

CHAPTER 4 OVERHEADS

Question 1

Explain briefly the conditions when supplementary rates are used.

(May 2007, 2 Marks)

Answer

When the amount of under absorbed and over absorbed overhead is significant or large, because of differences due to wrong estimation, then the cost of product needs to be adjusted by using supplementary rates (under and over absorption/actual overhead) to avoid misleading impression.

Question 2

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 informations are as follows:

	<i>Product X</i>	<i>Product Y</i>
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

	<i>Indirect Wages</i>	<i>Consumable Supplies</i>
	(Rs.)	(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 Service	5,340	4,200
General Service	7,520	3,200

	Rs.
– Depreciation on Machinery	39,600
– Insurance of Machinery	7,200

- Insurance of 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 production departments are in the same proportion as shown above for the Consumable supplies.

The following data are also available:

Department	Book value Machinery (Rs.)	Area (Sq. ft.)	Effective H.P. hours %	Production Direct Labour hour	Capacity Machine hour
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.

(May 2007, 6 + 4 + 3 + 2 = 15 Marks)

Answer**(i) Summary of Apportionment of Overheads**

(Rs.)

Items	Basis of Apportionment	Total Amount	Production Deptt.			Service Deptt.		
			M ₁	M ₂	A ₁	Store Service	Engineering Service	General Service
Indirect wages	Allocation given	1,25,140	46,520	41,340	16,220	8,200	5,340	7,520
Consumable stores	Allocation given	45,200	12,600	18,200	4,200	2,800	4,200	3,200
Depreciation	Capital value of machine	39,600	15,840	11,880	3,960	1,584	4,752	1,584
Insurance of Machine	Capital value of machine	7,200	2,880	2,160	720	288	864	288
Insurance on Building	$\frac{1}{3}$ to MI Balance area basis	3,240	1,080	648	864	216	270	162
Power	HP Hr%	6,480	3,240	2,268	324	—	648	—
Light	Area	5,400	1,080	1,296	1,728	432	540	324
Rent	Area	12,675	2,535	3,042	4,056	1,014	1,268	760
Rent of general service	Direct 8% of 6,000	480	—	—	—	—	—	480
Total		<u>2,45,415</u>	<u>85,775</u>	<u>80,834</u>	<u>32,072</u>	<u>14,534</u>	<u>17,882</u>	<u>14,318</u>

(ii) Allocation of service departments overheads

Service Deptt.	Basis of Apportionment	Production Deptt.			Service Deptt.		
		M ₁	M ₂	A ₁	Store Service	Engineering Service	General Service
Store	Ratio of consumable value (126 : 182 : 42)	5,232	7,558	1,744	(14,534)	—	—
Engineering	In Machine hours						

service	Ratio of M ₁ and M ₂ (4 : 5)	7,948	9,934	—	—	(17,882)	—
General service	LHR Basis 20 : 15 : 30	4,406	3,304	6,608	—	—	(14,318)
Production Department allocated in (i)		<u>85,775</u>	<u>80,834</u>	<u>32,072</u>			
Total		<u>2,45,415</u>	<u>1,03,361</u>	<u>1,01,630</u>	<u>40,424</u>		

(iii) Overhead Absorption rate

	M ₁	M ₂	A ₁
Total overhead allocated	1,03,361	1,01,630	40,424
Machine hours	40,000	50,000	—
Labour hours	—	—	3,00,000
Rate per MHR	2.584	2.033	
Rate per Direct labour	—	—	.135

(iv) Statement showing overhead absorption for Product X and Y

Machine Deptt.	Absorption Rate	Product X Hours	Rs.	Product Y Hours	Rs.
M ₁	2.584	10	25.84	6	15.50
M ₂	2.033	4	8.13	14	28.46
A ₁	.135	14	<u>.54</u>	18	<u>2.43</u>
			<u>34.51</u>		<u>46.39</u>

Question 3

Explain Blanket overhead rate.

(Nov 2007, 2 Marks)

Answer

Blanket overhead rate refers to the computation of one single overhead rate for the entire factory. This is also known as plantwise or the single overhead rate for the entire factory. It is determined as follows:

$$\text{Blanket overhead rate} = \frac{\text{Overhead cost for the entire factory for the period}}{\text{Base for the period (Labour Hours, Machine Hours)}}$$

It is useful in companies producing the main product in continue process, e.g. chemical plant, glass plant etc.

Question 4

A machine shop cost centre contains three machines of equal capacities. Three operators are employed on each machine, payable Rs. 20 per hour each. The factory works for fortyeight hours in a week which includes 4 hours set up time. The work is jointly done by operators. The operators are paid fully for the fortyeight hours. In additions they are paid a bonus of 10 per cent of productive time. Costs are reported for this company on the basis of thirteen four-weekly period.

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available:

- ◆ *Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is Rs. 52,000.*
- ◆ *Maintenance and repairs per week per machine is Rs. 60.*
- ◆ *Consumable stores per week per machine are Rs. 75.*
- ◆ *Power : 20 units per hour per machine at the rate of 80 paise per unit.*
- ◆ *Apportionment to the cost centre : Rent per annum Rs. 5,400, Heat and Light per annum Rs. 9,720, and foreman's salary per annum Rs. 12,960.*

Required:

- (i) *Calculate the cost of running one machine for a four week period.*
- (ii) *Calculate machine hour rate.*

(Nov 2007,8, Marks)

Answer

Computation of cost of running one machine for a four week period

	Rs.
Standing charges	Per annum
Rent	5,400
Heat and light	9,720
Forman's salary	<u>12,960</u>
	<u>28,080</u>

	Rs.
Total expenses for one machine for four week period = $\frac{28,080 \times 4}{3 \times 13}$	2,880
Wages: Hours per week = 48 and hours for 4 weeks = $48 \times 4 = 192$	
Wages 192×20	3,840
Bonus $(192 - 16) = 176 \times 20 \times .10$	<u>352</u>
(i) Total standing charges	<u>7,072</u>

Machine Expenses:

	Rs.
Depreciation = $\left(52,000 \times 10\% \times \frac{4}{13} \right)$	1,600
Repairs and maintenance = (60×4)	240
Consumable stores (75×4)	300
Power $(192 - 16) = 176 \times 20 \times .80$	<u>2,816</u>
(ii) Total machine expenses	<u>4,956</u>
Total expenses (i) + (ii)	<u>12,028</u>
Machine hour rate = $\frac{12,028}{176} = 68.34.$	

Question 5

Explain the cost accounting treatment of unsuccessful Research and Development cost.

(Nov 2007, 2 Marks)

Answer

Cost of unsuccessful research is treated as factory overhead, provided the expenditure is normal and is provided in the budget. If it is not budgeted, it is written off to the profit and loss account. If the research is extended for long time, some failure cost is spread over to successful research.

Question 6

Discuss the difference between allocation and apportionment of overhead.

(May 2008, 2 Marks)

Answer

The following are the differences between allocation and apportionment.

1. Allocation costs are directly allocated to cost centre. Overhead which cannot be directly allocated are apportioned on some suitable basis.
2. Allocation allots whole amount of cost to cost centre or cost unit where as apportionment allots part of cost to cost centre or cost unit.
3. No basis required for allocation. Apportionment is made on the basis of area, assets value, number of workers etc.

Question 7

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, break-down, 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*

(Nov 2008, 2 Marks)

Answer

- (a) Rated capacity 36.5 tonnes

(Refers to the capacity of a machine
or a plant as indicated by its manufacturer)

- (b) Practical capacity 30 tonnes

[Defined as actually utilised capacity of a plant

$$\text{i.e. } \frac{36.5}{365} \times (365 - 65) \text{ tonnes}]$$

- (c) Normal capacity 25 tonnes

(It is the capacity of a plant utilized based
on sales expectancy)

- (d) Actual capacity 25.2 tonnes

(Refers to the capacity actually achieved)

Question 8

Following information is available for the first and second quarter of the year 2008-09 of ABC Limited:

	Production (in units)	Semi-variable cost (Rs.)
Quarter I	36,000	2,80,000
Quarter II	42,000	3,10,000

You are required to segregate the semi-variable cost and calculate :

(a) Variable cost per unit; and

(b) Total fixed cost.

(May 2009, 2 Marks)

Answer

	Production (Units)	Semi Variable Cost (Rs.)
Quarter I	36,000	2,80,000
Quarter II	<u>42,000</u>	<u>3,10,000</u>
Difference	<u>6,000</u>	<u>30,000</u>

$$\text{Variable Cost per Unit} = \frac{\text{Change in Semi Variable Cost}}{\text{Change in Production}}$$

$$= \frac{\text{Rs. 30,000}}{6,000 \text{ units}}$$

$$= \text{Rs. 5 per units}$$

$$\text{Total Fixed Cost} = \text{Semi Variable Cost} - (\text{Production} \times \text{Variable Cost per Unit})$$

Total fixed cost in Quarter I :

$$= 2,80,000 - (36,000 \times 5)$$

$$= 2,80,000 - 1,80,000$$

$$= 1,00,000$$

Total fixed cost in Quarter II :

$$= 3,10,000 - (42,000 \times 5)$$

$$= 3,10,000 - 2,10,000$$

$$= 1,00,000$$