

Chapter : Accounting for Overheads

THEORY

1. Introduction — Why do we study overheads?

When a product is manufactured, three types of expenses are always incurred : **(1) direct material, (2) direct labour and (3) other expenses**. The first two can be identified with the product directly. But there are many other expenses — like rent of the factory building, electricity, salaries of supervisors, repairs, insurance, depreciation, office rent, telephone, advertising — which cannot be traced to any one unit of the product. These common expenses are together called **Overheads**. If these expenses are not properly collected, divided and charged to products, the true cost of each product can never be known.

Therefore cost accounting gives special attention to the **collection, classification, apportionment and absorption of overheads**. This whole process is called '**Accounting for Overheads**'.

2. Meaning of Overheads

Overheads are the total of all **indirect costs** of an organisation. In simple words :

$$\text{Overheads} = \text{Indirect Material} + \text{Indirect Labour} + \text{Indirect Expenses}$$

These expenses are incurred for the benefit of the whole business and not for any single product, job or process. Hence they cannot be charged directly; they must be shared by all products on some fair basis.

Overheads are also known by other names such as '**on-cost**', '**burden**', '**supplementary cost**' or '**indirect cost**'.

3. Definition of Overheads

"Overheads are the aggregate of indirect material cost, indirect wages and indirect expenses which cannot be conveniently identified with and charged directly to a specific cost unit or cost centre."

Points to note from this definition : (1) they are indirect in nature; (2) they are common to many cost units or cost centres; (3) they can only be apportioned or absorbed, not directly charged; (4) they include indirect material, indirect labour and indirect expenses.

4. Direct Costs and Indirect (Overhead) Costs — Comparison

Before studying overheads we must clearly understand the difference between direct and indirect items. Direct items form part of **prime cost**, while indirect items form **overheads**.

Item	Direct cost	Indirect cost (Overhead)
Meaning	Cost which can be identified with and charged directly to a particular product/job	Cost which is common and cannot be charged to any single product/job

Traceability	Easily traceable to output	Not traceable to output directly
Examples	Raw material, wages of workers making the product, hire of special machine	Factory rent, power, supervisor salary, stationery, advertising
Treatment	Part of prime cost	Added above prime cost (as overheads)
Control	Controlled through standards of usage	Controlled through budgets and apportionment

5. Features / Characteristics of Overheads

- Overheads are always indirect — they arise from indirect materials, indirect labour and indirect expenses.
- They cannot be allocated to any single product, job or cost unit.
- They are shared by more than one cost centre or product.
- They include both fixed costs (rent, salary) and variable costs (power, indirect material).
- They form a major part of total cost — often 25% to 60% of total cost.
- They need special methods (apportionment and absorption) to reach the product.

6. Importance / Need of Accounting for Overheads

Proper accounting of overheads is essential because :

- It helps to find the true total cost and per-unit cost of products.
- It helps in fixing the selling price of products and quoting tenders.
- It helps in valuing closing stock of finished goods at correct cost.
- It helps management to control wasteful expenses.
- It makes comparison of costs between different periods and departments possible.
- It helps in taking decisions such as make or buy, accept or reject an order.
- It ensures that every product bears its fair share of common expenses.

7. Classification of Overheads

Overheads are classified mainly under four heads : (A) By element, (B) By function, (C) By behaviour and (D) By controllability.

7.1 Classification by Element (Nature)

- **Indirect Material** : material which is used for production but cannot be identified with a particular product. **Examples** : lubricating oil and grease, cotton waste, coal and fuel, small tools, nails, stationery, cleaning material, consumable stores.
- **Indirect Labour** : wages paid to workers who do not directly work on the product but help production. **Examples** : wages of storekeeper, supervisor, foreman, time-keeper, watchman, sweeper, inspection staff, wages for idle time.

- **Indirect Expenses** : expenses other than material and labour which are of indirect nature. **Examples** : rent, rates and taxes, power and lighting, insurance premium, depreciation, repairs and maintenance, telephone, postage, advertisement, selling expenses.

7.2 Classification by Function (most important)

According to the function for which the expense is incurred, overheads are of four types :

- **Factory (Works / Manufacturing / Production) Overheads** : all indirect expenses incurred inside the factory from the stage of receipt of material till the production is completed. **Examples** : factory rent and rates, factory lighting and power, fuel, indirect material and indirect labour of factory, factory supervisor's and works manager's salary, depreciation of plant and machinery, repairs and maintenance of machines, insurance of factory and plant, workers' welfare and canteen expenses, drawing office expenses, factory telephone.
- **Office and Administration Overheads** : all expenses incurred for the general administration and management of the office. **Examples** : office rent, rates, lighting and heating; salaries of office staff and general manager; postage, telegrams and telephone; printing and stationery; audit fees; legal charges; depreciation of office furniture; bank charges; director's fees.
- **Selling Overheads** : expenses incurred to create demand and to sell the product — i.e. to persuade customers to buy. **Examples** : salary and commission of salesmen and sales manager, advertisement, free samples, showroom rent, travelling expenses of sales staff, sales office expenses, market research.
- **Distribution Overheads** : expenses incurred to deliver the product from the factory to the customer. **Examples** : packing charges, carriage (freight) outward, godown (warehouse) rent, delivery van expenses, insurance of goods in transit, loading and unloading charges.

Note : selling expenses are connected with getting orders while distribution expenses are connected with fulfilling orders (delivery).

7.3 Classification by Behaviour (Variability)

- **Fixed Overheads** : expenses which remain constant in total whatever may be the output, within a given capacity. **Examples** : rent, salary of permanent staff, insurance premium, depreciation on time basis, legal expenses. **Behaviour** : total remains same but per unit falls as production increases.
- **Variable Overheads** : expenses which change in direct proportion to the change in output. **Examples** : direct material, direct labour (piece rate), power per unit, packing material, consumable stores. **Behaviour** : total changes proportionately but per unit remains nearly constant.
- **Semi-variable (Semi-fixed) Overheads** : expenses which are partly fixed and partly variable. They do not change in the same proportion as output. **Examples** : telephone bill (fixed rent + call charges), electricity bill (fixed + per-unit charge), repairs and maintenance, depreciation under machine hour method, supervisor's salary with overtime.

Separation of semi-variable cost (High-Low Method) : Take the highest and the lowest levels of activity.

Variable cost per unit = $(\text{Cost at highest activity} - \text{Cost at lowest activity}) \div (\text{Highest units} - \text{Lowest units})$.

Then Fixed cost = Total cost at any level – (Variable cost per unit × units at that level).

Example : At 1,000 units cost is Rs 50,000 and at 1,500 units cost is Rs 60,000. Variable cost per unit = $(60,000 - 50,000) \div (1,500 - 1,000) = \text{Rs } 20$. Fixed cost = $50,000 - (1,000 \times 20) = \text{Rs } 30,000$.

7.4 Classification by Controllability

- **Controllable Overheads :** overheads which can be controlled by the departmental manager, e.g. indirect material, power, repairs, consumable stores.
- **Uncontrollable Overheads :** overheads which are beyond the control of the manager at a given level, e.g. rent, rates, depreciation, salary of top management.

Other classifications : by normality (normal & abnormal overheads) and by capital/revenue nature.

Normal overheads are expected and are part of cost; abnormal overheads (e.g. loss by fire, strike) are not part of cost and are charged to costing profit & loss account.

8. Cost Unit and Cost Centre

- **Cost Unit :** the unit of product or service in which cost is expressed, e.g. per tonne of cement, per kg of paper, per metre of cloth, per litre of milk, per passenger-km.
- **Cost Centre :** the smallest segment, department or part of the organisation for which costs are collected separately, e.g. Machine shop, Canteen, Stores, Power house. Cost centres may be *production cost centres* or *service cost centres*.

Overheads are first collected for cost centres, then charged to cost units.

9. Collection of Overheads (Step 1)

Collection means gathering the actual amount of each overhead item from the original records. Main sources of collection are :

- **Invoices :** for purchases of stores, power, rent, repairs etc.
- **Stores requisition notes / Material abstract :** for indirect material issued from stores.
- **Wages analysis sheet :** for indirect labour and idle time wages.
- **Job cards, time cards and payroll records**
- **Cash book and journal entries for indirect expenses**

All collected items are then coded under proper standing order numbers (standing orders are codes given to each overhead item, e.g. Rent = 101, Power = 105) so that similar items are grouped together.

10. Classification and Codification (Step 2)

After collection, the overhead items are grouped under the headings already discussed (element-wise, function-wise). To make this grouping easy and accurate, each item is given a code number called '**Standing Order Number**' (for factory overheads) and '**Cost Account Number**' (for office, selling and distribution overheads).

11. Allocation of Overheads (Step 3A)

Allocation means charging the full amount of an overhead item directly to that department or cost centre for which it was incurred. **Example** : the salary of the works manager of Department A is fully charged to Department A.

Principles of allocation : (1) allocate only that item which clearly belongs to one department; (2) allocation is made on actual basis; (3) both production and service departments get their own direct overheads allocated first.

12. Apportionment of Overheads (Step 3B)

Apportionment means dividing a common overhead item among two or more departments on a fair and equitable basis. **Example** : factory rent is divided among departments on the basis of floor area occupied by each.

Why apportionment is needed : many expenses (rent, power, lighting, general manager's salary) are incurred for the benefit of all departments together. They must therefore be divided among all departments.

Principles of apportionment : (1) the basis must be fair and logical; (2) the same basis should be used consistently; (3) service department and production department overheads are both apportioned first from the total collected overheads.

13. Basis of Apportionment — Complete Table

The following table shows which basis is used for which overhead item. This is a very common examination question :

Overhead item	Suitable basis
Rent, rates, taxes, insurance of building	Floor area occupied (sq. metres)
Lighting (electricity for light), heating	Number of light points / meters / floor area
Power (electric power), fuel	Kilo-watt hours (KWH) / horse-power hours / machine hours
Depreciation of machines	Capital value (cost) of machines
Insurance of plant & machinery	Capital value of plant & machinery
Repairs and maintenance	Machine hours / value of machines
Indirect wages, supervision (foreman salary)	Direct labour hours / number of workers
Canteen, workers' welfare, ESI, PF (employer share)	Number of employees / workers
Stores (godown) expenses	Value or quantity of material issued / number of requisitions
Purchase department expenses	Value of purchases / number of purchase orders
Fire insurance of stock	Value of stock
Depreciation of vehicles / delivery expenses	Mileage / time
General / miscellaneous overheads	Direct labour hours / direct wages / any fair base

Remember the trick : choose a basis that has the closest cause-and-effect relation with the expense.
Example — rent depends on space, power depends on machines' consumption, supervision depends on number of men.

14. Difference between Allocation and Apportionment

Point	Allocation	Apportionment
Meaning	Whole expense is charged to the department which incurred it	Common expense is divided among two or more departments
Nature	Direct charging, no division	Equitable sharing on a basis
When used	Expense clearly belongs to one department	Expense is common to several departments
Accuracy	More accurate (actual)	Based on estimates / fair basis
Example	Salary of Dept-A foreman to Dept-A	Rent divided by floor area among A, B, C

15. Primary and Secondary Distribution

- **Primary Distribution** : the first distribution — charging/apportioning all overheads (both of production and service departments) to the different departments. After this, every department's total overheads are known.
- **Secondary Distribution (Re-apportionment)** : the second distribution — transferring the total overheads of service departments to the production departments.

16. Re-apportionment of Service Department Overheads (Step 4)

Service departments (e.g. stores, canteen, repair shop, power house, time office) do not produce saleable goods. Their costs are therefore transferred to the production departments which actually produce goods. Methods used :

16.1 Direct / Non-reciprocal Distribution Method

Service department cost is distributed directly among **production departments only**. Services given by one service department to another are ignored. It is simple but not accurate when service departments serve each other.

16.2 Step / Sequential / Eliminating Method

Service departments are taken one by one in a sequence. The first service department's total cost is distributed to **all other departments** (production + remaining service departments). Then the second service department's increased total is distributed, and so on. The last service department is distributed only to production departments. Order chosen is usually by the amount of service given or by the size of its cost.

16.3 Reciprocal Service Methods

When service departments give service to each other, full effect is taken. Three methods :

- **Repeated Distribution Method** : service department costs are distributed again and again (in repeated rounds) among all other departments including service departments, until the amounts become very small (negligible). The tiny balance is finally transferred to production departments.
- **Simultaneous Equation Method** : write total cost of each service department after receiving from the other in the form of simultaneous equations, solve them, and then distribute the solved figures to production departments. Used when only two service departments serve each other.

- **Trial and Error Method** : the service department giving highest service is taken first; its cost is apportioned among itself and others repeatedly till amounts become small. Suitable when more than two service departments are involved.

16.4 Worked Example — Simultaneous Equation Method

Two service departments X and Y. Overheads after primary distribution : Production A = Rs 40,000; B = Rs 30,000; X = Rs 8,000; Y = Rs 5,000. X's cost is apportioned 40% to A, 30% to B, 30% to Y. Y's cost is apportioned 50% to A, 30% to B, 20% to X.

Solution : Let total cost of X = x and total cost of Y = y.

$$x = 8,000 + 20\% \text{ of } y \rightarrow x = 8,000 + 0.20y$$

$$y = 5,000 + 30\% \text{ of } x \rightarrow y = 5,000 + 0.30x$$

$$\text{Solving : } x = 8,000 + 0.20(5,000 + 0.30x) = 8,000 + 1,000 + 0.06x \rightarrow 0.94x = 9,000 \rightarrow x = \text{Rs } 9,574$$

$$y = 5,000 + 0.30 \times 9,574 = \text{Rs } 7,872$$

Now distribute : X's solved cost 9,574 → A 40% = 3,830; B 30% = 2,872; (Y already received 30%). Y's solved cost 7,872 → A 50% = 3,936; B 30% = 2,362; (X already received 20%).

Final total — Dept A = 40,000 + 3,830 + 3,936 = Rs 47,766; Dept B = 30,000 + 2,872 + 2,362 = Rs 35,234.

17. Absorption of Overheads (Step 5)

After re-apportionment, the total overheads of each production department are known. Absorption means charging these overheads to the **cost units (products)** passing through that department. It is done with the help of a suitable overhead rate.

Methods of absorption : the rate is selected according to the nature of the product and the department. The main methods are :

Method	Formula / Basis	Suitable when
1. Percentage of direct material cost	$(\text{Dept. overhead} \div \text{Direct material cost}) \times 100$	Material forms a large part and is uniform
2. Percentage of direct wages (labour cost)	$(\text{Dept. overhead} \div \text{Direct wages}) \times 100$	Labour cost is a fair indicator of effort
3. Percentage of prime cost	$(\text{Dept. overhead} \div \text{Prime cost}) \times 100$	Both material & labour are equally important
4. Direct labour (worker) hour rate	$\text{Dept. overhead} \div \text{Total direct labour hours}$	Work is done mainly by manual labour
5. Machine hour rate	$\text{Dept. overhead} \div \text{Total machine hours}$	Work is done mainly by machines
6. Rate per unit	$\text{Dept. overhead} \div \text{Number of units produced}$	Only one type of uniform product is made

Note : The first three methods are called 'percentage methods'. They are simple but not accurate because they ignore the time factor.

18. Direct Labour (Worker) Hour Rate

This rate is used when production is carried out mainly by manual labour. The total overheads of the department are divided by the total number of direct labour hours worked.

$$\text{Direct labour hour rate} = \text{Departmental overheads} \div \text{Total direct labour hours}$$

Example : Department overheads = Rs 48,000; direct labour hours worked = 12,000 hours.

$$\text{Rate} = 48,000 \div 12,000 = \text{Rs 4 per direct labour hour}$$

Advantages : time factor is considered; idle time automatically excluded; fair for labour-intensive work.

Limitations : requires recording of time spent by each worker on each job (more clerical work); not suitable for machine-based production.

19. Machine Hour Rate

Machine hour rate means the cost of running a machine for one hour. It is used where production is mainly done by machines.

$$\text{Machine hour rate} = \frac{\text{Total overheads of the machine (or machine cost centre)}}{\text{Total working hours of the machine}}$$

Expenses included in machine hour rate : the total cost relating to the machine is divided into two groups :

- **Standing (fixed) charges :** rent of factory (share), lighting, supervisor's salary, insurance — these relate to time and do not depend on running of machine. They may be charged on the basis of hours for which the factory works.
- **Machine (running / variable) expenses :** power, repairs and maintenance, depreciation, consumable stores — these directly relate to the running of the machine.

19.1 Steps to calculate Machine Hour Rate

Step 1 : Allocate factory overheads to the production department concerned.

Step 2 : Further allocate departmental overheads to each machine (or take all similar machines together as a machine cost centre).

Step 3 : Divide expenses into standing (fixed) and running (variable) charges.

Step 4 : Estimate the working hours of the machine (total hours the machine is expected to work).

Step 5 : Add standing and running charges for the machine for the period and divide by total working hours to get the rate per machine hour.

19.2 Worked Example of Machine Hour Rate

A machine costs Rs 2,00,000. Estimated working hours for the year = 4,000. Other expenses : power Rs 8,000; repairs Rs 4,000; depreciation 10% of cost; rent of factory (machine's share) Rs 5,000; lighting Rs 1,000; supervisor's salary (share) Rs 6,000. Compute machine hour rate.

Solution : Depreciation = $10\% \times 2,00,000 = \text{Rs } 20,000$.

Expense	Amount (Rs)
Standing charges : Rent 5,000 + Lighting 1,000 + Supervisor 6,000	12,000

Running charges : Power 8,000 + Repairs 4,000 + Depreciation 20,000	32,000
Total charges for the year	44,000

Machine hour rate = Rs 44,000 ÷ 4,000 hours = Rs 11 per machine hour

Advantages of machine hour rate : (1) accurate recovery of overheads; (2) idle machine cost can be found; (3) suitable for machine-based production; (4) helps in comparing cost of different machines.

Limitations : (1) not useful where work is done by hand; (2) wrong estimate of machine hours misleads; (3) heavy clerical work for recording hours.

20. Machine Hour Rate vs Labour Hour Rate

Point	Machine Hour Rate	Labour Hour Rate
Basis	Hours for which machines run	Hours for which workers work
Formula	Overheads ÷ machine hours	Overheads ÷ direct labour hours
Suitable	Machine-based (mechanised) production	Labour-based production
Accuracy	More accurate for automated units	Satisfactory for manual work
Idle time	Cost of idle machine is shown	Cost of idle workers is not specially shown

21. Under-Absorption and Over-Absorption

Absorption is done on the basis of estimated (budgeted) overheads and estimated hours/output. But actual overheads may differ. Therefore :

- **Under-absorption (absorbed amount < actual) :** when the overheads absorbed in cost are less than the actual overheads incurred. The difference is written as a debit balance — cost of product is shown less than actual.
- **Over-absorption (absorbed amount > actual) :** when the overheads absorbed are more than the actual overheads incurred. The product cost is shown more than actual.

21.1 Causes of Under / Over Absorption

- Wrong estimate (forecast) of overheads for the year.
- Wrong estimate of output or of working hours / machine hours.
- Seasonal changes in production (some months heavy, some light).
- Sudden change in prices of expenses (rates of wages, power, etc.).
- Idle time and machine breakdowns, strikes, lock-outs.
- Abnormal waste, loss or sudden rise in production.

21.2 Accounting Treatment of Under / Over Absorption

- **Write off to Costing Profit & Loss Account :** the difference is transferred to costing P&L A/c. This is the usual method when difference is small or due to abnormal reasons.

- **Adjust with a Supplementary Rate** : the difference is adjusted in the cost of production (WIP, finished stock and cost of sales) by a supplementary overhead rate. Used when the difference is large and due to normal reasons.
- **Carry forward to the next year** : when production is seasonal and the current period is not the whole year.

21.3 Simple Illustration

Budgeted overheads = Rs 1,00,000; budgeted hours = 20,000. Actual overheads = Rs 1,08,000; actual hours = 19,000. **Absorption rate = $1,00,000 \div 20,000 = \text{Rs } 5 \text{ per hour}$** . Overheads absorbed = $19,000 \times 5 = \text{Rs } 95,000$. Actual overheads = Rs 1,08,000. Hence **under-absorption = Rs 13,000**. This amount is written off to costing P&L A/c (or adjusted by supplementary rate = $13,000 \div 19,000 = \text{Rs } 0.68 \text{ per hour}$).

22. Comprehensive Illustration (Primary + Secondary Distribution + Absorption Rate)

A company has three production departments A, B, C and two service departments X and Y. The following are the overheads and apportionment data :

Particulars	Rs	Basis
Factory rent	30,000	Floor area
Power	12,000	Machine hours / KWH
Depreciation	20,000	Capital value of machines
Supervision	18,000	Number of workers
Canteen & welfare	6,000	Number of workers
Lighting	4,000	Light points

Item	A	B	C	X	Y
Floor area (sq.m)	2,000	1,500	2,500	500	500
Machine hours	4,000	3,000	2,000	—	—
Capital value (Rs)	80,000	60,000	40,000	—	—
No. of workers	200	150	100	30	20
Light points	20	16	10	2	2
Direct wages (Rs)	60,000	40,000	30,000	—	—

Step 1 — Primary distribution : Apportion each total on its basis.

Floor area total = $2,000 + 1,500 + 2,500 + 500 + 500 = 7,000$. Rent 30,000 $\rightarrow$ per sq.m = $30,000 / 7,000$. A = $30,000 \times 2,000 / 7,000 = 8,571$; B = 6,429; C = 10,714; X = Y = 2,143 each. Similarly compute other items. (Full working done on the same pattern.)

Step 2 — Secondary distribution : Distribute X's and Y's totals to A, B, C on a fair basis (say X on direct wages and Y on machine hours or as instructed in the question).

Step 3 — Absorption rate : Finally, if machine hours are given : Machine hour rate of Dept A = Total overheads of A $\div$ machine hours of A; and so on.

(In examination problems, follow exactly the basis given in the question and show each distribution in a columnar statement — the overhead distribution summary table.)

23. Exam Tips & Important Points

- Always prepare the overhead distribution summary table with columns for total, A, B, C, X, Y etc.
- In primary distribution, service department overheads are also included; they are removed only in secondary distribution.
- If only production departments receive the service, use the direct method; if service departments serve each other, use step or reciprocal method as instructed.
- Machine hour rate questions often give 'standing charges' and 'running charges' separately — find the total per hour properly.
- While computing depreciation for machine hour rate, treat it as a running charge (on the basis of hours/machine), while rent/insurance/supervision are standing charges.
- Under/over-absorption = Actual overheads – Absorbed overheads.
- Know by heart the basis of apportionment table — it is the most frequently asked theory question.

24. Formula Summary

Overheads = Indirect material + Indirect labour + Indirect expenses

Primary distribution → Total overheads of each department (production + service)

Secondary distribution → Service dept overheads transferred to production depts

Machine hour rate = Total machine-related overheads ÷ Machine hours

Labour hour rate = Departmental overheads ÷ Direct labour hours

% of material = (Overheads ÷ Direct material) × 100 ; % of wages = (Overheads ÷ Direct wages) × 100 ; % of prime cost = (Overheads ÷ Prime cost) × 100

Under/Over absorption = Actual overheads – Absorbed overheads