

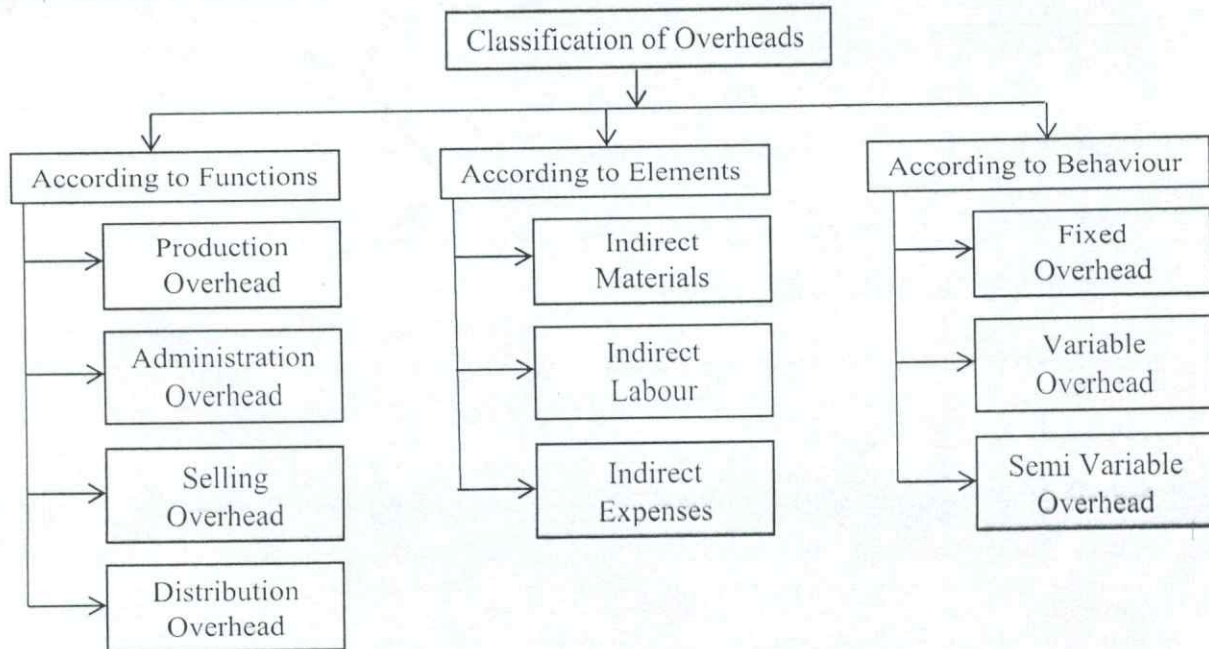
Chapter 4

Overheads

Meaning of overheads: Overhead is the aggregate of indirect materials, indirect wages and indirect expenses. The total of all indirect costs are called as overheads. It is also known as oncost, supplementary costs, non-productive costs, etc.

Definition of overheads: The CIMA of UK has defined overhead as “the aggregate of indirect materials, indirect wages and indirect expenses.”

Classification of overheads



A. According to Functions

1. Production overhead: It is also known as factory overhead, works overhead or manufacturing overhead. It means indirect expenditure incurred in connection with production operations. It is the aggregate of factory indirect material cost, indirect wages and indirect expenses.

Examples: Lubricants, consumable stores, indirect wages (wages of indirect workers), factory power and light, factory rent and rates, depreciation of plant and machinery, depreciation of factory building, insurance of plant and factory building, storekeeping expenses, repairs and maintenance, etc.

2. Administration overhead: It is the indirect expenses which are incurred at the office premises. Examples are General management salaries, audit fees, legal charges, postage and telephone, stationery and printing, office rent and rates, office lighting and salaries of office staff, etc.

3. Selling overhead: These are the costs of seeking to create and stimulate demand or of securing orders. In other words, it refers to those expenses which are associated with the marketing and selling activities. Examples are Advertisement, publicity, market research, salaries and commission of sales personnel, showroom expenses, travelling expenses, bad debts, catalogues and price lists, etc.

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4. Distribution overhead: It comprises of all expenditure incurred from the time product is completed in the factory until it reaches its destination or customer. Examples are Packing costs, carriage outward, delivery van costs, warehousing costs, etc.

Both selling and distribution costs are together called as "After Production Costs"

B. According to Elements

1. Indirect materials: Material costs which cannot be allocated but which are to be apportioned to or absorbed by cost centres or cost units. In other words, it includes the materials which cannot be identified in the production. Examples are Fuel, lubricants, tools for general use, etc.

2. Indirect wages: Indirect wages are those which cannot be allocated but which are to be apportioned to or absorbed by cost centres or cost units. Examples are wages of sweeper and storekeeper, idle time wages, maintenance and repair wages, leave pay, employer's contribution to ESI, etc.

3. Indirect expenses: Expenses which cannot be allocated but which are to be apportioned to or absorbed by cost centres or cost units are indirect expenses. Examples are training expenses, power, depreciation, insurance, taxes, rates and rent, etc.

C. According to Behaviour or Variability

1. Fixed overhead: Overheads which tends to remain unaffected or fixed in total amount by fluctuations in volume of output or output during a period of time is known as fixed overhead. Examples are rent and rates, managerial salaries, building depreciation, postage, stationery, legal expenses, insurance etc.

2. Variable overhead: Overheads which tend to vary in direct proportion to the changes in volume of output is known as variable overhead. There is a linear relationship between the variable overheads and output. Examples are salesman's commission, power, light, fuel, etc.

3. Semi-variable overhead: This overhead is partly fixed and partly variable. In other words, costs vary in part with the volume of production and in part they are constant, whatever is the volume of production. Examples are telephone charges, depreciation, repairs and maintenance, etc.

Allocation: Allocation means charging the full amount of overhead cost to a cost centre, e.g., to a department to a process, etc. It has been defined as "the allotment of whole items of cost to cost centres or cost units." Allocation depends on the nature of cost. If a particular item of cost can be easily identified to a particular cost centre, it is allocated. For example, salary of a foreman in a production department can be easily identified and allotted to this department. Similarly, salary of a time-keeper can be easily allotted to time-keeping department. Other examples of items which are allocated are indirect material depreciation of machinery, idle time cost, overtime cost, etc.

Apportionment: Apportionment is "the allotment of proportions of items of cost to cost centres or cost units." Where an item of cost is common to various cost centres, it is allotted to different cost centres proportionately on some equitable basis. For example, rent of factory building is not allocated but apportioned to various departments on some suitable basis, i.e., area occupied by departments concerned. Similarly salary of a general manager cannot be allocated wholly to any one department as he attends in general to all the departments. It should, therefore, be apportioned on some equitable basis.

Production and Service Department

A production department is one that engages in the actual manufacture of the product by changing the shape, form or nature of material or by assembling the parts into finished product. Example of production department are melting shop, weaving department, spinning department, grinding department etc.

A service department is one rendering a service that contributes in an indirect manner to the manufacture of the product but which does not itself change the shape, form or nature of material that is converted into the finished product. Examples are labour welfare department, purchasing department, accounting department, canteen etc.

Allocation and Apportionment

1. Primary Distribution: The distribution of overheads to various departments is known as departmentalization of overheads or primary distribution. This is done by allocation and apportionment of various items of overhead to various departments.

2. Secondary Distribution (Apportionment of service Department Overheads): The distribution of service department expense to the various production departments on some equitable basis or on the basis of percentage of services rendered is called Secondary Overhead Distribution Summary.

PRIMARY DISTRIBUTION

Bases of Apportionment of Overhead: Different items of overhead are apportioned on different basis. Some of the common bases of apportionment of different items of overhead are illustrated in the following table

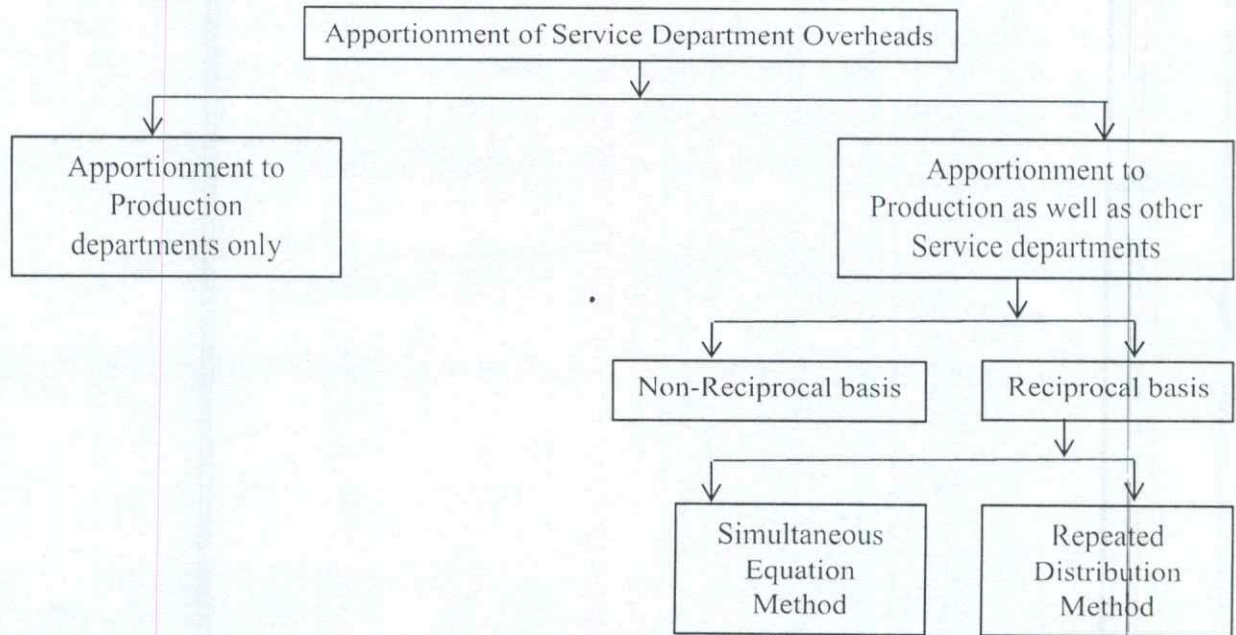
<i>Overhead Cost</i>	<i>Bases of Apportionment</i>
1. (i) Rent and other building expenses (ii) Lighting and heating (iii) Fire precaution service (iv) Air condition	Floor area, or Volume of department
2. (i) Fringe benefits (ii) Labour welfare expenses (iii) Time-keeping (iv) Personnel office (v) Supervision	Number of workers
3. (i) Compensation to workers (ii) Holiday pay (iii) ESI and PF contribution (iv) Fringe benefits	Direct wages
4. General overhead	Direct labour hours, or Direct wages, or Machine hours
5. (i) Depreciation of plant and machinery (ii) Repairs and maintenance of plant and machinery (iii) Insurance of stock	Capital values
6. (i) Power/steam consumption (ii) Internal transport (iii) Managerial salaries	Technical estimates
7. Lighting expenses	No. of light points, or Area
8. Electric power	Horse power of machines, or Number of machine hours, or Value of machines
9. (i) Material handling (ii) Stores overhead	Weight of materials, or Volume of materials, or Value of materials

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SECONDARY DISTRIBUTION

Apportionment of service department costs: Once the overheads have been allocated and apportioned to production and service departments and totalled, the next step is to re-apportion the service department costs to production departments. This is necessary because our ultimate object is to charge overheads to cost units, and no cost units pass through service departments. Therefore, the costs of service departments must be charged to production departments.

There are various methods of apportionment of service department overheads. These methods are shown in the following chart



1. Apportionment to Production department only: Here the total amount of each service department is distributed to only production department. Some of the important bases of apportionment of service department overheads are given below

<i>Service Department</i>	<i>Basis of Apportionment</i>
1. Purchase Department	(a) Value of materials purchased (b) No. of orders placed
2. Time office Personnel Department	(a) No. of employees (b) Wages paid (c) Labour hours
3. Canteen Labour Welfare	(a) No. of employees (b) Wages paid
4. Accounts Office	(a) No. of employees (b) No. of time cards handled
5. Laboratory	(a) Testing laboratory hours (b) Units of output
6. Maintenance Department	No. of hours worked in each department.

2. Apportionment to Production as well as Service departments: Quite often, a service department renders service not only to production department but also to other service departments. For example, maintenance department looks after not only the plant and machinery of production department but

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also the equipment of other service departments like power-house, material handling, etc. Similarly power-house supplies electricity not only to production departments but also to other service departments like canteen, maintenance department, etc. This type of inter-service department apportionment may be either on reciprocal basis or non-reciprocal basis.

a. Non-reciprocal Distribution (Step Ladder Method): This is done when various service departments are not interdependent. This means a service department provides its services to other service departments but does not receive any service from that service department. In such a case if there are two service departments, the cost of service department which renders service to other service department should be apportioned first. Then the cost of the other service department will comprise of its own cost plus share allotted to it from the other service department. For example, there are two service departments X and Y. X department provides its services to Y and other production departments. On the other hand, Y does not provide its service to X department but only to production department.

More Than Two Service Departments: When there are more than two service departments and distribution is to be done on non-reciprocal basis, the service departments should be arranged in the descending order of their serviceability.

- The cost of the most serviceable department i.e. the department which serves the largest number of department is apportioned first.
- The service department which serves the next largest number of departments is then taken up for apportionment of its cost (including the pro-rated cost of the first service department).
- In this way the cost of the third serviceable department is taken up and this process continues till the cost of the last service department is apportioned. It should be noted that the cost of the last service department is apportioned only to production departments.

b. Reciprocal Distribution: This method is followed when service departments are mutually dependent. For example, there are two service departments A and B. Department A renders service to all the production departments and also to service department B. Similarly, service department B provides service to other service department A and also to production departments. Thus both A and B depend upon each other for their services. There are two main methods which are used for such reciprocal distribution.

i. **Simultaneous Equation Method:** In this method the algebraic equations given below help in the apportionment of overheads.

$$X = a + bY$$

$$Y = a + bX$$

ii. **Repeated Distribution Method:** This method consists of closing and reopening the departmental service account by successive distribution.

Process of Repeated Distribution: The following steps are involved in this method

1. Apply the given percentages to distribute the primary total of the first service department. By charging the amount to other departments, the account of the first service department is closed.
2. Apply the given percentages to the second service department whose total is made up of its

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4. Repeat this process of distribution again starting with service department No. 1 whose total now consists only of amounts apportioned from other service departments. In this way service department totals keep on reducing with each process of distribution because each time a substantial amount is charged to the production departments.
5. This process is stopped at the point where it is felt that the remaining figures are too small to be of any consequence.

Machine Hour Rate

Meaning of Machine Hour Rate: Machine hour rate means the cost of running a machine for one hour. This method is applicable where work is performed mainly on machines. A separate rate is usually computed for each machine or a group of similar machines. This rate is obtained by dividing the amount of factory overheads chargeable to a machine by the number of machine hours. Overhead charge to a job is made on the basis of number of machine hours worked on that job.

Machine Hour Rate = Factory Overhead for Machine / Number of Machine Hours

Computation of Machine Hour Rate: The following steps are taken for the computation of machine hour rate:

1. The factory overheads are first apportioned to departments.
2. Overheads of the department are further apportioned to different machines or group of machines. For this purpose each machine or a group of machines is treated as a cost centre or a small department.
3. Specific overheads like power, depreciation, etc., should be directly allocated to the machine.
4. The overheads relating to the machine should be divided between (a) Fixed or standard charges; and (b) Variable charges. Fixed charges are those which remain constant irrespective of the use of the machine, e.g., rent, supervisor's salary, etc., and variable charges are those which vary with the use of machines, e.g., power, depreciation, etc.
5. The working hours of the machine are estimated for the period.
6. Overheads pertaining to the machine are totalled and divided by the number of machine hours. The resultant figure will be machine hour rate. The time required for setting the machine (unless it is treated as productive time) should be deducted from the total working hours.
7. Comprehensive (or composite) machine hour rate: When the direct wages of machine operators are included in machine hour rate, it is known as comprehensive machine hour rate. Thus in a comprehensive machine hour rate, overhead and direct wages are absorbed by a single rate.

Bases of Apportionment of Different Expenses to Machines

<i>Items of expenses</i>	<i>Basis</i>
1. Rent and rates	Ratio of floor area occupied by each machine
2. Insurance	Insured value of each machine
3. Supervision	Estimated time devoted by the supervisor to each machine
4. Lighting	No. of light points used for the machines, or floor area occupied by each machine
5. Depreciation	Capital values / Machine hours or both
6. Repairs and maintenance	Capital values / Machine hours
7. Lubricating oil and other consumable stores	Capital values / Machine hours

Advantages of Machine Hour Rate Method

1. It is a scientific and accurate method of absorption of factory overheads.
2. It gives due consideration to time factor and thus produces more equitable results.
3. This is an ideal method where production is carried out on machines.
4. When separate rates are calculated for fixed and variable overheads, the cost of idle machines can be measured without difficulty.

Disadvantages

1. This method can be used only in those departments where work is done by machines.
2. It is quite difficult to estimate total machine hours in advance.
3. This method requires the maintenance of detailed records about machine time taken by various jobs.
4. This increases the clerical cost.

Assignment Questions

Section A

1. What is overhead?
2. Define overhead.
3. What is fixed overhead? Give example. (Any type of overhead can be asked)
4. What is the difference between prime cost and overhead; works on cost and works cost?
5. Give 5 examples of factory overhead.
6. What is the departmentalization of overhead?
7. What machine hour rate?
8. What is apportionment and allocation?
9. How do you apportion the following expenses among various departments
a. Depreciation b. Rent c. Repairs d. Supervision

Section B

1. Explain the different methods of classification of cost.