59,100
Administration overheads	74,000
Administration allocation to production	52,000
Administration allocation to sales	14,800
Sales overheads incurred	64,200
Sales overheads absorbed	82,000
Finished goods produced	9,58,400
Finished goods sold	9,77,300
Sales Realisation	18,43,000

2. A company operates on historic job cost accounting system, which is not integrated with the following accounts. At the beginning of a month, the opening balances in cost ledger were :

			Rs. (in lakhs)
Stores Ledger Control Account			80
Work-in-Progress Control Account			20
Finished Goods Control Account			430
Building Construction Account			10
Cost Ledger Control Account			540
During the month, the following transaction took place :			
Materials	--	Purchased	40
		Issued to production	50
		Issued to general maintenance	6
		Issued to building construction	4
Wages	--	Gross wages paid	150
		Indirect wages	40
		For building construction	10
Works Overheads	--	Actual amount incurred (excluding items shown above)	150
		Absorbed in building construction	20
		Under absorbed	8
Royalty paid			5
Selling, distribution and administration overheads.			25
Sales			450

At the end of the month, the stock of raw material and work-in-progress was Rs.55 lakhs and Rs.25 lakhs respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales. Prepare the Relevant Control A/c to record the above transactions in the cost ledger of the co.

INTEGRAL SYSTEM

3. A B C Ltd. operates an integrated accounting system and the following details are given for the year ended 31st March 2009:- Trial Balance as at 31st March 2009:

	Debit (Rs)	Credit(Rs)
Share Capital		20,00,000
Reserves		2,00,000
Creditors for purchases		1,50,000
Expenses creditors		20,000
Freehold buildings, at cost	5,00,000	
Plant and Machinery, at cost	13,00,000	
Provision for depreciation on plant and machinery		1,00,000
Stock of : Raw material	2,20,000	
Work in progress	40,000	
Finished goods	60,000	
Debtors	2,00,000	
Bank	1,50,000	
	24,70,000	24,70,000

The following data for the month of April 2009 are given:

		Rs.
Raw material purchased on credit		9,90,000
Raw material returned to suppliers		40,000
Material issued to production		8,50,000
Material returned from shop floor		20,000
Factory wages paid: Productive		2,50,000
Non Productive		50,000
Salaries paid :	Administration	1,00,000
	Selling & Distribution	75,000
Overhead expenses incurred but not paid:		
	Production	3,00,000
	Administration	50,000
	Selling & Distribution	1,00,000
Depreciation for the month on Plant & machinery		50,000
Sales on credit		20,00,000
Cash received from debtors		19,50,000
Paid the following by cheque		
	Creditors for purchases	10,00,000
	Creditors for Expenses	4,30,000
Overhead Recovered during the month		
Production overhead	applied to production	3,90,000
Administration overhead	applied to finished goods	1,45,000
Selling & distri.overhead	applied to cost of sales	1,80,000
Closing Stock:		
	Work-in-progress	2,10,000
	Finished goods	2,15,000

Required:
(a) Show the appropriate ledger accounts.
(b) Prepare the income statement for April 2009.
(c) Prepare the Balance Sheet as at 30th April 2009.

4. The following incomplete accounts are furnished to you for the month ended 31st October, 2009:

Store Control Account

1.10.09 To Balance	5,400		

Work in progress

1.10.09 To Balance	6,000		

Finished Goods Control Account

1.10.09 To Balance	75,000		

Factory Overhead Control Account

Total debits for October, 2006	45,000		

Creditors for Purchases Account

		1.10.09 By Balance	30,000

Additional information:

(i) The factory overheads are applied by using a budgeted rate based on Direct Labour Hours. The budget for the overheads for 2009 is Rs. 6,75,000 and the budget of direct labour hours is 4,50,000 .

(ii) The balance in the account of creditors for purchases on 31.10.09 is Rs. 15,000 and payments made to creditors in October, 2009 amount to Rs. 1,05,000.

(iii) The finished goods inventory as on 31st October,2009 is Rs, 66,000.

(iv) The cost of goods sold during the month was Rs. 1,95,000.

(v) On 31st October,2009 there was only one unfinished job in the factory . The cost records show that Rs. 3,000 (1,200 direct labour hours) of Direct Labour Cost and Rs. 6,000 of Direct Material Cost had been charged.

(vi) A total of 28,200 direct labour hours were worked in October, 2009. All factory workers earn same rate of pay.

(vii) All actual factory overheads incurred in October, 2009 have been posted.

Required to find:

a. Materials purchased during October, 2009.
b. Cost of goods completed in Oct, 2009.
d. Overheads applied in October, 2009.

d. Balance of w.i.p. on 31st October, 2009.
e. Direct materials consumed during October, 2009.

f. Balance of Stores Control Account on 31st October, 2009
g. Over absorbed or under absorbed Overheads for October,

Reconciliation

Proforma of A Reconciliation Statement:

	Rs.	Rs.
Profit as per cost accounts:		**xx**
Add.		
1. Income and profits taken in financial accounts and not in cost accounts.	**Xx**	**xx**
2. Notional expenses taken in cost accounts and not in financial accounts.	**xx**	
3. Over-absorption overheads in cost accounts.	**xx**	
4. Excess valuation of opening inventory in cost accounts as compared to valuation in financial accounts.	**xx**	
5. Lower valuation of closing inventory in cost accounts as compared to valuation in financial accounts.	**xx**	
6. Excess depreciation accounted for in cost accounts.	**Xx**	**xx**
Less:		
1. Expenses and losses accounted for in financial accounts and not in cost accounts.	**xx**	
2. Appropriations in financial accounts only.	**xx**	
3. Notional income taken in cost accounts and not in financial accounts.	**xx**	
4. Under-absorption of overheads in cost accounts.	**xx**	
5. Lower valuation of opening inventory in cost accounts as compared to valuation in financial accounts.	**xx**	
6. Higher valuation of closing inventory in cost accounts as compared to valuation in financial accounts.	**xx**	
7. Lower depreciation accounted for in cost accounts.	**Xx**	**xx**
Profit or loss as per Financial A/c		**xx**

Note: Inventory includes raw materials, stores, spares work-in-progress, stock of finished goods etc.

Problems

1. The figures have been extracted from the financial accounts of a manufacturing firm for the first year of its operation.

	Rs.
Direct material consumption	50,00,000
Direct wages	30,00,000
Factory overheads	16,00,000
Administrative overheads	7,00,000
Selling and distribution overheads	9,60,000
Bad Debts	80,000
Preliminary Expenses written off	40,000
Legal charges	10,000
Dividends received	1,00,000
Interest on deposit received	20,000
Sales - 1,20,000 units	1,20,00,000
Closing Stock :	
Finished Stock -4,000 units	3,20,000
Work-in-progress	2,40,000

The Cost Accounts for the same period reveal that the Direct material consumption was Rs. 56,00,000 ; Factory overhead is recovered at 20% on Prime cost ; Admn. Overhead(of production nature) is recovered @ Rs. 6 per unit of production ; and Selling and distribution overheads are recovered at Rs. 8.00 per unit sold.

You re required to prepare costing, and Financial Profit and Loss Accounts and reconcile the difference in the Profits as arrived at in the two sets of accounts.

2. The financial records of Modern Manufacturers Ltd. reveal the following for the first year ended 30.6.2009:

	Rs. in '000
Sales (20,000 units).	4,000
Materials	1,600
Wages	800
Factory Overheads	720
Office and Administrative Overheads	416
Selling and Distribution Overheads	288
Finished Goods (1,230 units).	240
Work in Progress :	
Materials	48
Labour	32
Overhead (Factory)	112
Goodwill written off.	320
Interest of Capital	32

In the Costing Records, factory overheads is charged at 100% wages, administration overhead of production nature is 10% of conversion cost and selling and distribution overhead at the rate of Rs. 16 per unit sold.

Prepare a statement reconciling the Profit as per cost records with the Profit as per financial records of the Company & also memorandum Reconciliation statement.

3. The following figures have been extracted from the Cost Records of a manufacturing unit:

	Rs.
Stores :	
Opening Balance	30,000
Purchases	1,60,000
Transfers from work-in-Progress	80,000
Issues to work-in-Progress	1,60,000
Issues to Repairs and Maintenance	20,000
Deficiencies found in stock taking	6,000
Work-in-Progress :	
Opening Balance	60,000
Direct Wages applied	60,000
Overheads applied	2,40,000
Closing balance	40,000

Finished products : Entire output is sold at a profit of 10% on cost from work-in-progress
Others : wages incurred Rs. 70,000 ; Overhead incurred Rs. 2,50,000. Items not included in Cost Records : Income from investments Rs. 10,000.
Prepare Profit and Loss Account, Costing Profit & Loss A/c and Reconciliation statement.

4. The profit and loss account as shown in the financial books of a company for the year ended 30.9.2009 together with a statement of reconciliation between the profit as per financial and cost accounts is given below

Profit and Loss Account for the year ended 30.9.2009

	Rs.	Rs.		Rs.	Rs.
Opening Stock			Sales		15,00,000
Raw Materials	90,000		Closing Stock :-		
Work in progress	50,000		Raw Materials	98,000	
Finished goods	70,000		Work in progress	53,000	
		2,10,000	Finished goods	72,000	
					2,23,000
Raw Material purchases		5,00,000	Miscellaneous receipts		45,000
Direct wages		2,00,000			
Factory overheads		2,00,000			
Administration expenses		1,70,000			
Selling & Distribution Expenses		2,20,000			
Preliminary expenses Written off		75,000			
Debenture Interest		30,000			
Net Profit		1,63,000			
		17,68,000			17,68,000

Statement of reconciliation of profit as per financial and cost accounts

	Rs.	Rs.
Profit as per financial accounts		1,63,000
Difference in valuation of stock :		
Add : Raw Materials - closing stock	1,200	
Work in progress-Opening stock	1,300	
Finished goods - opening stock	2,000	
- Closing stock	1,000	
Total (A)	5,500	
Less : Raw Materials - Opening stock	1,650	
Work in progress - closing stock	750	
Total (B)	2,400	
(A-B)		3,100
Other items :		
Add : Preliminary expenses written off	75,000	
Debenture interest	30,000	
	1,05,000	
Less : Miscellaneous receipts	45,000	
	60,000	
Add: under recovery of production overhead	20,000	
	80,000	
Less: over recovery of administration overhead	15,000	65,000
Profit as per Cost Accounts		2,31,100

You are required to calculate the profit as per cost accounts.

5. The following information is available from the financial books of a company having a normal production capacity of 60,000 units for the year ended 31st March, 2009:

(i) Sales Rs.10,00,000 (50,000 units).

(ii) There was no opening and closing stock of finished units

. (iii) Direct material and direct wages cost were Rs. 5,00,000 and Rs.2,50,000 respectively.

(iv) Actual factory expenses were Rs.1,50,000 of which 60% are fixed.

(v) Actual administrative expenses were Rs.45,000 which are complete fixed.

(vi) Actual selling and distribution expenses were Rs.30,000 of which 40% are fixed.

(vii) Interest and dividends received Rs.15,000.

You are required to prepare a statement reconciling profits shown by financial and cost books.

6. A manufacturing company disclosed a net loss of Rs.3,47,000 as per their cost accounts for the year ended March 31,2009. The financial accounts however disclosed a net loss of Rs.5,10,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts:

		Rs.
(i)	Factory Overheads under-absorbed	40,000
(ii)	Administration Overheads over-absorbed	60,000
(iii)	Depreciation charged in Financial Accounts	3,25,000
(iv)	Depreciation charged in Cost Accounts	2,75,000
(v)	Interest on investments not included in Cost Accounts	96,000
(vi)	Income-tax provided	54,000
(vii)	Interest on loan funds in Financial Accounts	2,45,000
(viii)	Transfer fees (credit in financial books)	24,000
(ix)	Stores adjustment (credit in financial books)	14,000
(x)	Dividend received	32,000

Prepare a Memorandum Reconciliation Account.

Operating Costing

Problems on Transport:

1. Carryall Enterprise has been permitted to run a Minibus in a route covering 25 km. The Minibus has been purchased at a cost of Rs.14 lakh part of which was financed through bank loan and balance by loan from other sources.

The annual charges for the Minibus are Insurance Rs.24,000 Road tax Rs. 36,000 and garage Rent Rs. 31,200. Cost of repairs and maintenance in estimated at Rs. 26,000 p.a. while replacement of Tyres and Tube will cost Rs. 4280 p.m. Office Expenses are estimated at Rs. 6,000 p.m. Petrol and oil will cost @ Rs. 12 per kilometer.

Two drivers and two conductors are engaged at a monthly salary of Rs. 12,500 and Rs. 9,000 respectively, In addition, drivers and conductors are entitled to get 5% on the sale of tickets. The effective life of the vehicles is estimated at 5 years, at the end of which will have scrap value of Rs. 1,00,000. The Minibus is 24 seaters and is expected to run 6 two-way trips during the day for 25 days in month.

` You are required to submit passenger fare-structure for approval by the transport authority, which allow 20% profit on net sales, Interest on loan it also allowed at cost, if installments are paid regularly. The amount of interest is to be Rs. 36,720, p.a.

2. There are 2 warehouses for storing finished goods in a factory. Warehouse A is at a distance of 20 km. & warehouse B at a distance of 25 km. from the factory. A fleet of (8 tonne) 10 lorries is engaged in transporting the finished goods from the factory. The records show that the lorries average a speed of 30 km p. h. when running & regularly takes 40 minutes to load at the factory. At 'A', unloading takes 30 minutes/ load while at warehouse 'B', it takes 20 minutes/ load.

Drivers wages, depreciation, insurance and taxes amount to Rs. 5,300 per hour operated. Fuel, oil, Tyres and maintenance cost Rs. 200 per kilometers. You are required to draw up a statement showing the cost per tonne-kilometer for carrying the finished goods to the two warehouses.

3. A city municipality arranges for the removal of its garbage by means of motor vehicular transport. The following vehicles are maintained.

No. of Vehicles	Specification
20	5 – tonne lorries
30	3 – tonne lorries
50	2 – tonne lorries
40	4 – tonne lorries

On an average, each lorry makes 5 trips a day and in each trip covers an average distance on 6 kms. Each lorry carries garbage weighing only 50% of its capacity. Taking an annual average, 10% of the lorries are laid up for repairs every day. The conservancy work is carries on daily.

The total monthly charges incurred on the conservancy transport is Rs. 20,56,000.

Assuming that a month consist of 30 days, Calculate the cost per tonne-km for removal of garbage.

4. SMS is a public school having five buses each plying in different directions for the transport of its school students. In view of a large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school.

The work-load of the students has been so arranged that in the morning the first trip picks up senior students and the second trip playing an hour later picks up the junior students. Similarly in the afternoon the first trip drops the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus one way is 20 km. The school works 25 days in a month and remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all the 12 months in a year.

The details of expenses for a year are as under:

Driver salary	Rs. 4,500 per month per driver
Cleaner's salary	Rs. 3,500 per month per cleaner
(Salary payable for all 12 months one cleaner employed- for all the five buses)	
Licence fee, taxes, etc.	8,600 per bus per annum
Insurance	10,000 per bus per annum
Repairs and maintenance	35,000 per bus per annum
Purchase price of the bus	12,00,000 each
Life	12 years
Scrap value	Rs. 30,000
Diesel cost	Rs. 40 per liter

Each bus gives an average mileage of 12 km. per liter of diesel. The seating capacity is fully occupied during the whole year. Seating capacity of each bus – 50 students.

Students picked up and dropped within a range up to 10 km of distance from the school are charged half fare and fifty per cent of the students Travelling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost you are required to:

a. Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year;

b. Work out the average cost per student per month in respect of :
   (i) Student coming from a distance of up to 10 km. from the school, and
   (ii) Student coming for a distance beyond 10 km. from the school.

5. A cement manufacturing Co. is facing the problem of transportation of limestone from its quarry. The quarry is situated 25 km. away and the only mean of transport available is the road ways.

The quantity of limestone to be transported p.m. is 24,000 tonnes. While examining the feasibility of departmental transport following facts come to be recognized. Two types of trucks are available in the market namely 10 Tons and 8 Tons;

Details of operating Cost for the trucks:

	10 Tonners	8 Tonners
Purchase price of truck	Rs. 7.5 lakhs	Rs. 5 lakhs
Estimated useful life	5 years	5 years
Residual value	Rs. 40,000	Rs. 20,000
KM. per liter of diesel	13 km	14 km
Maintenance cost per truck	Rs. 20,000 p.m.	Rs. 16,000 p.m.
Vehicle and road tax per quarter	Rs. 6,000	Rs. 6,000
Cost of diesel per liter	Rs. 40	Rs. 40
Cost of finance for purchase of trucks	12 % p.a.	14 % p.a.

Each vehicle can run 5 trips (up & down) each day, & can run on an average for 24 days in a month: Driver will have to be recruited according to the no. of trucks to be purchased. In addition, one extra drivers for every 5 vehicles will be required for the entire fleet. A driver will cost Rs. 4,000 p.m. An additional transport supervisor would be required at a cost of Rs. 25,000 p.m.
Yet another possibility is to hire sufficient no. of trucks (8 tanners only) from a transport Co. at the rate of Rs.30,000 p.m. per truck. The transport Co. will undertake to pay repairs and maintenance costs as well as vehicle and road tax. The cement Co. has to bear the cost of drivers, supervisor and other operational costs. Advise.

6. AZ Transport Group p.l.c comprises three divisions – AZ Buses; AZ Taxis; and Maintenance. AZ Buses operates a fleet of eight vehicles on four different routes in Ceetown,. Each vehicle has a capacity of 30 passengers. There are two vehicles assigned to each route, and each vehicle completes five return journeys per day, for six days each week, for 52 weeks per year.

AZ Buses is considering its plans for the year ending 31st December 2009. Data in respect of each route is as follows :

	Route W	Route X	Route Y	Route Z
Return travel distance (km)	42	36	44	38
Average number of passengers :				
Adults	15	10	25	20
Children	10	8	5	10
Return journey fares (in Rs.):				
Adults	3.00	6.00	4.50	2.20
Children	1.50	3.00	2.25	1.10

The following cost estimates have been made (in Rs.):

Fuel and repairs per kilometer	0.1875
Drivers' wages per vehicle per work-day	120
Vehicle fixed cost p.m.	2,000
General fixed cost p.a.	300,000

Requirements:

(a) Prepare a statement showing the planned income of each route and the total contribution and profit of the AZ Buses division for the year ending 31st December 2009.

(b) In route W only adult fare will increase to Rs.3.75 per return journey, this will reduce the number of adult passengers using this route by 20%,(assuming that the ratio of adult to child passengers remains the same). Recommend whether or not AZ Buses should amend the adult fare on route W.

Application of indifference point or BEP

7. A practicing Chartered Accountant now spend Rs. 9.00 per KM on taxi fares for his clients work. He is considering tow other alternatives, the purchase of a new small car or an old bigger car. The estimated cost figures are :

Items	New Small Car.	Old Bigger Car.
Purchase price	Rs. 3,50,000	2,00,000
Sale price, after 5 years	Rs. 40,000	40,000
Repairs and servicing per annum	Rs. 10,000	12,000
Taxes and Insurance per annum	Rs. 10,790	7,000
Petrol consumption, per liter	10 km	7 km.
Petrol price, per liter	Rs. 35	35

Calculate

a. He estimates that he does 10,000 km. annually. Which of the 3 alternatives will be cheaper?

b. If his practice expands and he has to do 19,000 km. per annum what should be his decision?

c. At how many km. per annum will the cost of the two cars break-even and why?

d. At what distance the small car have a saving of Rs.1.500 over the big car?

e. if the fuel available is 1,950 litter, which car will be preferred?

Hotel Industry

8. A lodging home is being run in a small hill station with 50 single rooms. The home offers concession rates during six off-seasons months in a year. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. Occupancy during the season is 80%, while in the off season is 40% only, assume a month to be of 30 days.

The following are the cost estimates and other details for the year ending 31st March, 2009

(i)	staff salary (excluding room attendants)	12,75,000
(ii)	repairs to buildings	21,30,500
(iii)	laundry & linen	4,40,000
(iv)	interior and tapestry	8,87,500
(v)	sundry expenses	23,95,400

Annual depreciation is to be provided for buildings at 5% & on furniture & equipments at 15% on straight line basis. Room attendants are paid Rs.250 per room-day on the basis of occupancy of the rooms in a month: Monthly lighting charges are Rs.2,120 per room, except in 4 months of winter when it is Rs.930 per room & this cost is on the basis of full occupancy for a month.

Total investments in the home is Rs.220 lakhs of which Rs.140 lakhs relate to buildings and balance for furniture and equipments.

You are required to work out the room rent chargeable per day both during the season and the off-season months, on the basis of the foregoing information.

9. A hotel has three types of suites for its customers viz. Single suite. Double suite & Three room suite. You are requested to suggest what rent should be charged for each type of suite on the basis of the following information.

1. The rent of double room suite is to be fixed as two times the single suite and that of three room as five times of the single suite.
2. There are 20 three room suites, 30 double- room and 100 single room suites in the hotel.

3. Normally 90% of single room, 80% of double room and 60% of three room suites are occupied in summer . In winter 30% of single room 20% of double room and 20% of three room suites are occupied.

4. Annual Expenses are as follows :

Room Attendants' Salary

Rs. 400 daily per single room occupied in summer, Rs. 500 per double room, Rs. 700 per 3 room & Rs. 300 daily per room occupied in winter, Rs. 450 per double room, Rs. 600 per 3 room.

Lighting & Heating :

Lighting Rs.480 for single room suite p. m. if occupied for full month for both summer & winter Rs.650 for double room suite per month if occupied for full month for both summer & winter Rs.800 for three room suite p.m. if occupied for full month for both summer & winter.

Power:

Rs. 320 for single room suite per month if occupied for full month for both summer and winter.Rs. 730 for double room suite per month if occupied if full month for both summer and winter. and Rs. 940 per 3-room suite per month if occupied for full month for both summer and winter.

		Rs.
Repairs and Renovation		33,42,000
License etc.		45,45,000
Interior decoration		62,00,000
Sundries		1,10,31,550
Staff salaries.		2,12,20,000
Depreciation :		
Building	@ 5% on	3,14,00,000
Furniture and Fixture	@ 10% on	1,81,00,000
Air conditioner	@ 10% on	3,92,00,000

5. Summer may be assumed for 7 months and winter for 5 months in a year. Normal days in a month may be taken as 30.

6. Profit on cost 35% so that interest on investments may also be covered in such profits.

On Library

10. A club runs a library for its members. As part of club policy, an annual subsidy of up to Rs. 5 per member including cost of books may be given from the general funds of the club. The management of the club has provided the following figures for its library department:

Number of Club members	5,000
Number of Library members	1,000
Library fee per member per month	Rs. 100
Fine for late return of books	Re. 1 per book per day
Average No. of books returned late per month	500
Average No. of days each book is returned late	5 days
Number of available old books	50,000 books
Cost of new books	Rs. 300 per book
Number of books purchased per year	1,200 books
Cot of maintenance per old book per year	Rs. 10

Staff details	No.	Per Employee Salary per month (Rs.)
Librarian	01	10,000
Assistant Librarian	03	7,000
Clerk	01	4,000

You are required to calculate:

(i) The cost of maintaining the library per year excluding the cost of new books;

(ii) The cost incurred per member per month on the library excluding cost of new books; and

(iii) The net income from the library per year.

(iv) If the club follows a policy that all new books must be purchased out of library revenue
  (a) What is the maximum number of books that can be purchased per year and
  (b) How many excess books are being purchased by the library per year?

(v) Comment on the subsidy policy of the club.

Banking Sector:

11. ABC Bank is examining the profitability of its Premier Account, a combined Savings & cheque account. Depositors receive a 7% annual interest on their average deposit. ABC Bank earns an interest rate spread of 3% (the difference lending money for home loan purpose at 10%.

The Premier Account allows depositors unlimited use of services such as deposits, withdrawals, cheque facility, and foreign currency drafts. Depositors with Premier Account balances of Rs. 50,000 or more receive unlimited free use of services. Depositors with minimum balance of less than Rs. 50,000 pay Rs. 1,000 a month service fee for their Premier Account.

ABC Bank recently computed recovery rates on Absorption costing study of its services. The use of these services in 2008-09 by three customers is as follows:

	Rate per Transaction	Account Usage customer X	Customer Y	Customer Z
Deposits/withdrawal With teller	Rs. 125	40	50	5
Deposits/withdrawal With automatic teller Machine (ATM)	Rs. 40	10	20	16
Deposits/withdrawal On prearranged Monthly basis	Rs. 25	0	12	60
Bank cheque written	Rs. 400	9	3	2
Foreign Currency drafts	Rs. 600	4	1	6
Inquiries about Account balance	Rs. 75	10	18	9
Average Premier Account Balance for 2008-09		Rs. 55,000	Rs. 40,000	Rs. 12,50,000

Assume Customer X and Z always maintain a balance above Rs. 50,000, whereas Customer Y always has a balance below Rs. 50,000.

Required:

(i) Compute the 2008-09 profitability of the customers X, Y and Z Premier Account at ABC Bank

(ii) What evidence is there of cross-subsidization among the three Premier Accounts? Why might ABC bank worry about this Cross-subsidization, if the Premier Account product offering is Profitable as a whole?

(iii) What changes would you recommend for ABC Bank's Premier Account?

Marginal Costing

So far in this text we have worked within the framework of a total costing system. With absorption costing, all stock items are valued at their full production cost. This includes fixed production overhead which has been absorbed using one of the bases which you learned about earlier.

In contrast, marginal costing values all stock items at their variable or marginal costs only. Fixed costs are treated as period costs and are written off in full against the contribution for the period.

Since the two systems value stocks differently, it follows that each will report a different profit figure for the period if stock levels alter.

The terms marginal costs and variable cost tend to be used interchangeably. In marginal costing the variable costs are matched against the sales value for the period to highlight an important performance measure: Contribution.

Contribution = Sales value- Variable Costs

It is called contribution because it literally does contribution towards fixed costs and profit. Once the contribution has been calculated for the period, fixed costs are deducted to determine the profit for the period.

1. Important factors of Marginal Costing Decisions.

i. Whether the product or production makes a contribution.

ii. In the selection of alternatives, additional fixed costs if any should be considered.
iii. The continuity of demand after expansion and its impact on selling price are to be considered.

iv. Non-cost factors such as the need to keep labour force intact and government attitude are also to be taken into account.

2. CVP analysis and its purposes

Profit per unit of a product depends on its selling price and cost of sales. Total profit depends on sales volume which in turn depends interalia on selling price. By and large cost also depends on volume of production. Thus, a close relationship exist between costs, volume and profit.
The following purposes are served by analysis of cost-volume-profit relationship :

i. to forecast profit fairly accurately.
ii. to set up flexible budgets.
iii. To evaluate performance for control.
iv. To ascertain the effects of costs of changes in volume for market expansion or contraction.
v. To formulate price policies.
vi. To known the amount of overhead costs that could be changed to productions costs at various levels of operation.

3. The assumptions of CVP:

- All variables remain constant per unit.
- A single product or constant sales mix.
- Fixed costs do not change.
- Profits are calculated on variable cost basis.
- Total costs and total revenues are linear functions of output.
- The analysis applies to relevant range only.
- Costs can be accurately divided into fixed and variable components.
- The analysis applies only to short-term horizon.

4. Profit/Volume Ratio :

Profit volume ratio is the ratio of contribution denoting the difference between sales and variable cost. Since in the short term fixed cost does not change, Profit/volume ratio also measures the rate of change of profit due to change in the volume of sales.

Thus Profit/Volume ratio is expressed as: **P/V =Contribution ÷ sales**

5. Break even point:

Break even point represents that volume of production where total cost equal total revenue resulting into a no-profit no-loss situation. If output falls below that point, there is loss and if output exceeds the point there is profit. Therefore at break even point.

Revenue = Total Cost
Sales = Fixed Cost + Variable Cost
Sales-variable Cost = Contribution = Fixed Cost

6. Assumptions of break-even analysis.

i. All costs can be easily classified into fixed and variable components.
ii. Both revenue and cost functions are linear over the range of activity under consideration .
iii. Prices of output and input remain unchanged.
iv. Productivity of the factors of production will remain the same.
v. The state of technology and the process of production will not change.
vi. There will be no significant change in the levels of inventory.
vii. The company manufactures a single product.
viii. In the case of a multi-product company, the sales mix will remain unchanged.

7. Limitations of break-even chart.

1. The variable cost line need not necessarily be a straight line because of the possibility of operation of law of increasing costs or law of decreasing returns.
2. Similarly the selling price will not be a constant factor. Any increase or decrease in output is likely to have an influence on the selling price.
3. When a number of products are produced, separate break-even charts have to be drawn. This poses a problem of apportionment of fixed expenses to each product.
4. Break-even charts ignore the capital employed in business which is one of the important guiding factor in the determination of profitability.

8. Margin of Safety:

Margin of safety is the difference between the sales or production at a particular level of activity and the break even sales a production. A large margin of safety indicates the soundness of the business and correspondingly a small margin of business indicates a not too-sound position. Margin of safety can be improved by lowering the fixed cost and variable costs, increasing the volumes of sales and production, increasing the selling prices or changing the product mix resulting into a better overall Profit/Volume ratio.

Margin of safety = Profit ÷ P/V ratio.

9. Angle of Incidence:

It is the angle of intersection between the sales and the total cost lines. It indicates the profit earning capacity of the concern at a certain level of sales production. The larger the angle of incidence the more is the profit earning capacity and vice versa. It also provides an indication as to what extent the output & sales price may be varied to attain a desire level of profit. It gives an easy and clear idea to the profitability under different levels of activities & also for different product mix & is a simple visual aid to find out profit earning capacity without going in for any calculation.

10. Limitations of Marginal Costing

1. Marginal Costing assumes that all costs can be classified into fixed and variable.
2. Contribution of a product itself is not a guide for optimum profitability.
3. Marginal Costing ignores time factor and investment.
4. The overheads of fixed nature cannot altogether be excluded particular contracts while valuing work-in-progress.
5. in the long run, the selling prices should be based on total cost i.e. inclusive of fixed cost also.

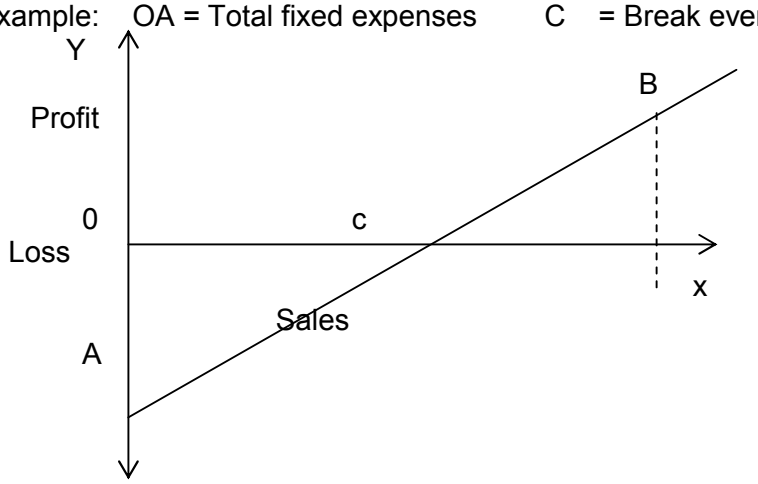
11. Distinguish between absorption costing and marginal costing.

	Absorption Costing	Marginal Costing
1.	It is a total cost technique i.e. both variable and fixed costs are charged to products, processes or operations.	Only variable costs are charged to product, processes or operations. Fixed costs are charged as period costs to the profit statement of the same period in which they are incurred.
2.	Fixed factory overheads are absorbed by the production units on the basis of a predetermined fixed factory overhead recovery rate based on normal capacity. Under/over absorbed overheads are adjusted before arriving at the figure of profit for a particular period.	The cost of production under this method does not include fixed factory overheads and therefore, the value of closing stock comprises of only variable costs. No part of the fixed expenses in included in the value of closing stock and carried over to the next period.
3.	Inspire of best possible forecast and equitable basis of apportionment/allocation of fixed costs, under or over recovery of fixed overheads generally arises.	Since fixed overheads are not included in the cost of production, therefore the question of their under/ over recovery does not arise.
4.	Managerial decisions under this costing technique are based on profit i.e. excess of sales value over total costs, which may at times lead to erroneous decisions.	Here decisions are made on the basis of contribution i.e. excess of sales price over variable costs. This basis of decision making Results in optimum profitability.

12. Profit Graph:

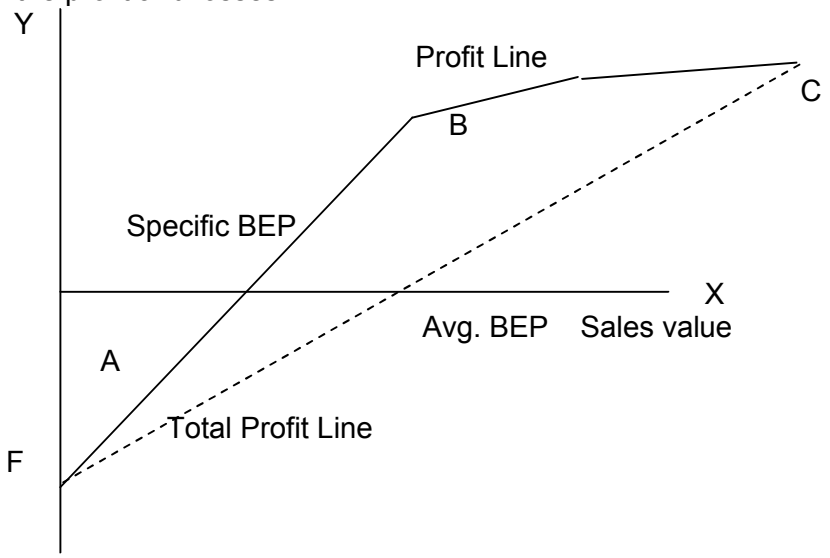
Profit graph is a special type of break – even chart which shows the profit or less at different levels of output.

In the following example: OA = Total fixed expenses C = Break even point



The profit or loss can be calculated by using following when sales are at zero, the total loss is equal to fixed expenses which is equal to OF. The loss demises as the output reaches C, the break – even point and the firm starts earning profits as the output increases beyond the break – even point. The total profit at output level of is equal to B.

When more than one product is manufactured, the Profit graph can be so drawn as to show the cumulative effects of the profit and losses.



To draw the above diagram , following steps are required --

Step-1: Compute P/V ratio for each product & give rank.

Step-2: Calculate cumulative sales & cumulative profit on the basis of the above ranking.

Step-3: Identify the points on the basis of cumulative sales (x) & cumulative profit (y). Join the points with same line and identify the specific BES.

Step-4: Join the start & end point with a single straight line to find arrange Break even sales

Formulae for BE calculations

1. **Sales - Variable Cost = Contribution = Fixed Cost + Profit**

2. **P/V ratio (or C/S ratio)** **= Contribution** **÷ Sales**
= Contribution per unit **÷ Selling price per unit**
= Change in Contribution **÷ Change in Sales**
= Profit **÷ Margin of Safety**

3. **Profit** **= (Sales × P/V ratio) - Fixed Cost = P/V ratio × Margin of Safety sales(Rs.)**
= Contribution p.u. × Margin of safety (in units)

4. **Break-even Point**

a. **Break Even point (in units)** **= Fixed Cost ÷ Contribution per unit**

b. **Break Even Sales (in sales value)** **= Fixed Cost ÷ P/V ratio**

c. **with Step cost** **: apply the concept of apparent BEP**

d. **Composite BEP i.e. more than one product with common fixed costs**

When sales mix in units are given

BEP in units = Fixed cost ÷ Average contribution

Average contribution = $\Sigma fx \div \Sigma x$

When sales mix in Rupee are given

BEP in Rs. = Fixed cost ÷ Average P/V ratio

Average P/V ratio = $\sum$ Sales Mix ×P/V Ratio

e. **Perishable product BEP = opening stock + req. from current period.**

f. **Cash BEP = Cash fixed cost ÷ contribution p.u. So do not consider the sunk cost.**

Problems :

1. Fill in the blanks for each of the following independent situations:

	A	B	C	D	E
Selling Price per unit	?	Rs. 50	Rs. 20	?	Rs. 30
Variable cost as% of Selling Price	60	?	75	75	?
No. of units sold	10,000	4,000	?	6,000	5,000
Marginal Contribution	Rs. 20,000	Rs. 80,000	?	Rs. 25,000	Rs. 50,000
Fixed Costs	Rs. 12,000	?	Rs. 1,20,000	Rs. 10,000	?
Profit/Loss	?	Rs. 20,000	Rs. 30,000	?	Rs. 15,000

2. Ronson Ltd. which makes only one product, sells 10,000 units of its product making a loss of Rs. 10,000. Variable cost per unit of the product is Rs. 8 and the fixed cost is Rs. 30,000.

Calculate (i) the number of units to break-even; (ii) the number of units to earn a profit of Rs. 6,000; (iii) the amount of profit from a sale of 20,000 units.

3. PQ Ltd. Reports the following cost structure at two capacity levels:

	(100% capacity)	
	2,000 units	1,500 units
Production overhead I	Rs. 3 per unit	Rs. 4 per unit
Production overhead II	Rs. 2 per unit	Rs. 2 per unit

If the selling price, reduced by direct material and labour, is Rs. 8 per unit, what would be its break-even point?

4. ABC Ltd. And MNO Ltd. Sell identical products in identical markets. Their budgeted income statement for the year 2007-08 are follows:

	ABC	MNO
	Rs.	Rs.
Sales	5,00,000	6,00,000
Less: Variable cost	4,00,000	1,80,000
Contribution	1,00,000	4,20,000
Less: Fixed Cost	20,000	2,70,000
Budgeted profits	80,000	1,50,000

Calculate:

(a) BEP for each company;
(b) Sales at which each company will earn a profit of Rs. 60,000;
(c) Sales at which both companies will have some profits;

(d) Which company will earn more when
  (i) Heavy demand;
  (ii) Low demand?

5. PQR Ltd. has furnished the following data for the two years :

	2008-09	2009-10
Sales	Rs.8,00,000	?
Profit/Volume Ratio (P/V ratio)	50%	37.5%
Margin of Safety Sales as a % of Total Sales	40%	21.875%

There has been substantial savings in the fixed cost in the year 2009-10 due to the restructuring process. The company could maintain its sales quantity level of 2008-09 in 2009-10 by reducing selling price.

You are required to calculate the following :

(i) Sales for 2009-10 in Rs.
(ii) Fixed cost for 2009-10
(iii) Break-even sales for 2009-10 in Rs.

6. Maruti Uddoyge Painters paints any car for Rs. 1,500. In the year just ended, the firm made Rs. 75,000 profit before taxes. The company had fixed costs of Rs. 1,20,000 and variable costs of Rs. 1,200 per paint job. In the year just began, the firm expects its variable costs to rise by 20% as a result of increases in labour and materials.

a. Suppose the firm decides to pass along its cost increase by raising its price. What would be the new rate if the firm wanted to maintain its income before tax at Rs. 75,000 per year and if the total demand remained at last year's level

b. Suppose the firm wanted to hold the line on price and push for more volume by staying open longer hours. How many paint jobs would be necessary to maintain profitability?

7. A company producing a single product sells it at Rs.50 per unit. Unit variable cost is Rs.35 and fixed cost amounts to Rs.12 lakhs p.a. With this data you are required to calculate the following, treating each independent of the other

(a) Percentage increase/decrease in sales volume units off-set an increase of Rs. 3 in the variable cost per unit & a 10% increase in selling price without affecting existing profits quantum.

(b) Quantum of advertisement expenditure permissible to increase sales by Rs.1.2 lakhs, without affecting existing profits quantum.

8. The profit volume ratio of X Ltd. is 50% and the margin of safety is 40%. You are required to calculate the net profit if the sales volume is Rs.1,00,000.

9. A Company manufactures a product, currently utilising 80% capacity with a turnover of Rs.8,00,000 at Rs.25 per unit. The cost data are as under :

Material cost Rs.7.50 per unit, Labour cost Rs.6.25 per unit
Semi-variable cost (Including variable cost of Rs.3.75) per unit) Rs.1,80,000
Fixed cost Rs.90,000 up to 80% level of output, beyond this an additional Rs.20,000 will be incurred.

Calculate :
(i) Activity level at Break-Even-Point
(ii) Number of units to be sold to earn a net income of 8% of sales
(iii) Activity level needed to earn a profit of Rs.95,000
(iv) What should be the selling price per unit, if break-even point is to be brought down to 40% activity level ?

10. Titan Engineering is operating at 70% capacity and presents the following information: -

Break-even point	Rs. 200 corers
P/V Ratio	40%
Margin of safety	Rs. 50 corers

Management has decided to increase production to 95% capacity level with the following modifications. The selling price will be reduced by 8 %. The variable cost will be reduced by 5% on sales .

The fixed cost will increase by Rs. 20 corers , including depreciation on additions , but excluding interest on additional capital. Additional capital of Rs. 50 corers will be needed for capital expenditure and working capital .

The management will be needed to earn Rs.10 corers over and above the present profit and also meet 20 per cent interest on the additional capital . What will be the revised : Break-even point , P/V Ratio , Margin of safety .

11. A Company had incurred fixed expenses of 4,50,000, with sales of Rs.15,00,000 and earned a profit of Rs.3,00,000 during the first half year. In the 2nd half, it suffered a loss of Rs.1,50,000.

Calculate:

(.i) The profit-volume ratio, break-even-point and margin of safety for the first half year.

(ii) expected sales-volume for the second half year assuming that selling price and fixed expenses remained unchanged during the second half year.

(iii) The break-even point and margin of safety for the whole year.

12. The comparative profit statement of two quarters of a firm is as under :

	Quarter I	Quarter II
Units sold	2,500	3,750
	Rs.	Rs.
Direct materials	87,500	?
Direct wages	62,500	?
Fixed and variable Factory overheads	75,000	96,000
Sales	2,75,000	?
Profit	50,000	65,250

In the second quarter, the direct material price has increased by 20%. These was a saving of Rs.4,000 in fixed overheads in the second quarter. The other costs and selling price remained the same. Determine the quantity that should have been sold in the second quarter to maintain the same amount of profit per unit as in the first quarter.

13. A single product company furnishes the following data :

	Year 1.	Year 2
Sales	Rs.24,00,000	?
PV ratio	33 ⅓%	30%
Margin of safety	25%	40%

While there was no change in the volume of sales in year 2, the selling price was reduced. Calculate the sales, fixed costs and profit for year 2.

BEP on Merger of companies or departments:

14. I co. & II co. have decided to merge into one company. The operating details of two companies are as follows:

	Company I	Company II
Percentage of capacity utilisation	90	60
Sales (Rs.)	5,40,00,000	3,00,00,000
Variable costs (Rs.)	3,96,00,000	2,25,00,000
Fixed costs (Rs.)	80,00,000	50,00,000

Assuming that these two companies merge into one, determine:

a. the break-even sales of the merged company,

b. the profitability of the merged company at the 80% level of capacity utilisation,

c. the turnover of the merged company required to earn a profit of Rs. 75,00,000, and

d. the percentage increase in selling price necessary to sustain an increase in fixed overheads by 5% when the merged company is working at a capacity to earn a profit of Rs. 75,00,000.

BEP with increase in Fixed & Semi-Variable cost

15. Calcutta Mahanagar, a local 'authority' whose area includes a holiday resort situated on the east cost, operates for 30 weeks each year, a holiday home which is let to visiting parties of children in care from other authorities. The children are accompanied by their own house mothers who supervise them throughout their holiday. From six to fifteen guests are accepted on terms of Rs. 100 present per week. No differential charges exist for adults and children. Weekly Costs incurred by the host authority are :

	Rs. per guest
Food	25
Electricity for hearing and cooking.	3
Domestic (laundry, cleaning etc.) expenses	5
Use of minibus.	10

Seasonal staff supervise and carry out the necessary duties at the home at a cost of Rs. 11,000 for the 30 week period. This provides staffing sufficient for six to ten guests per week but if eleven or more guests are to be accommodated, additional staff at a total cost of Rs. 200 per week are engaged for the whole of the 30-week period.

Rent, including rates of the property, is Rs. 4,000 per annum and the garden of the home is maintained by the council's recreation department which charges a nominal fee of Rs. 1,000 p.a.

You are required to tabulate the appropriate figures in such a way as to show the Breakeven point(s) and to comment on your figures.

16. Kalyan University conducts a special course on "Computer Application" for a month during summer. For this purpose, it invites applications from graduates. An entrance test is given to the candidates and based on the same, a final selection of a hundred candidates is made. The Entrance Test consists of four objective type examinations and is spread over four days, one examination per day. Each candidate is charged a fee of Rs. 500 for taking up the entrance test.

The following data was gathered for the past tow years.

Statement of Net Revenue from the Entrance Test For the Course of "Computer Application"

	2007	2008
Gross Revenue (Fees Collected)	Rs. 10,00,000	Rs. 15,00,000
Costs: Valuation	4,00,000	6,00,000
Question Booklets	2,00,000	3,00,000
Hall Rent at Rs. 20,000 per day	80,000	80,000
Salary	60,000	60,000
Supervision Charges (one supervisor for every 100 candidates at the Rate of Rs. 500 per day)	40,000	60,000
General Administration Expenses	60,000	60,000
Total Cost	8,40,000	11,60,000
Net Revenue	1,60,000	3,40,000

You are required to compute:
(a) The budgeted net revenue if 4,000 candidates take up the entrance test in 2009.
(b) The break-even number of candidates.
(c) The number of candidates to be enrolled if the net income desired is Rs. 2,00,000

Multi Product Problems:

17. Major Ltd. manufactures a single product X whose selling price is Rs. 40 per unit and the variable cost is Rs. 16 p.u. If the Fixed Costs for this year are Rs. 4,80,000 & the annual sales are at 50% margin of safety, calculate the rate of net return on sales , assuming an income tax level of 40% .

For the next year, it is proposed to add another product line Y whose selling price would be Rs. 50 per unit and the variable cost Rs. 10 per unit. The total fixed costs are estimated at Rs. 6,66,600. The sales mix of X: Y would be 7: 3. At what level of sales next year, would the co. break even? Give separately for both X and Y the break even sales in Re. & units.

BEP for perishable product

18. A Company produces formulations having a shelf life of one year. The company has an opening stock of 15,000 boxes on 1/1/2009 and expects to produce 75,000 boxes as was in the just ended year of 2008 . Expected Sale would be 78,000 boxes. Costing department has worked out escalation in cost by 25% on variable cost and 12% on fixed cost for the year 2009.

Fixed costs are estimated at Rs.16,80,000 . New price for 2009 is Rs.70/- per box while the sale price in 2008 was Rs. 60. Variable cost of the opening stock is Rs. 20 per box. Find BEP.. .

Marginal Vs. Absorption Costing:

19. PH Ltd. has a productive capacity of 2,00,000 units of product of BXE per annum, The Company estimated its normal capacity utilisation at 90% for 2008-09. The variable costs are Rs. 22 per unit & the fixed factory overheads were budgeted at Rs. 7,20,000 p.a. The variable selling overheads amounted to Rs. 6 per unit and the fixed expenses were budgeted at Rs. 5,04,000. The operating data for 2008-09 are us under :---

Production	1,60,000 units
Sales @ Rs. 40 per unit	1,50,000 units
Opening stock of finished goods	10,000 units

The cost analysis reveled an excess spending of variable factory overheads to the extent of Rs. 80,000. There are no variance in respect of other items of cost. Reconcile these two profits.

20. Wonder Ltd. manufactures a single product, Zest. The following figures relates to Zest for a one-year period:–

Activity Level	50%	100%
Sales and production (units)	400	800
		Rs. lakhs
Sales	8.00	16.00
Production cost :–		
Variable	3.20	6.40
Fixed	1.60	1.60
Selling and administration cost :		
Variable	1.60	3.20
Fixed	2.40	2.40

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of Zest at the beginning of the year. In the first quarter, 220 units were produced and 160 units were sold.

Prepare a profit reconciliation statement

Decision on limiting factor basis

21. The following particulars are taken from the records of a company engaged in manufacturing two products A and B, from a certain material :

.

	Product A (per unit) Rs.	Product B (per unit) Rs.
Sales	2,500	5,000
Material Cost (Rs.50 per kg)	500	1,250
Direct labour (Rs.30 per hour)	750	1,500
Variable overhead	250	500

Total fixed overheads : Rs.10,00,000

Comment on the profitability of each product when :

(i) Total sales in value is limited.
(ii) Raw materials is in short supply.

(iii) Production capacity is the limiting factor.

(iv) Total availability of raw materials is 20,000 kg. And maximum sales potential of each product is 1,000 units, find the product mix to yield maximum profits.

22. A company produces three products. The cost data are as under :

		A	B	C
Direct Materials	Rs.	64	152	117
Direct labour :				
Dept.	Rate per hour Rs.	Hrs.	Hrs.	Hrs.
1	5	18	10	20
2	6	5	4	7
3	4	10	5	20
Variable Overheads		Rs.16	9	21
Fixed overheads		Rs.4,00,000 p.a.		

The budget was prepared at a time, when the market was sluggish. The budgeted quantities and selling price are as under :

Product	Budgeted Qty.	Selling Price (Rs.)/Unit
A	9,750	270
B	7,800	280
C	7,800	400

Later the market improved and the sales quantities could be increased by 20% for product A & 25% each for products B & C. The sales manager confirmed that the increased quantities could be achieved at the prices originally budgeted. The production manager stated that the output cannot be increased beyond the budgeted level due to limitation of direct labour hours in Department 2.

Required: (i) Present a statement of budgeted profitability
(ii) Set optimal product mix and calculate the optimal profit.

23. A company manufactures and markets three products X, Y and Z. All the three products are made from the same set of machines. Production is limited to 3,900 machine hours capacity. From the data given below, indicate the best product mix with a view to maximising profits :

		Products		
		X	Y	Z
Raw material cost per unit	(Rs.)	11.25	16.25	21.25
Direct labour cost per unit	(Rs.)	2.50	2.50	2.50
Other variable cost per unit	(Rs.)	1.50	2.25	3.55
Selling price per unit	(Rs.)	25.00	30.00	35.00
Standard machine time required p.u. in Minutes		39.00	20.00	28.00
Demand per month in units		2,000	3,000	4,000

24. M/s. Mars Ltd. are manufacturing three products. The cost details are as follows:

Particulars	Products A		B		C	
	Units	Rs.	Units	Rs.	Units	Rs.
Direct Materials	4	12	5	15	6	18
Direct Labour		5		6		6
Direct Expenses		8		9		11
		25		30		35
Selling Price		35		40		50
		10		10		15
No. of Units sold		20,000		40,000		20,000
Total Contribution		2,00,000		4,00,000		3,00,000
Total				Rs.9,00,000		
Less : Fixed Costs				Rs.7,50,000		
				Rs.1,50,000		

The direct materials were all imported. Due to foreign exchange restrictions, henceforth, the company can import only 3,00,000 units of raw materials. The company can produce in all 1,00,000 units maximum (all products).

However, they can market only 20,000 units of product A & C each. There is a local substitute material which is available at a price of Rs.3.75 per unit. Besides, the company has to spend Rs.50,000 on intermediaries and consumables, if local substitute material is used in the production process. There was also a third party who was willing to take a part of the plant on lease up to 50,000 units capacity of B and willing to pay lease changes of Rs.2,75,000.

You are required to advise the management :

(i) What should be the quantum of production/sales mix of products with existing import restrictions?

(ii) Whether the company can optimise production of 1,00,000 units with local substitute materials ?

(iii) Whether the company can enhance profits by leasing out a part of the plant to the third party and restricting its own production ?

25. A company manufactures three products. The budgeted quantity data are as under :

	A Rs.	B Rs.	C Rs.
Raw materials (@ Rs. 20 per kg.)	80	40	20
Direct wages (@ Rs. 5 per hour)	5	15	10
Variable overheads	10	30	20
Fixed overheads	9	22	18
Budgeted production in units	6,400	3,200	2,400
Selling price per unit in Rs.	140	120	90

Required :

(i) Present a statement of budgeted profit.

(ii) Set optimal product-mix and determine the profit, if the supply of raw materials is restricted to 18,400 kgs.

A supplier comes forward to supply 20,000 kgs. of raw materials at a premium of Rs. 15 per kg. This supply is over and above the stock of 18,400 kgs. available with the company. State whether the company should accept the entire quantity or any part of it. If not, what lowest price should be negotiated ?

26. A company has plans to manufacture five different types of product using a common raw material which is locally available according to requirements at Rs. 16 per kg. However skilled labour required for manufacture is in short supply and current availability is only 30,000 hours per month @ Rs. 20 per hour.

Variable production overheads amounts to Rs. 10 per hour and variable selling and distribution cost is 10% of sales value.

Total fixed costs of selling, distribution and administration is estimated to be Rs. 3,00,000 p. m.

Further details relating to the products are given below:

Product	Current demand	Selling price per unit (Rs.)	Raw material required (Kg./unit)	Direct labour required (hrs./unit)
A	8,000	100	2	1
B	6,000	120	2.5	1.2
C	5,000	160	3	2
D	3,000	220	4	3
E	2,000	300	5	4

Required:

(a) Contribution analysis statement showing the relative profitability of the products under:

(i) Normal conditions without any constraints on resources.

(ii) When skilled labour hours are in short supply.

(b) If the company decides to produce and sell even relatively less profitable products to meet at least 10% of the current demand, what revised plan will you suggest? What is the anticipated profit?

Decision-making on basis of Relevant Costs:

27. PQR Ltd. Manufactures medals for winners of athletic events and other contests. Its manufacturing plant has the capacity to produce 10,000 medals each month. The current domestic market price of the medal is Rs.150.

The cost data for the month of October, 2009 is as under :
Variable Costs (that vary with units produced)

	Rs.
Direct materials	2,62,500
Direct manufacturing labour	3,00,000
Variable Cost (that vary with number of batches) Setups; materials handling; quality control 150 batches x Rs.500 per batch	75,000
Fixed manufacturing costs	2,75,000
Fixed marketing cost	1,75,000
	Rs.10,87,500

PQR Ltd. Has received a special one-time-only order for 2,500 medals at Rs.100 per medal.

PQR Ltd. Makes medals for its existing customers batch size of 50 medals (150 batches x 50 medals per batch = 7,500 medals). The special order for 2,500 medals requires PQR Ltd. to manufacture the medals in 25 batches of 100 each.

Required:

i. Should PQR Ltd. Accept the special order ? Why ? Explain briefly.

ii. Suppose the plant capacity was 9,000 medals instead of 10,000 medals each month. The special order must be taken either in full or rejected totally. Should PQR Ltd. Accept the special order ? Why ? Explain briefly.

28. The present output details of a manufacturing department are as follows :

Average output per week	48,000 units from 160 employees
Saleable value of output	Rs.6,00,000
Contribution made by output towards fixed expenses and Profit	Rs.2,40,000

The Board of Directors plans to introduce more mechanisation into the department at a capital cost of Rs. 60,000 p.a. The effect of this will be to reduce the number of employees to 120. And increasing the output per individual employee by 60%.

To provide the necessary incentive to achieve the increased output, the Board intends to offer a 1% increase on the piece work rate of Re.1 per unit for every 2% increase in average individual output achieved.

To sell the increased output, it will be necessary to decrease the selling price by 4%.

Calculate the extra weekly contribution resulting from the proposed change and evaluate for the Board's information, the desirability of introducing the change.

29. The accounts of a company are expected to reveal a profit of Rs.14,00,000 after charging fixed costs of Rs.10,00,000 for the year ended 31st March, 2009. The selling price of the product is Rs.50 per unit and variable cost per unit is Rs.20.

Market investigations suggest the following responses to the price changes :

Alternatives	Selling Price reduced by	Quantity Sold increased by
I	5%	10%
II	7%	20%
III	10%	25%

Evaluate these alternatives and state which of the alternatives, on profitability consideration, should be adopted for the forthcoming year.

30. A company has prepared the following budget of Sales :

Product	Sales (Rs.)	PV Ratio (%)
A	6,00,000	40
B	9,00,000	30
C	10,00,000	25

The fixed cost amount to Rs. 8,00,000.

You are required to revise the sales mix to ensure a profit of Rs. 10,000 in such a way that not more than Rs. 8,00,000 of Sales of product A is possible and that the present total value of sales should not altered.

31. A company operates at 50% capacity when sale is Rs. 9,00,000.

At 100% capacity utilasetion following costs & relationship will apply-

Factory overhead Rs. 1,80,000 (50% variable).
Factory cost is 60% of sales.
Selling costs (75% variable) is 20% of sales.

The company anticipates that its sales will increase up to 75% of capacity utilization. The Co. also receives a special order from, a Government department. This order will occupy 15% of capacity utilisation of the plant.

The prime cost of this order is Rs. 1,35,000 and the variable selling cost will only be 2% of the sales value offered besides, the cost of processing the order Rs. 8,000. The sales price offered is Rs. 1,45,000.

Required;

(i) Present a statement of profitability at 50% and 75% levels of activity.

(ii) Evaluate the Government order and state whether it is acceptable or not.

32. A Company is producing an identical product in two factories. The following are the details in respect of both the factories:

	Factory X (Rs.)	Factory Y (Rs.)
Selling Price per unit	50	50
Variable cost per unit	40	35
Fixed Cost	2,00,000	3,00,000
Depreciation include in above	40,000	30,000
Sales (units)	30,000	20,000
Production Capacity (units)	40,000	30,000

You are required to determine:

(a) Which factory is more profitable?

(b) Cash BEP for each factory individually.

(c) BEP for company as a whole, assuming the product mix can be altered as desired.

(d) Consequences on profits and BEP if product mix is changed to 2:3 and total demand remain constant.

33. A company, which manufactures and sells three products, furnishes the following details for a month:

Products	A	B	C
No. of units budgeted	1,00,000	38,000	46,000
Selling price per unit Rs.	50	80	60
Variable costs per unit Rs.	34	52	24

It has been proposed that an intensive advertisement campaign involving an expenditure of Rs. 1,20,000 per month and reduction of selling prices will increase the sales of product C as under:

(i) If the selling price is reduced to Rs. 55 p.u., the sales will increase to 59,000 units p.m.
(ii) If the S.P. is reduced to Rs. 51 p.u., the sales will increase to Rs. 65,000 units p.m.

The fixed costs of the company amount to Rs. 34,20,000 per month.

Required:
(i) Calculate the current monthly break – even sales value of the company.
(ii) Evaluate the two proposals and advise which of the proposals should be implemented.

(iii) Calculate the sales units required per month of product C to justify the expenditure on advertisement in respect of your decision in (ii) above.

Budget

1. Definition

A budget is a financial and/or quantitative statement, prepared prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.

2. Objective of Budgets :-

(a) A budget is a blue print of the desired plan of action or operation.
(b) Budgets provide a means of co-ordination of the business as a whole .
(c) Budgets are means of communication.
(d) Budgets facilitate centralised control with delegated authority and responsibility.

3. Budgetary Control:

Budgetary control is defined as the establishment of budgets relating the responsibilities of executives to the requirements of a policy and the continuous comparison of actual with budgeted results, either to secure by individual action the objective of that policy or to provide a basis for its revision.

FUNCTIONAL BUDGETS

1. The following details apply to an annual budget for a manufacturing company :

Quarter	1st	2nd	3rd	4th
Working days	65	60	55	60
Production (units per working day)	100	110	120	105
Raw Material purchases (% by weight of annual total)	30%	50%	20%	--
Budgeted purchase price(per kg)	Rs.10	13	12	--

Quantity of raw material per unit of production : 2 kg.
Budgeted opening stock of raw material --4,000 kg for a cost of Rs. 40,000.
Budgeted closing stock of raw material : 2,000 kg. Issues are priced on FIFO basis.

Calculate the following budgeted figures :

(a) Quarterly and annual purchases of raw material by weight and value.
(b) Closing quarterly stocks by weight and value.

2. Gama Engineering Company Limited manufactures two products X and Y . An estimate of the number of units expected to be sold in the first seven months of 2009 is given below :

	Product X	Product Y
January	500	1,400
February	600	1,400
March	800	1,200
April	1,000	1,000
May	1,200	800
June	1,200	800
July	1,000	900

It is anticipated that :
(a) there will be no work-in-progress at the end of any month;

(b) finished units equal to half the anticipated sales for the next month will be in stock at the end of each month (including December, 2008).

The budgeted production and production costs for the year ending 31st December,2009 are as follows :

	Product X	Product Y
Production (units)	11,000	12,000
Direct materials per unit (Rs.)	12	19
Direct Wages per unit (Rs.)	5	7
Other manufacturing charges apportionable to each type of product (Rs.)	33,000	48,000

You are required to prepare :

(a) a production budget showing the number of units to be manufactured each month, and
(b) a summarized production cost budget for the 6 month period-January to June, 2009.

CASH BUDGETS

3. Prepare a Cash Budget for the three months ending 30th June 2009 from the information given below :

(a) Month

Month	Sales Rs.	Materials Rs.	Wages Rs.	Overheads Rs.
February	14,000	9,600	3,000	1,700
March	15,000	9,000	3,000	1,900
April	16,000	9,200	3,200	2,000
May	17,000	10,000	3,600	2,200
June	18,000	10,400	4,000	2,300

(b) Credit terms are :
Sales/Debtor - 10% sales are on cash. 50% of the credit sales are collected next month , the rest in the following month :

Creditors	Materials	2 months
	Wages	1/4 month
	Overheads	1/2 month

(c) Cash and Bank balance on 1st April, 2009 is expected to be Rs. 6,000.

(d) Other relevant information is :

(i) Plant and Machinery will be installed in February 2009 at a cost of Rs. 96,000. The monthly installments of Rs. 2,000 is payable from April onwards.

(ii) Dividend @ 5% on Preference Share Capital of Rs. 2,00,000 will be paid on 1st June.

(iii) Advance to be received for sale of Vehicles Rs. 9,000 in June.

(iv) Dividends from investments amounting to Rs. 1000 are expected to be received in June.

(v) Income tax (advance) to be paid in June, is Rs. 2,000.

4. Sri Ramesh has given the sales forecast for January to July 2009 and actual sales for November, December, 2008 were as under. With the other particulars given, prepare cash flow statement for five months January -May 2009.

			Rs.
Sales	November	2008	80,000
	December		70,000
	January	2009	80,000
	February		1,00,000
	March		80,000
	April		1,00,000
	May		90,000
	June		1,20,000
	July		1,00,000

a) Sales 20% cash 80% credit payable in the third month (January sales in March).
b) Variable expenses 5% on turnover time lag half month.
c) Commission 5% on credit sales payable in the third month
d) Purchases 60% of the sales of the third month.
e) Payment 3rd month of purchases.
f) Rent and other expenses Rs. 3,000 paid every month.

g) Other payments; Fixed Assets Purchase March Rs. 50,000
h) Taxes April Rs. 20,000
i) Opening Cash Balance Rs. 25,000

5. The January 1, cash balance of the Jay Company is Rs. 5,000. Sales for the first four months of the year are expected to be as follows : January, Rs. 65,000; February, Rs. 54,000; March, Rs. 66,000; and April, Rs. 63,000. On January 1 , uncollected amounts for November and December of the previous year, are Rs. 13,500 and Rs. 39, 150, respectively. Collections from customers follow this pattern; 55% in the month of sale, 30% in the month following the sale, 13% in the second month following the sale, and 2% uncollectible.

Materials purchases for December were Rs. 10,000. Forecast purchases for the coming year are :January, Rs. 12,500; February, Rs. 16,500; March, Rs. 13,000; and April, Rs. 14,000. Purchases are usually paid by the 10th of the month following the month of purchase. Other cash expenditures of Rs. 41,000 are forecasted for each month.

Calculate:
(I) Expected cash collections during February
(ii) Expected cash balance, February 1 (iii) Expected cash balance, February 28.

General problems

6. A company has compiled the following data for preparation of budget for 2009 :

		Products		
		A	B	C
Sales per month (Units)		8,000	4,000	6,000
		Rs. / Unit	Rs. / Unit	Rs. / unit
Selling price		40	80	100
Direct Materials		20	48	40
Direct Labour :				
Dept.	Rate/Hour (Rs.)			
1	5.00	5	10	20
2	4.00	8	4	12
Variable overheads		3	3	7
Fixed Overheads Rs. 1,50,000 per month				

After the Budget was discussed the following action plan was approved for improving the profitability of the company :

(i) Direct labour in department 1 which is in short supply should be increased by 15,000 hours by spending fixed overheads of Rs. 8,000 per month.

(ii) To boost sales, an advertisement programme should be launched at a cost of Rs. 10,000 per month.

(iii) The selling prices should be reduced by :
A : 2½% B : 8¾% C : 1%

(iv) The sales targets have been increased and the sales department has confirmed that the company will be able to achieve the following quantities of sales :

A : 12,000 units B : 6,000 units C : 10,000 units

Required :

(i) Present the original monthly budget for 2009.

(ii) Set an optimal product mix after taking the action plan into consideration and determine its monthly profit.

(iii) In case the requirement of direct labour hours of department 2 in excess of 40,000 hours is to be met by overtime working involving double the normal rate, what will be the effect of so working overtime on the optimum profit calculated by you in (ii) above.

7. P Ltd. Manufactures two products using one of material and one grade of labour. Shown below is an extract from the company's working papers for the next period's budget :

	Product A	Product B
Budgeted sales (unit)	3,600	4,800
Budgeted material consumption, per product (Kg)	5	5
Budgeted material cost Rs.12 per Kg.		
Standard hours allowed per product	5	4
Budgeted wage rate Rs.8 per hours		

Overtime premium is 50% and is payable, if a works for more than 40 hours a week. There are 90 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%; in addition the non productive downtime is budgeted at 20% of the productive hors worked.

There are twelve 5 day weeks in the budget period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be :

Product A 1,020 units : Product B 2,400 units; Raw material 4,300 kgs.

The target closing stock, expressed in terms of anticipated activity during period are : Product A 15 days sales; Product B 20 days sales; Raw material 10 days consumption.

Required :
Calculate the material purchases budget and the wages budget for the direct workers, showing the quantities and values, for the next period.

Standard Costing

1. What is a Standard Cost?

A Standard cost is a carefully predetermined unit cost which is prepared for each cost unit. It contains details of the Standard amount and price of each resource that will be utilised in providing the service or manufacturing the product.

2. Standard:

It is a benchmark measurement of resource usage, set in defined conditions. The definition goes on to describe a number of bases which can be used to set the standard, including:

- A prior period level of performance by the same organization;
- The level of performance achieved by comparable organizations;
- The level of performance required to meet organizational objectives.

3. What is variance analysis?

A variance is the difference between the expected standard cost and the actual cost incurred. A unit standard cost contains detail concerning both the usage of resources and the price to be paid for the resources.

Variance analysis involves breaking down the total variance to explain how much of it is caused by the usage of resources being different from the standard, and how much of it is caused by the price of resources being different for the standard.

Variance analysis are 2 types

1. **Cost variances**
   - a. **Variable cost Variance;** b. **Fixed cost variance**
2. **Revenue variances**
   - a. **on sales** b. **on margin**

Rules for variable costs variances

$T_1 \Rightarrow$ $\quad \text{COST VARIANCE} = SC \times \frac{AO}{SO} - AC$

$T_2 \Rightarrow$ $\quad = SC \times \frac{AO}{SO} - SR.AI + SR.AI - AC$

Problems:

1. The standard cost per unit for the product M is worked out on this basis :

Direct materials	1.5 tons	@ Rs.400 per ton.
Direct Labour	3.0 hours	@ Rs. 60 per hour.
Factory overhead	3.0 hours	@ Rs. 20 per hour.

Normal capacity is 2,00,000 direct Labour hours per mensum. The factory overhead rate is arrived at on the basis of a fixed overhead of Rs.10,00,000 p.m. and a variable overhead of Rs.15 per direct labour hour.

In the month of May, 50,000 units of the product was started and completed. An investigation of the raw material inventory account reveals that 78,000 tons of raw material were transferred in to and used by the factory during May. These goods cost Rs.420 per ton. 1,50,000 hours of Direct labour were spent during May at a cost of Rs.65 per hour Factory overhead for the month amounted to Rs.34,00,000 of which rs.10,50,000 was fixed. Compute all variances..

2. The following information is available from the records of Standcost Ltd. for October 2008 :-

			Rs.
Materials Purchased	:	10,000 pieces at Rs. 2.20 each	22,000
Materials Consumed	:	9,500 pieces at Rs. 2.20 each	20,900
Actual wages paid	:	2,480 hours at Rs. 2.50 per hour	6,200
Variable overhead incurred	:		3,000
Fixed Overhead Incurred	:		11,000
Fixed Overhead Budgeted	:		10,000

Units produced 900 units. These were sold at Rs. 50 per unit

Standard Rates and Price are:

Direct Material Rate	Rs. 2.00 per piece
Standard Input	10 pieces per unit
Direct Labour Rate	Rs. 2.00 per hour
Standard requirement	2.5 hours per unit
Variable overheads	Re.1 per hour
Fixed overheads	Rs. 4.00 per labour hour.

Compute Cost Variances for October 2008.

3. KPR Ltd. Operates a system of Standard costing in respect of one of its products which is manufactured within a single cost center. The Standard Cost Card of a product is an under:

Standard		Unit Cost (Rs.)
Direct Material	5 kgs @ Rs. 4.20	21.00
Direct labour	3 hours @ Rs. 3	9.00
Factory overhead	Rs. 1.20 per labour hour	3.60
	Total manufacturing cost	33.60

The production schedule for the month of June, 2007 required completion of 40,000 units. However 40,960 units were completed during the month without opening and closing Work-in-progress inventories.

Purchases during the month of June, 2007, 2,25,000 kgs of material at the rate of Rs. 4.50 per kg. Production and sales records for the month showed the following actual results:

Material used	2,05,600 kgs.
Direct labour 1,21,200 hours; cost incurred	Rs. 3,87,840
Total factory overhead cost incurred	Rs. 1,00,000
Sales	40,000 units

Selling price to be so fixed as to allow a mark-up of 20% on selling price.

Required:

(i) Calculate material variances based on consumption of material.
(ii) Calculate labour variances and the total variance for factory overhead.

(iii) Prepare Income statement for June 2007 showing actual gross margin.

(iv) An incentive scheme is in operation in the company whereby employees are paid a bonus of 50% of direct labour hour saved at standard direct labour hour rate. Calculate the Bonus amount.

Equivalent production

4. A processing company uses Standard Process Costing method. The Standard Process Cost Card is as follows :

		Rs. Per Kg. of Finished Product
Direct Material	2 kgs. @ Rs.10 per kg	20
Direct Labour-	3 hrs. @ Rs.20 per hrs.	60
Fixed Overheads	(Recovered on labour hours)	90
Total		170

Budgeted output for the period is 1,000 kgs. Actual production and cost data for the period are; :

Actual production out of new input 950 kgs. Transferred to Finished stock – 1,200 Kgs.

		Rs.
Direct material	2,900 kgs.	32,000
Direct labour	3,300 hrs.	68,000
Fixed overheads		88,000

Stocks :

Opening W.I.P. 250 Kgs. Degree of completion – Material – 100%, Labour & overheads – 60%.

Closing W.I.P. 450 Kgs., Degree of completion – Material – 100%, Labour & over heads – 20%.

The company uses FIFO Method for evaluation of stocks. Compute all Cost variances & show the Process Account.

5. company manufacturing two products uses standard costing system. The following data relating to October, 2009 have been furnished to you:

Products	A (Rs.)	B (Rs.)
Standard Cost per Unit:		
Direct Materials	2	4
Direct Wages	8	6
Fixed Overheads	16	12
Unit processed In process:		
Beginning of the month: All materials applied and 50% complete in respect of labour and overheads	4,000	12,000
End of the month : All materials applied and 80% complete in respect of labour and overheads	8,000	12,000
Units completed & transferred during the month	16,000	20,000

During the month, direct materials purchased at standard price amount to Rs. 2,00,000 and the actual cost of which is Rs. 2,20,000. Direct materials used for consumption at standard price amount to Rs.1,75,000.

Direct wages for actual hours worked at standard wage rates were Rs. 4,20,000 and at actual wage rates were Rs. 4,12,000. Fixed overheads budgeted were Rs. 8,25,000 and the actual fixed overheads incurred were Rs. 8,50,000. Calculate all the variances & standard cost of work-in-process at the end of the month.

MATERIAL VARIANCE ANALYSIS:

Remember : (for cost variances) Production = Output = Yield
Quantity = Input = Consumption

Material Cost Variances (MCV)

- **Material Price Variances (MPV)**
- **Material Usage Variance (MUV)**
  - **Material Mix Variance (MMV)**
  - **Material Yield Variance (MYV)**

Important:

1. **Prepare Cost Card;**
2. **Calculate variances separately for each Material.**
3. **If output is not given, consider it as one unit of output for material.**
4. **if input is given as % . consider standard input as = 100.**

Rules :

i) MCV = Standard Material Cost for actual production–actual material cost.

ii) MPV = (Standard Rate–Actual Rate) Actual quantity consumed.

iii) MUV = (Standard Consumption of actual output–Actual consumption) Standard Rate.

iv) MMV = (Total Actual Input in standard mix ratio–Actual Input) Standard Rate.

v) MYV = (Actual Output–Standard Output for Actual Input) Standard rate of Yield.

Check : (1) MPV + MUV = MCV & 2. MMV + MYV = MUV

Material Variances:

6. Modern Tiles Ltd. makes plastic tiles of standard size of 6" × 6" x 1/8". From the following information, you are required to calculate for direct materials variances:

A standard mix of the compound required to produce an output of 20,000 square feet of tiles 1/8" thick is as below:

Direct Material	Quantity	Price per kg.
A	kg. 5,000	Re. 0.85
B	2,900	0.60
C	4,400	0.45

Actual production for December was 6,20,000 tiles.

7. X Ltd. is producing floor cover in rolls of standard size measuring 3 meters wide 30 meters long by feeding raw materials to a continuous processing machine. Standard mixture fixed for a batch of 900 sq. mts. of floor cover is as follows:

2,000 kg. of material A at Re. 1.00 kg.
800 kg. of material B at Rs. 1.50/kg.
20 gallons of material C at Rs. 30.00/gallon.

During a period 1505 standard size Rolls were produced from materials issued for 150 batches. The actual usage and the cost of materials were:

3,00,500 kg. of material A at Rs. 1.10/kg.
1,19,600 kg. of material B at Rs. 1.65/kg.
3,100 gallons of material C at Rs. 29.50/gallon.

Present the figures to Management showing the break-up of Material Cost Variances arising during the period.

8. From the particulars given below, compute : Material Price Variance, Material Usage Variance, Labour Rate Variance, Idle Time Variance and Labour Efficiency Variance with full working details :

1 tonne of material input yields a standard output of 1,00,000 units. The standards price of material is Rs.20 per kg. Number of employees engaged is 200. The standard wage rate per employee per day is Rs.6. The standard daily output per employee is 100 units. The actual quantity of material used is 10 tonnes and the actual price paid is rs.21 per kg. Actual output obtained is 9,00,000 units. Actual number of days worked is 50 and actual rate of wages paid is Rs.6.50 per day. Idle time paid for and included in above time is 12 day.

9. A company produces a finished product by using three basic raw materials. The following standards have been set-up for raw materials :

Materials	Standard-Mix in percentage	Standard price per kg. in Rs.
A	25	4
B	35	3
C	40	2

The standard loss in process is 20% of input. During a particular month, the Company produced 2,400 kgs of finished product. The details of stock and purchases for the month are as under :

Material	Opening Stock (kgs)	Closing Stock (kgs.)	Purchases during the month Quantity in kgs	Cost in Rs.
A	200	350	800	3,600
B	150	200	1,000	3,500
C	300	200	1,100	1,980

The opening stock is valued at standard cost. Complete:

(i) Materials price and Material cost variances, when:
  (a) Variance is calculated at the point of issue on "First-in-First-out' basis
  (b) Variance is calculated at the point of issue of 'Last-in-First-out' basis

(ii) Materials usage variance,
(iii) Material Mix variance, and
(iv) Material yield variance.

10. Compute the missing data indicated by the Question Marks from the following :

Particulars	A	B
Standard Price/Unit	Rs. 12	Rs. 15
Actual Price/Unit	Rs. 15	Rs. 20
Standard Input (kgs)	50	?
Actual Input (kgs.)	?	70
Material Price Variance	?	?
Material Uses Variance	?	Rs. 300 Adverse
Material Cost Variance	?	?

Total Material mix variance was Rs. 45 adverse.

Labour Variances:

Labour Cost Variance

Rate of Pay Variance (RPV) | **Idle Time Variance(ITV)** | **Labour Efficiency Variance(LEV)**

Labour Efficiency Variance(LEV) → **Labour Mix Variance(LMV)** / **Labour Gang Variance(LGV)**; **Lab. Yield Variance (LYV)** / **Lab Output variance(LOV)**

In presence of idle time actual hour = Revised actual time + Idle Time. If output is not given , apply the definitions of Standard hours i.e. one labour hour = one unit

Rules :

i) LCV = Standard Labour Cost for actual production – Actual Labour Cost
ii) RPV = (Standard Rate – Actual Rate) Actual Hours worked.
iii) ITV = Actual Idle Time x Standard Rate. (Note : This is always an adverse variance.)
iv) LEV = (Standard Time for actual production – RAT) Standard Rate.
v) LMV = (Total Rate in standard time ratio – RAT) Standard Rate.
vi) LYV = (Actual production – Standard production during RAT) Standard Rate of Yield i.e. Std. cost/Std. production

check. i) RPV + ITV + LEV = LCV & ii) LGV + LOV = LEV.

Problem

11. The standard output of product 'EXE' is 25 units per hour in manufacturing department of a company employing 100 workers. The standard wage rate per labour hour is Rs.6.

In a 42 hour week, the department produced 1,040 units of "EXE' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rate actually paid were Rs.6,20, Rs.6 and rs.5.70 respectively to 10, 30 and 60 of the workers.
Compute relevant variance.

12. The standard & actual labour component engaged in a week for a job are under :

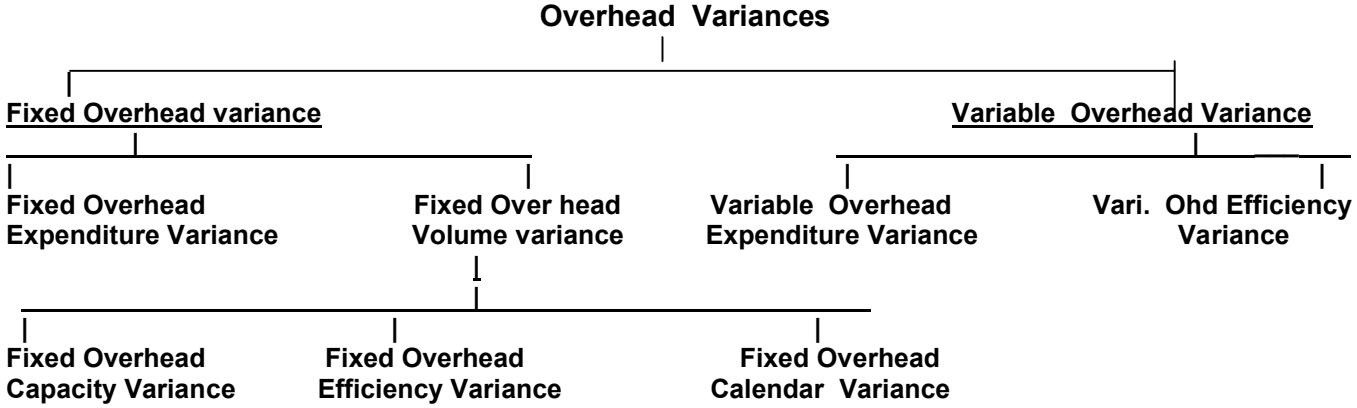
	Skilled workers	Semi-skilled workers	Unskilled workers
(a) Standard number of workers in the gang	32	12	6
(b) Standard wage rtes per hour (Rs.)	3	2	1
(c) Actual number of workers employed in the gang during the week	28	18	4
(d) Actual wage rate per hour (Rs.)	4	3	2

13. During the 40-hour working week, the gang produced 1,800 standard labour hours of work. 200 hours of Skilled labour are getting a overtime premium of 150%. 30 hours of unskilled labour were lost due machine breakdown & treated as abnormal idle time. Calculate the different labour variances. A gang of workers normally consists of 30 men, 15 women and 10 boys. They are paid at standard hourly rates as :

Men	Re. 0.80
Women	Re. 0.60
Boys	Re. 0.40

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output.
During the week ended 31st December 1997, the gang consisted of 40 men, 10 women and 5 boys. The actual wages paid were @ Re. 0.70, Re. 0.65 and Re. 0.30, respectively. 4 hours were lost due to abnormal idle time and 1,600 units were produced. Calculate the variances

Overhead Variances: Always calculate overhead recovery or absorption rates on basis of budgeted activity level i.e. normal capacity. If nothing mentioned about the nature of overhead always consider it as fixed overhead.



Rules for Fixed Overhead :

a) Fixed Overhead Cost Variance = Standard Fixed Overhead for actual production – actual fixed overhead.

b) Fixed Overhead Expn. Variance = Standard Fixed Overhead – Actual Fixed Overhead.

c) Fixed Overhead Volume Variance = (Actual Output – Standard Output) Standard rate/output.

d) Fixed Overhead Capacity Variance = {Actual hrs worked – Installed Capacity} Standard rate/hour.

e) Fixed Overhead Efficiency Variance = (Actual Number of days – Budgeted Number of days) Std rate/day.

Installed Capacity = Actual no. of days × Std. hours per day.

Checks : (1) a = b + c (2) c = d + e + f

Note: Calculate Overhead Recovery Rates on the Basis of Budgeted Hours, Units & Days.

VARIABLE OVERHEAD : **Rules for Variable Overhead**

a) Variable Cost Variance = (Std. Variable Overhead for actual production – Actual Variable Overhead).

b) Variable OHD Expen Variance = (Std. Variable Overhead for actual hr. worked – Actual Variable Overhead).

c) Variable OHD Efficiency Variance = (Std. time for actual production – Actual time taken) Std. rate/hour/min/day.

Check : a = b + c

14. A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at Rs.1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.

In April, 2009, the company worked 24 days of 840 machine hours per day and production 5,305 units of output. The actual fixed overheads were Rs.1,42,000.

Compute :

(i) Efficiency variance (ii) Capacity variance
(iii) Calendar variance (iv) Expense variance
(v) Volume variance (vi) Total fixed overheads variance.

15. A company has normal capacity of 100 machines working 8 hours per day of 25 days in a month. The budgeted fixed overheads of a month are Rs. 1,50,000. The standard time required to manufacture one unit of product is 4 hours. In a particular month, the company worked for 24 days of 750 machine hours per day and produced 4,500 units of the product. The actual fixed overheads incurred were Rs. 1,45,000 compute :

(a) Efficiency variance, (b) Capacity variance, (c) Calendar variance, (d) Expenditure variance, (e) Volume variance and (f) Total fixed overhead variance.

16. The following data is given :

	Budget	Actual
Production (in units)	400	360
Man hours to produce above	8,000	7,000
Variables overheads (in Rs.)	10,000	9,150

The standard time to produce one unit of the product is 20 hours.

Calculate variable overhead variances and give necessary journal entries to record the transactions.

17. The following information has been extracted from the books of Goru Enterprises which is using standard costing system:

Actual output	=	9,000 units
Direct wages paid	=	1,10,000 hours at Rs. 22 per hours of which 5,000 hours, being idle time, where not recorded in production
Standard hours	=	10 hours per unit
Labour efficiency variance OH	=	Rs. 3,75,000 (A)
Standard Variable OH	=	Rs. 150 per unit
Actual variable OH	=	Rs. 16,00,000

You are required to calculate:
(i) Idle time variance
(ii) Total variable overhead variance
(iii) Variable overhead expenditure variance
(iv) Variable overhead efficiency variance.

18. Calculate Efficiency and Capacity ratio from the following figures:

Budgeted production	80	units
Actual production	60	units
Standard time per unit	8	hours
Actual hours worked	500	

Multi-product with common input problems

19. From the data given below, calculate the MUV & MPV on purchase :

	X		Y	
	Qty. kg	Value Rs.	Qty. kg	Value Rs.
Raw Material Purchased	2,000	4,000	5,000	6,250
Issues to works stock	2,150	-	3,950	-
Works stocks of material :				
Opening	300	-	1,000	-
Closing	200	-	1,250	-
Standard price :	Rs. 1.90 per kg.		Rs. 1.30 per kg.	Output
Standard usage : Product A	1 kg.		1 kg	1,130 units
Product B	0.5 kg		1.kg.	2,550 units

Missing Figure Problems

20. The details regarding a food product manufactured by ABC Co. for the last one week are as follows :

Standard Cost (For one unit)		Rs.
Direct Materials	10 units @ Rs.1.50	15
Direct Wages	5 hours @ Rs.8	40
Production Overheads	5 hours @ Rs.10	50
		105

Actual (For whole activity)			
Direct Materials	Rs.	6,435	
Direct Wages	Rs.	16,324	
Analysis of Variances			
Direct Materials			
Price	Rs.	585	(Adverse)
Usage	Rs.	375	(Favourable)
Direct Wages (Labour)			
Rate	Rs.	636	(Favourable)
Efficiency	Rs.	360	(Adverse)
Production Overheads			
Expenditure	Rs.	400	(Favourable)
Volume	Rs.	750	(Favourable)

You are required to calculate :

(i) actual output units;
(ii) actual price of material per unit;
(iii) actual wage rate per labour hour;
(iv) the amt of prod. overhead incurred &
(v) the production overhead efficiency variance

21. A factory manufactures two products A & B in 2 production departments X and Y, The standard costs are:

Production Department		X	Y
Standard wage rate per hour		Rs.3	Rs.4
Labour cost per unit	Product A	3	5
	Product B	4	4

During a month of 200 hours:

Actual wages paid (Rs.)		92,000	1,30,000
Production in units	product A	8,000	11,000
	Product B	15,000	16,000

Throughout the period, the departments X and Y employed 150 and 160 direct workers respectively. In the department Y all workers are idle for 5 hrs due to accident during this period. Show LEV & LRV .

22. The standard cost card for a unit of product manufactured by a company is as under ;

Direct materials-	20 kg. @ Rs. 1.20	Rs. 24
Direct wages-	6 hrs. @ Rs. 6.00	Rs. 36
Overheads-	6 hrs. @ Rs. 2.00	Rs. 12

Profit margin is 20% of the selling price. Budgeted sales Rs. 54,000 per month. Actual data relating to April 2009 :

Sales	Rs. 46,750
Direct materials used	Rs. 15,000
Direct wages paid	Rs. 21,175

Analysis of variances : (in Rs.)		Favorable	Adverse
Direct materials	Price	...	600
	Usage	...	1,200
Direct wages	Rate	...	3,025
	Efficiency	1,650	...
Overheads	Expenditure		200 ...
	Volume	...	600

You are required, from the data given to calculate the
i) Actual output (ii) Actual profit (iii) Actual price per kg. of material (iv) Actual rate per direct labour hour v) Amount of overheads absorbed (vi) Budgeted output (vii) Overheads capacity variance (viii) Overheads efficiency variance (ix) Sales price variance (x) Sales volume profit variance.

Computation of All variances

23. The budgeted production of a company is 20,000 units per month. The standard cost sheet is as under:

Direct materials	1.5 kg @ Rs. 6 per kg.
Direct labour	6 hrs @ Rs. 5Per hour
Variable overheads	6 hrs @ Rs. 4 per hour
Fixed overheads	Rs. 3 per unit
Selling price	Rs. 72 p.u.

The following are the actual details for the month:

Actual production and sales 18,750 units. Direct materials consumed 29,860 kg at Rs. 5.25 per kg. Direct labour hrs worked 1,18,125 hrs at Rs. 6 per hour Actual overheads were Rs. 5,65,000 out of which a sum of Rs. 40,000 was fixed. There is no change in the selling price.

Calculate:

(i) Direct materials usage and price variances
(ii) Direct labour efficiency and rate variances
(iii) Variable overheads efficiency and expenses variances
(iv) Fixed overheads volume and expenses variances
(v) Sales volume variance in sales value and gross margin.

24. A company uses standard costing system. The sales data for a period are as under :

Production	Budgeted Sales Units	Budgeted Selling Price Per Unit Rs.	Actual Sales Units	Actual Sales Value Rs.
A	1,280	20	650	12,350
B	3,200	12	3,900	50,700
C	1,920	16	1,950	29,250

The cost data are as under :

		A	B	C
Standard Cost Per Unit	Rs.	16	10	13
Actual Cost Per Unit	Rs.	18	12	13

You are required to calculate the following for the period :

(i) Gross Margin Total Sales Variance.
(ii) Gross Margin Sales Volume Variance.
(iii) Gross Margin Sales Mix Variance.
(iv) Gross Margin Sales Quantity Variance.
(v) Sales Price Variance.
(vi) Total Cost Variance.

25. KPR Ltd. Operates a system of Standard costing in respect of one of its products which is manufactured within a single cost center. The Standard Cost Card of a product is an under:

Standard		Unit Cost (Rs.)
Direct Material	5 kgs @ Rs. 4.20	21.00
Direct labour	3 hours @ Rs. 3	9.00
Factory overhead	Rs. 1.20 per labour hour	3.60
	Total manufacturing cost	33.60

The production schedule for the month of June, 2007 required completion of 40,000 units. However 40,960 units were completed during the month without opening and closing Work-in-progress inventories.

Purchases during the month of June, 2007, 2,25,000 kgs of material at the rate of Rs. 4.50 per kg. Production and sales records for the month showed the following actual results:

Material used	2,05,600 kgs.
Direct labour 1,21,200 hours; cost incurred	Rs. 3,87,840
Total factory overhead cost incurred	Rs. 1,00,000
Sales	40,000 units

Selling price to be so fixed as to allow a mark-up of 20% on selling price.

Required:
(v) Calculate material variances based on consumption of material.
(vi) Calculate labour variances and the total variance for factory overhead.
(vii) Prepare Income statement for June 2007 showing actual gross margin.
(viii) An incentive scheme is in operation in the company whereby employees are paid a bonus of 50% of direct labour hour saved at standard direct labour hour rate. Calculate the Bonus amount.

Flexible Budget & Standard

26. The Managing Director of your company has been given the following statement showing the results for August 2009.

Month ending 31st August, 2009

	Master Budget	Actual	Variance
Units produced and sold	10,000	9,000	(1,000)
	Rs.	Rs.	Rs.
Sales	40,000	35,000	(5,000)
	Rs.	Rs.	Rs.
Direct materials	10,000	9,200	800
Direct wages	15,000	13,100	1,900
Variable overhead	5,000	4,700	300
Fixed overhead	5,000	4,900	100
Total cost	35,000	31,900	3,100
Net profit	5,000	3,100	(1,900)

Figures in parentheses indicate adverse variances.

The standard costs of the product are as follows :

	Per unit Rs. P
Direct materials (1 kg. @ Re 1 per kg.)	1.00
Direct wages (1 hour @ Rs. 1.50)	1.50
Variable overhead (1 hour @ Re 0.50)	0.50

Actual results for the month showed that 9,800 kg. of materials were used and 8,800 labour hours were recorded.

Required :
(a) Prepare a flexible budget for the month and compare with actual results ; and
(b) Calculate the variance which have arisen.

27. A company making a single standard product produces accounts for costing period as follows :

Direct Materials	3,960	Direct Wages	5,960
Variable Overheads	9,700	Fixed Overheads	5,200
Profit	4,880	Sales	29,700

The original budget was for 1,000 units per period, but during this period only 960 units were produced and sold. Standard direct wages rate is Rs. 6 per unit and standard variable overhead rate is Rs.10 per unit. Cost variances during this period were :

	Gains (Rs.)	Losses (Rs.)
Material Price	--	40
Material Usage	--	80
Wage Rate	100	--
Labour Efficiency	--	300
Variable Overhead Price	400	--
Variable Overhead Efficiency	--	500
Fixed Overhead Cost	--	200
Selling Price	900	--

Prepare for the period the original budget and budgeted cost of actual sales.

Count Down: (require concept of more than one chapter)

1. A factory incurred the following expenditure during the year 2007:

		Rs.
Direct Material consumed		12,00,000
Manufacturing wages		7,00,000
Manufacturing overhead:		
Fixed	3,60,000	
Variable	2,50,000	6,10,000
		25,10,000

In the year 2008 following changes are expected in production and cost of production:

(i) Production will increase due to recruitment of 60% more workers in the factory.
(ii) Overall efficiency will decline by 10% on account of recruitment of new workers.
(iii) There will be an increase of 20% in Fixed overhead and 60% in Variable overhead.

(iv) The cost of direct material will be decreased by 6%.
(v) The company desire to earn a profit of 10% on selling price.

Ascertain the cost of production and selling price.

2. Following costs were incurred in producing 800 M. T. of M. S. Rods :

	Rs.
Materials	2,80,000
Labour	1,00,000
Processing Charges	1,00,000
Total Cost	4,80,000

Of the total output, 10% was defective and had to be sold after a discount of 10% off the normal price. The scrap arising out of the production realised a sum of Rs. 8,760. The sale price in calculated to yield 15% profit on sales. You are requested to find out the normal price as well as the discounted price of per M. T. of M. S. Rods.

3. A Re-roller produced 400 metric tonnes of M.S. bars spending Rs. 36,00,000 towards materials & Rs. 6,20,000 towards rolling charges. 10% of the output was found to be defective, which had to be sold at 10% less than the price for good production. If the sales realization should give the firm an overall profit of 12.5% on cost, find the selling price per metric tonne of both the categories of bars. The scrap arising during the rolling process fetched a realization of Rs. 60,000.

4. Your management has been advised on certain matters relating to materials as under :
State your views on the advice given to the management

(a) To buy materials always from a source quoting the lowest price given that quality to be supplied by all sources meets the specifications.

(b) FIFO method of pricing issues has to be followed when prices are continuously rising.

(c) Accuracy in cost computations and analysis is very essential for cost control and management decisions.

(d) There is difference between average inventory and inventory turnover.

(e) Jute bags holding cement are shown under distribution costs.

(f) Products should be priced on the basis of total costs only in times of depression.

5. M/s Precision Works having a capacity of 4,800 tonnes per annum manufactures a product which passes through two Production Departments A and B. The sales forecast for the next financial year envisages full utilisation of production capacity in the following customer-mix :
Customer P: 3,000 tonnes @ Rs. 1.50 lakhs/tonne
Customer Q: 1,800 tonnes @ Rs. 2.00 lakhs/tonne

Over the years the Company has established three possible sources of raw material supplies as under :
SupplierX: is prepared to supply 3,600 tonnes of input materials @ Rs. 0.60 lakh/tonne

SupplierY: offers to supply 4,000 tonnes of input materials @ Rs. 0.55 lakh/tonne
SupplierZ: agrees to supply @ Rs. 0.65 lakh/tonne only if the entire input requirement is taken from him but offers a discount of 5%.
The cost of transport for bringing the input materials from suppliers' point is as under :

Supplier	X:	Rs. 0.02 lakh/tonne to be spent by M/s Precision Works.
Supplier	Y:	Rs. 0.03 lakh/tonne to be spent by M/s Precision Works
Supplier	Z:	the transport cost is to be paid by the supplier.

The average level of scrap arising from the two production departments A and B are 5.0% and 10.0% respectively calculated on the final output. The realisable value of scrap sold out is Rs. 0.225 lakh /tonne for Department A and Rs. 0.200 lakh/tonne for Department B. This realisation is credited to the cost of production.

Budgets for the departmental cost for the next year are as under :

	Dept. A	Dept. B
Direct Labour	Rs. 416.00 lakhs	Rs. 748.00 lakhs
Overheads	Rs. 964.00 lakhs	Rs. 414.00 lakhs

Based on the above data, you are required to work out the following :
(a) Gross quantity of input material required to be procured.
(b) Selection of the source of procurement and the price at which this inputs are to be procured.
(d) Total profitability for next year assuming a distribution cost of 15% on cost of production.

6. Explain how to deal with the following in the cost account. Each answer should be in two or three sentences only, showing also the appropriate journal entry, wherever necessary.

(a) A shortage of 10kg. of a store item (book value Rs.150) was noticed during physical verification. Investigations revealed that it was due to natural causes.

(b) An abnormal gain of Rs.42,000 was noticed in process "A" of a chemical factory at the end of a month.

(c) A sum of Rs.1,500 was realised sale of saw dust and useless scantlings in a furniture making business.

(d) In a factory, using historical cost system, there was an under-recovery of fixed factory overheads amounting to Rs.24,000 at the end of the accounting period.

(e) A company spent Rs.15 lakhs on advertisement in the national television network before launching a new product.

(f) A sum of Rs.20,000 was incurred on printing and stationery in connection with the issue of non-convertible debentures by a company.

(g) A sum of Rs.7,500 was paid as wages to workers in a factory when there was no work due to power failure.

(h) Overtime wages amounting to Rs.500 was incurred to meet an urgent order of a customer who wanted the delivery date to be advanced.

7. A factory following the Job Costing Method. An abstract from the work in process as at 30th September was prepared as under:

Job No.	Material		Direct Labour	Factory Overhead Applied
115	Rs. 1,325	400 hours	Rs. 800	Rs.640
118	810	250 hours	500	400
120	765	300 hours	475	380
	2,900		1,775	1,420

Materials used in October were as follows:

Material Requisition No	Job No	Cost Rs.
54	118	300
55	118	425
56	118	515
57	120	665
58	121	910
59	124	720
		3,535

A summary of Labour Hours deployed during October

Job No	Number of Hours	
	Shop A	Shop B
115	25	25
118	90	30
120	75	10
121	65	-
124	20	10
	275	75
Indirect Labour:		
Waiting for Material	20	10
Machine Breakdown	10	5
Idle Time	5	6
Overtime Premium	6	5
	316	101

A shop credit slip was issued in October, that material under requisition No. 54 was returned back to stores as being not suitable. A material Transfer Note issued in October indicated that material issued under requisition No. 55 for Job 118 was directed to Job 124.

The hourly rate in Shop A per labour hour is Rs. 3 per hour while at Shop B it is Rs. 2 per hour. The factory overheads applied at the same rate as in September. Jobs 115, 118 and 120 were completed in October.

You are asked to compute the factory cost of the completed jobs. It is the practice of the management to put a 10% on the Cost of production to cover administration and selling overheads and invoice the job to the customer on a total cost-plus 20% basis. What would be the invoice price of these three jobs.

8. A company has the option to procure a particular material from two sources :

Source I assures that defectives will not be more than 2% of supplied quantity.

Source II does not give any assurance, but on the basis of past experience of supplies received from it, it is observed that defective percentage is 2.8%.

The material is supplied in lots of 1,000 units. Source II supplies the lot at a price, which is lower by Rs. 100 as compared to Source I. The defective units of material can be rectified for use at a cost of Rs. 5 per unit.

You are required to find out which of the two sources is more economical.

9. Witco PLC produces two products X and Y. The manufacturing division consists of two producing (designated 1 and 2) and two service (designated 3 and 4) departments. The company uses a absorption costing system & predetermined overhead rates are used in the producing departments to absorb factory overhead to the products.

The rate for Dept. 1 is based on direct machine hours (DMH) and the rate for Dept. 2 is based on direct labour hours (DLH). The following budget and actual data are available :
Annual profit plan data...

(i) Factory Overhead budgeted for the year Dept. 1 Rs. 8,50,000, Dept. 2 Rs. 7,25,000, Dept.- 3 Rs. 2,00,000 Dept.4. Rs. 1,50,000. Machine operators salaries are treated as overhead costs.

(ii) Budget units to be produced : product X: 50,000 ; Y: 30,000

(iii) Budgeted raw material cost per unit of product (all used in Dept.-I) Product X Rs. 40. Product Y Rs. 50. No materials is added in Dept. 2.

(iii) Budgeted time required for production : direct machine hours in Dept. 1 for each unit of finished goods produced X – 1.5 , Product Y – 1.0 .

(iv) Direct labour hours in Dept. 2 for each unit of finished goods. Product X - 2 hrs; Product Y – 2.5 hour.

(v) Average wage rates budgeted in Dept. 2, Product X Rs. 24 hr. and Product Y Rs. 25 per hr.

(vi) Allocation of service dept. cost to producing Depts.
Dept. 3 allocates ½ to Dept. 1 and ½ Dept. 2;
Dept. 4 allocates 2/3 to Dept. 1 and 1/3 to Dept. 2

<u>January actual data :</u>

a. Units actually produced & in January – Product X 4,000 ; Y 3000
There was no opening stock of finished goods. Actual Sales for the month: X- 3,900 & Y- 2,860 units at price so fixed earlier.

b. Actual direct machine hours in Dept. 1 Product X 6,100; Product Y 4,150

c. Actual Costs incurred :

Dept.	Overhead	Raw material	Direct Hours	Labour Amount
1.	Rs. 77,000	X Rs. 1,63,000 Y Rs. 1,52,000		
2.	Rs. 68,000		X 8,200 Y 7,400	Rs. 1,97,300 Rs. 1,84,000
3.	Rs. 20,000			
4.	Rs. 16,000			

You are required to prepare a Performance report on the basis of budget cost & actual cost i.e. compute the budgeted cost for actual output and actual cost during month of January.

10. Spun Tube Co. can produce tubes of 4 different diameters, D_1, D_2, D_3 & D_4 all of the same length on the same equipment producing only one size every day. The following information is available in respect of the year just completed.

Tube	Produced Diameters	sold diameters	Year end stock Meters	Mat. Weight in kgs. per 100 Meters	total Weight in kgs.	Average Production per day (metres)	selling price for metre Rs.
D_1	1,12,000	1,05,000	7,000	40	2,800	1,400	9.00
D_2	1,47,000	1,40,875	6,125	50	3,063	1,225	11.00
D_3	1,05,000	99,750	5,250	65	3,413	1,050	15.00

(i) There were no opening stock of inventories
(ii) The size D_4 was not produced at all
(iii) Technical specification of D_4 are : 875 meters can be produced on an average per day. Weight per 100 metres of this tube will be 80 kgs. And this can be sold at Rs. 18 per meter.

A suitable grouping of the profit and Loss Account of the year is also reproduced below:

Sales (including Miscellaneous income)		Rs. 41,37,000
Raw material	Rs. 14,36,850	
Direct Labour	7,50,000	
Variable overhead	3,50,000	
Fixed overhead	8,50,000	
Inventory : Raw materials		1,31,000
Finished goods		1,62,426
Profit	10,43,576	
	44,30,426	44,30,426

You are required to calculate :

(i) The total cost of each size of tube per metre basis.
(ii) The value of finished goods stock at the end of the year at cost as under (i)

(iii) To profitability of each size of tube, and
(iv) To calculate profit for the size D_4 per metre length.

Note : The direct materials cost per kg. of the finished tube is found to be the same for all sizes. The expenses were uniform throughout the year.

11. Prepare an estimated cost sheet based on the following data and consider the price that you would quote for an export order of 25,000 pcs.

Raw Materials : 10,000 kg. @ Rs. 6.95 per kg.
Direct Labour : 15,000 hours normal @Rs.2/hour, 25% overtime @200% premium.
Factory overheads : 80% of direct wages.
Selling & distribution cost : 60% of direct wages.

Additional Fixed capital investment to be made: Rs. 50,000 Normal net return on capital Employed expected: 25%. Increase in working capital: 20% of the sales value.

Short notes, Distinguish between & Treatments

1. Define Product costs. Describe three different purposes for computing product costs.

Product costs are attributable costs. These are the costs, which are assigned to the product. Under marginal costing variable manufacturing costs and under absorption costing, total manufacturing costs constitute product costs.

The three different purposes for computing products costs are as follows :

i. Preparation of financial statements : Here focus is on attributable costs.

ii. Product pricing : It is an important purpose for which product costs are used. For this purpose, the cost of the areas along with the value chain should be included to make the product available to the customer.

iii. Contracting with government agencies : For this purpose government agencies may not allow the contractors to recover research and development and marketing costs under cost plus contracts.

2. How does a Production Account differ from a Cost Sheet.

1. Production Account is based on double entry system whereas cost system whereas cost sheet is not based on double entry system.

2. Production Account consists of two parts. The first part shows cost of the components and total production cost. The second part shows the cost of sales and profit for the period. Cost sheet presents the elements of costs in a classified manner and the cost is ascertained at different stages such as prime cost; works cost; cost of production; cost of goods sold; cost of sales and total cost.

3. Production account shows the cost in aggregate and thus facilitates comparison with other financial accounts. Cost sheet shows the cost in detail and analytical manner which facilitates comparison of cost for the purpose of cost control.

4. Production account is not useful for preparing tenders or quotations. Estimated cost sheets can be prepared on the basis of actual cost sheets and these are useful for preparing tenders or quotations.

3. Scrap Accounting :

Accounting treatment of scrap depends on the realisable value.

Where value of scrap is negligible, absorb the cost and the realised amount from sale of scrap will be treated as other income.

When value of scrap is significant and identifiable with job or process, the cost will be transferred to scrap account and the realisation from sales will be credited to job or process account. The difference will be transferred to costing profit and loss account.

When value is significant, but scraps are not identified with particular job or process the net realisation after deducting selling cost is transferred to either overheads or material account to reduce the overhead rate or material cost respectively.

Control of scrap :

Scrap control starts from the designing of product and process. Efforts shall be made to maximise utilisation of material and minimum wastage of material in the processing. A standard allowance for scrap should be fixed and actual should be compared against it. A periodical report indicating type of scrap, nature of product, good production units, scrap units – actual and normal, % scrap to good units and standard allowance % and value of scrap, etc. should be prepared from the data collected at the shop level, and placed before the Departmental Head for review and remarks.

4. Spoilage :
Accounting :

Cost of normal spoilage which is inherent in the operation is absorbed by charging either to the production order or to production overheads. Cost of abnormal spoilage arising out of causes not natural to the manufacturing process is charged to costing profit and loss account. As regards charge to production there are two methods –

Identifying loss arising out of spilage, and

Absorbing in the value of good units so that spoilage quantity or value is not identified.

If spoiled units are reused as raw material in the same manufacturing process, no separate accounting treatment is required. On the other hand, if spoilage is used for any other process or job, a proper credit should be given to relevant process account or job account.

Control :
Control of spoilage is exercised by setting standards, fixation of responsibility and systematic reporting.

5. Waste :
Accounting :

Good units should absorb the cost of waste. However, if any value is realised, the process account concerned may be credited. Cost of abnormal waste should be excluded from the total cost and charged to the costing profit and loss account.
Control :

Control is exercised over the quantum of waste arising in a process or operation usually through standard set for the normal percentage of visible and invisible wastes that may be anticipated to arise in various manufacturing processes or operations.

In order to keep a control on waste, a periodical report should be prepared by each department indicating (a) Nature of waste, (b) Quantity of waste generated, (c) Value, if any, and (d) Percentage comparison between normal and actual waste. Control action consists of review by departmental head and corrective action is taken especially if wastage is abnormal.

6. Defective :
Accounting :

Cost of defectives includes reprocessing expenses such as material, labour, direct expenses which will add to the cost of job or process as a direct expense.

However, if the expense is not identifiable with the particular job or process and the amount is not significant, the total expenses shall be collected by way of a standing order number, and

charged to the departmental overheads or general overheads. If defectives are abnormal and are due to causes beyond the control of the organisation; say, power failure at the time of reworking the cost of rework should be debited to costing profit and loss account. It should be noted that cost of remedying imperfection is not the cost of the particular job, on which the defective work was discovered. The cost of defective work is considered as an item of manufacturing overhead.

Control :

Effective control has to be exercised on the physical units of defectives as well as on the cost of salvaging. Best way is to fix standard or norms for defectives and rework and rectification costs and compare actual against them.

7. Small tools:

These are mechanical appliances used for various operations on work place, specially in engineering industries. Such tools drill bits, chisels, screw cutter, files etc.

Treatment of cost of small tools of short effective life :

(i) Small tools purchased may be capitalized and depreciation over life if their life is ascertainable. Revaluation method of depreciation may be used in respect of very small tools of short effective life. Depreciation of small tools may be charged to :
   -- Factory overheads
   -- Overheads of the department using the small tool

(ii) Cost of small tools should be charged fully to the departments to which they have been issued, if their life is not ascertainable.

8. Bad Debts :

Bad debts occur when some of the debtors fails to honour the commitments to pay. So the organization suffers a loss in the sense that they do not receive the price for goods sold or services rendered.
Bad debts are usually considered part of selling and distribution overhead. It is also a debatable point in the sense that some accountants feel that bad debts arise out of financial policy and should not be taken into cost accounting altogether.

These expenses should be charged off directly in the Costing Profit and Loss Account. In case when bad debts are included in costing and are considered as part of selling overheads this should be divided into normal and abnormal elements. When bad debts are within normal limits they should be absorbed in selling overheads as normal charge and when they are beyond the normal limits they should be charged off to P/L A/c thereby not being considered in the cost.

9. Canteen Subsidy

Canteen Subsidy is generally treated as an overhead cost. Canteen expenses are booked in a separate standing order number and all receipts from the workers are credited to the same. The net cost representing the canteen subsidy met by the organization is then apportioned to the cost/profit/service centers in any of the following basis

(I) Total wage cost
(ii) Total number of employees employed.
(iii) Total number of employees served.
(iv) Total number of meals served.

10. Data Processing Cost

Data processing is a service activity and the related cost should be allocated to various departments who use the services of the Data processing department. The most accurate basis of allocation of this cost should be number of cards punched or tapes processed relating to various user-departments.

In large organizations this basis may prove to be impractical.
The alternative methods which may be used are:

(a) Number of reports processed pointed,
(b) standard percentage,
(c) computer hours,
(d) man-hours in Data processing deprt.

11. Directors' fees and Salaries.

Directors' Fees, etc. represent Administrative Overheads. Directors' remuneration is sharable between works, administration, selling and distribution when they look after different functions on the basis of time devoted to each function. When there is separate directors to look after such functions viz. Sales, Finance, personnel, Production, etc., their fees and salaries should be grouped under such functional costs and thereafter apportioned to cost units as overhead costs.

12. Dismantling and re-installation of Machinery in the Same Shop :

It may be found over a time span that the original layout is ineffective with the changes in time, outlook troth in business, technological development etc. necessitating readjustment of location and of resting of Machineries. In such a situation, such cost may be written off to P & L A/c.

13. Excavation Expenses for an abandoned project.

This is an unusual expenditure and therefore should be kept outside the purview of costs accounts and charged directly to Profit and Loss Account. If the amount involved is considered to be unreasonably burdensome during an accounting period, then the same may be spread over an appropriate number of years but the period should not be too long.

14. Goods Returned by Customers on Rejection

If the goods returned by customers are resalable in alternative markets, only the cost of outward freight and the expenses incurred on getting the goods back from the original customer will be treated as selling overheads. If the goods are rejected on quality grounds and there is no chance of their being sold an management has to scrap the product, then the cost of production less the net realizable value of the scrap, if any, will have to be treated as factory overheads.

Similarly, if the goods have deteriorated in quality while in storage at sales depots and have been ultimately rejected by the Customer, the cost of sales less net realizable value of scrap, if any, may be treated as selling overheads.

The above treatments apply to normal losses. In case of unusual loss caused due to such rejection the same may be transferred to Costing Profit/Loss Account.

15. Historical Costing :

Costing is a technique and process of ascertainment of costs. The technique in costing consists of principles and rules which govern the procedure of ascertaining costs of products or services. The technique is dynamic and changes from time to time and according to circumstances. There are many types of costing of which historical costing is one and widely used. In 'Historical Costing', cost are ascertained after they are incurred. Historical Costing, therefore, means the actual cost and does not consider any standard or estimated cost. This type of costing though presenting the actual cost, is losing importance to the

16. Interest on Capital :

There are divergent views on this item. Some argue for its inclusion in 'cost' and have points in support and others do not regard it as a part of 'cost'.

The argument for inclusion of interest in cost are that interest is a reward for capital and that real profit cannot be ascertained without taking interest into account. In order to make intelligent comparison of cost it is necessary to include notional interest when financing is done out of own capital.
But the argument against inclusion of interest in cost are that the required of capital is profit and not interest. Comparison of costs can be drawn up on a proforma basis without complicating cost accounts by including interest.

17. Rectification Work

The rectification work on finished goods or a job may be carried out at the factory premises before dispatch to customers or at customers' place subsequent to dispatch. The reasons for carrying out such rectification work may be attributable to manufacturing defects, use of sub-standard components, mishandling during transit etc. Minor rectification work can be treated as manufacturing overheads or selling overheads as the case may be. However, cost of major repairs and replacement of exceptional nature should be treated either as a deferred charge or written off to Costing Profit/Loss Account.

18. Sales Promotion Expenses

These expenses are incurred to promote sales promotion which in turn, depends on the business policy of the organization. Unlike manufacturing expenses where nature and amount of the expenses are closely linked with production, sales promotion expenses are linked with the marketing policy of the organization.

Generally sales promotion expenses include advertisements in Souvenir, Posters, Sign-boards, Neon-signs etc. Sales promotion expenses should be treated as deferred revenue expenditure to be charged off as overheads over a period because the benefits arising out of sales promotion policy are expected to accrue over a fairly long period of time, say 7/10 years. The apportionment of such costs on to particular products may be done on incremental sales achieved due to the promotional drive.

If the sales promotion is undertaken for a short period and the amount spent is not large, expenses on such promotion may be written off in the same year under selling and distribution overheads.

Short Questions with multiple choice

1. State the unit of cost for the following industries
- (a) Transport
- (b) Power
- (c) Hotel
- (d) Hospital

2. State the method of costing that would be most suitable for
- (a) Oil refinery
- (b) Bicycle manufacturing
- (c) Interior decoration
- (d) Airlines company

3. The set up cost of a machine is Rs. 120. A certain order requires 9,000 components to be made in the machine for execution of the order. Cost of production of the component is Rs. 40 each at its requires 15% of the cost for storing it for a year. Then the Economic Batch quantity is_____ units.

(a) 300; (b) 250
(c) 400; (d) 600

4. The cost per unit of a product manufactured in a factory amounts to Rs. 160 (75% variable) when production is 10,000 units, when production increases by 25% the cot of production will be Rs._____ per unit.

(a) 145 (b) 152
(c) 150 (d) 140

5. The budgeted standard hours of a factory is 12,000. The capacity utilization ratio for April 2007 stood at 90% while the efficiency ratio for the month came to 120%. The actual production in standard hours for April, 2007 was_____.

(a) 10,800 (b) 12,960
(c) 14,400 (d) 12,800

6. In a mill number of employees at the beginning and end of a period where 2,486 and 2,334 respectively. During the period, 320 workers left the mills while 168 persons joined in service. Labour turn over rate as per Flux method will be_____.

(a) 8.22% (b) 9.46%
(b) 10.12% (d) none of the above.

7. A chemical is manufactured by combining two standard items of input A (Standard price Rs. 60/kg.) and B (Rs. 45/kg.) in the ratio 60%: 40%. Ten per cent of input is lost during processing. If during a month 1,200 kg. of the chemical is produced incurring a total cost of Rs. 69,600, the total material cost variance will be_____

(A) Rs. 2,400 (Adv); (B) Rs. 2,400 (Fav); (C) Rs. 3,000 (Adv); (D) Rs. 2,000 (Fav)

8. A factory makes use of a component purchased from the market for assembling its final product, current usage varies between 300 and 450 units per week and replenishment time is normally two weeks but can go up to five weeks. The minimum stock level of the component is_____ units.

(A) 1,500; (B) 1,600; (C) 2,000 (D) 2,400

9. In two consecutive periods, sales and profit were Rs. 1,60,000 and Rs. 8,000 respectively in the first period and Rs. 1,80,000 and Rs. 14,000 respectively during the second period. If there is no change in fixed cost between the two periods then P-V ratio must be_____.

10. A company has margin of safety of Rs. 40 lakhs and earns an annual profit of Rs. 10 lakhs. If the fixed cost amount to Rs. 20 lakhs, annual sales will be_____.

(A) Rs. 160 lakhs; (B) 140 lakhs; (C) Rs. 120 lakhs; (D) Rs. 200 lakhs

11. In a factory of ZB Ltd. operating standard cost system, 2,000 kgs. of a material @ Rs. 12 per kg. were used for a product, resulting in price variance of Rs. 6,000 (FAV) and usage variance of Rs. 3,000 (ADV). Then standard material cost of actual production was

A. Rs. 24,000 B. Rs. 27,000
C. Rs. 30,000 D. Rs. 33,000

12. The standard time required per unit of a product is 20 minutes. In a day of 8 working hours a worker gives an output of 30 units. If he gets a time rate of Rs. 20

A. Rs. 200
B. Rs. 192
C. Rs. 180
D. Rs. 160

13. A manufacturer used 400 units of a component every month and he buys them entirely from an outside supplier @ Rs. 40 per unit. The order placing and receiving cost is Rs. 100 and storage and carrying cost is 15% of the value of stock. To get

A. 300 units
B. 400 units
C. 450 units
D. 500 units

14. A worker has a time rate of Rs. 15/hr. He makes 720 units of a component (Standard time: 5 minutes/unit) in a week of 48 hours. His total wages including Rowan bonus for the week is _____.

(A) Rs. 792; (B) Rs. 820; (C) Rs. 840; (D) Rs. 864

15. A television company manufactures several component in batches. The following data relates to one component:

Annual demand: 32,000 units; Set-up cost per batch: Rs. 120. Annual rate of interest: 12%; Cost of production per unit: Rs. 16. The Economic Batch quantity is_____ units.

(A) 2,500; (B) 4,000; (C) 3,000; (D) 2,000

16. A company has annual turnover of Rs. 200 lakhs and an average c/s ratio of 40%. It makes 10% profit on sales before charging depreciation and interest which amount to Rs. 10 lakhs and Rs. 15 lakhs respectively. The annual fixed cost of the company is _____.

(A) Rs. 85 lakhs; (B) Rs. 75 lakhs; (C) Rs. 60 lakhs; (D) Rs. 55 lakhs.

17. Sales for two consecutive months, of a company are Rs. 3,80,000 and Rs. 4,20,000. The company's net profits for these months amounted to Rs. 24,000 and Rs. 40,000 respectively. There is no change in C/S ratio or fixed costs. The C/S ratio of the company is _____.

(A) 1/3; (B) 2/5; (C) ¼; (D) None of these.

18. F Ltd. has the following budget and actual data:

Budget fixed overhead cost	Rs. 1,00,000
Budget production (units)	20,000
Actual fixed overhead cost	Rs. 1,10,000
Actual production (units)	19,500

The fixed overhead volume variance:
a) is Rs. 500 adverse;
b) is Rs. 2,500 adverse;
c) is Rs. 10,000 adverse;
d) is Rs. 17,500 adverse;

19. J Ltd. operates a standard cost accounting system. The following information has been extracted from its standard cost card and budgets:

Budgeted sales volume	5,000 units
Budgeted selling price	Rs. 10 per unit
Standard variable cost	Rs. 5.60 per unit
Standard total cost	Rs. 7.50 per unit

It it used a standard marginal cost accounting system and its actual sales were 4,500 units at a selling price of Rs. 12.00, its sales volume variance would be:

a) Rs. 1,250 A
b) Rs. 2,200 A
c) Rs. 2,250 A
d) Rs. 3,200 A.

20. T plc uses a standard costing system, with its material stock account being maintained at standard costs. The following details have been extracted from the standard cost card in respect of direct materials:

8 kg. @ Rs. 0.80/kg. = Rs. 6.40 per unit

Budgeted production in April was 850 units.

The following details relate to actual materials purchased and issued to production during April when actual production was 870 units:

Materials purchased	8,200 kg. costing Rs. 6,888
Materials issued to production	7,150 kg.

Which of the following correctly states the material price and usage variances to be reported?

	Price (Rs.)	Usage (Rs.)
A	286 A	152 A
B	286 A	280 A
C	286 A	294 A
D	328 A	152 A

21. The following data has been extracted from the budget working papers of BL Ltd.

Production Volume	1,000	2,000
	Rs./unit	Rs. /unit
Direct materials	4.00	4.00
Direct Labour	3.50	3.50
Production overheads: Department 1	6.00	4.20
Production overhead: Department 2	4.00	2.00

The total fixed cost and variable cost per unit is:

	Total fixed cost	Variable cost/unit
	Rs.	Rs.
A	3,600	9.90
B	4,000	11.70
C	7,600	7.50
D	7,600	9.90

22. Z plc uses a standard costing system and has the following labour cost standard in relation to one of its products:

4 hours skilled labour @ Rs. 6.00 per hour = Rs. 24.00

During October 3,350 of these products were made, which was 150 units less than budgeted. The labour cost incurred was Rs. 79,893 and the number of direct labour hours worked was 13,450. The direct variances for the month were:

	Rate (Rs.)	Efficiency (Rs.)
A	804 (F)	300 (A)
B	804 (F)	300 (F)
C	807 (F)	297 (A)
D	807 (F)	300 (A)

23. The standard ingredients of 1 kg. AB are 0.7 kg A (cost Rs. 5 per kg.) and 0.3 kg. B (cost Rs. 8 per kg.). in the current period, 100 kg. AB has been produced using 68 kg. A and 32 kg. B. The material mixture variance is:

a) Rs. 10 (A) b) Rs. 6 (F);
c) Rs. 12 (F); d) Rs. 6 (A).

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24. XYZ plc manufactures its product through a series of processes. The FIFO method of valuing opening work in process is used; the following details relate to September 2009.

Opening WIP was 600 units, each 80% processed as to materials and 60% processed as to conversion costs.

Normal loss was 500 units, fully completed.

Finished output was 14,500 units; there were no abnormal losses or gains.
Closing WIP was 800 units, each 70% processed as to materials and 40% processed as to conversion costs.

When calculating the costs per equivalent unit, the number of equivalent units to be used are:

	Materials	Conversion
A	14,580	14,460
B	14,940	14,580
C	15,180	15,060
D	15,540	15,180

25. P Ltd. is preparing its cash budget for the year ended 31st December 2000. An extract of its sales budget is as follows:

January	Rs. 50,000
February	Rs. 45,000
March	Rs. 60,000
April	Rs. 55,000
May	Rs. 48,000
June	Rs. 60,000

20% of the monthly sales are for cash. The payment pattern of the credit sales is expected to be:

- 50% in the month after sales;
- 25% in the month two months after sales;
- 20% in the month three months after sale.

The remainder is expected to be bad debts. The amount budgeted to be received from customers in May 2000 is:

(a) Rs. 41,200 (b) Rs. 50,800
(c) Rs. 61,100

26. XY Ltd. manufactures two products-the X (which gives a contribution of Rs. 4 per unit) and the Y (which gives a contribution of Rs. 6 per unit). The X and the Y are budgeted to sell in the proportion two units of X for every one unit of Y. XY Ltd. incurs Rs. 14,000 fixed costs per period and its production capacity is 3,000 units of X and 1,500 units of Y. XY Ltd.'s breakeven point is:

(a) 66.66% capacity (b) 55.5% capacity
(c) 822 units of X and 411 units of Y (d) 92.31% of capacity

27. The following data have been extracted from the budget working papers of WR Ltd.

Activity (Machine hours)	Overhead cost Rs.
10,000	13,468
12,000	14,162
16,000	15,549
18,000	16,242

in March 2009, the actual activity was 13,780 machine hours and the actual overhead cost incurred was Rs. 14,521.

The total overhead expenditure variance is nearest to

(A) Rs. 1,750 (F) (B) Rs. 250 (F)
(C) Rs. 250 (A) (D) Rs. 4,520 (A)