COST AND MANAGEMENT ACCOUNTING -1
SEMESTER 2
CBCS (H)
OVERHEAD ACCOUNTING
SECTION :2C
TEACHER: Prof Sunita Saha)SS

ACCOUNTING FOR OVERHEAD

SECTION :-2C

The following are some of common bases used for primary distribution overhead in a manufacturing concern

Items of production overhead	**Basis of distribution**
Depreciation of plant and machinery	Capital value of the asset
Repairs to machinery	Same as above
Insurance of plant and machinery	Same as above
Rent, rates and taxes of factory premises	Floor area occupied
Power/motive power	Kilowatt or horse power of machine
Insurance of stock	Average value of stock
Insurance and rent of factory building	Floor area occupied
Canteen expenses , welfare expenses of employees, ESI contribution, payroll expenses, fringe benefit to workers, supervision charges etc	Number of workers or direct wages
Audit fees	Sales
Indirect materials	Direct Materials
Indirect Wages	Direct Wages
Sundry Expenses	Direct wages or working hours

The various bases commonly used for the distribution of service department

Costs of service department	Bases of redistribution
Repairs and maintenance	Hours worked (Asset value * hours worked)
Canteen	Number of workers
Stores	Value or quantity of stores issued
Power house	Heat area or cubic content

Absorption of overhead

After the re distribution of service department costs to the production department the overhead of a production department will consists of:

a) Its own overhead
b) Shares of common overhead
c) Share of overhead of the services departments redistributed to it.

Aggregate of a, b, c above for all the production departments will exactly equal the total factory overhead for the period under consideration. The total overhead of production departments is to be borne by all the costs units relating to the respective production department. This is known as overhead recovery.

Three methods are considered:

a) Production Unit Method
b) Percentage Method
c) Hourly Method
a) Production Unit method:

Actual overhead to be absorbed/ Number of cost unit produced

b) Percentage method:
i) Percentage on direct labor = Actual production overhead/ actual direct material costs*100
ii) Percentage of direct wages = Actual production overhead/ Actual direct wages*100
iii) Percentage on prime costs= Actual production overhead/ Actual prime costs*100
c) Hourly rate method
i) Machine Hour Rate:- Actual production overhead/ Actual machine Hour
ii) Labour hour rate:- actual production overhead/ actual direct labour hours

Under and over absorption of overhead

If overhead absorbed exceeds the actual overhead the excess of absorbed overhead over the actual overhead is called over absorption of overhead as the amount charged to production has not been incurred

On the other hand when actual overhead is more than the overhead absorbed then the excess of actual overhead over absorption overhead is known as under absorption of overhead as this amount remains uncharged to production

Overabsorption takes place:

1. The total overhead incurred is less than the estimated or budgeted overhead
2. The output (or hours worked) are more than the estimate or budget.

Under absorption takes place when:

1. The total overhead incurred exceeds the estimated overhead

2. The output are less than the estimate or budget

Situation 1: O/H recovered – O/H incurred= Positive value (it implies over absorption)

Situation 2: When, O/H Recovered- O/H incurred= Negative (it implies under absorption of O/H)

Situation 3: When, O/H Recovered- O/H incurred= Zero (it implies neither over absorption nor under absorption)

Problem sums

CU B.Com (H)

1. Calcutta engineering company has three production departments, X,Y,Z and one service department S, from the following particulars calculate the overhead to be allocated to departments X,Y,Z:

Rent	34,000
Power	18400
Depreciation on machinery	22,000
Indirect wages	5,300
Canteen expenses	5,700
Electricity	4,600

Further Information:

	X	Y	Z	S
Floor Space	2000	3,000	2,500	1,000
Light points	18	12	10	6
Cost of machine	80,000	50,000	60,000	10,000
Horse power ratio	3	2	4	1
No of workers	7	5	5	2
Direct Wages	15,000	16,000	18,000	4,000

Service rendered by the service department are to be apportioned to the production departments as X=50%, Y=25%, Z=25%

Overhead Analysis sheet

Primary Distribution

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Allocation and apportionment of factory overhead costs to the production and service departments.

Items of overhead	Basis of apportionment	Ratio	Total	Production Departments			Service department
Direct Wages	Allocation	----	4000				4000
Rent	floor space	4:6:5:2	34,000	8,000	12,000	10,000	4,000
Power	HP	3:2:4:1	18,400	5,520	3680	7360	1840
Depriciation	Cost of machine	8:5:6:1	22,000	8,800	5,500	6,600	1,100
Indirect Wages	Direct Wages	15:16:18:4	5300	1500	1600	1800	400
Canteen expenses	No of workers	7:5:5:2	5700	2100	1500	1500	600
Electricity	Light points	18:12:10:6	4600	1800	1200	1000	600

Secondary distribution

Re apportionment of service department costs to the production departments

Particulars	Total	Production			Service
		X	Y	Z	
Overhead as primary distribution	94,000	27,720	25480	28260	12540
Reapportionment of overhead of department S in the ratio (50:25:25)		6270	3135	3135	(12540)
Total departmental O/H	94000	33990	28615	31395	NIL

2. From the following particulars, calculate the overhead allocable to production department: P and Q. There are two also two service department S1 and S2. S1 renders service worth Rs 6,000 to S2 and the balance to P and Q as 3:2. S2 Renders services to P and Q as 9:1

Particulars	P	Q	S1	S2
Floor space (sq ft)	2500	2000	500	500
Assets(Rs in lakh)	5	2.5	1.5	0.5
HP of machines	500	250	200	50
No of workers	100	50	50	25
Light and fan points	50	30	20	20

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Expenses and Charges

Depreciation	95000
Insurance	7600
Canteen expenses	5400
Rent, rates and taxes	18,000
Power	10,000
Electricity	2400

Solution:

Overhead analysis sheet

Primary Distribution method

Allocation and apportionment of factory overhead costs to production and service department

Items of overhead	Basis of apportionment	Ratio	Total	Production department		Service department	
				P	Q	S1	S2
Depreciation	Value of asset	10:5:3:1	95,000	50,000	25,000	15,000	5,000
Insurance	Value of asset	10:5:3:1	7600	4,000	2,000	1200	400
Canteen expenses	No of workers	4:2:2:1	5400	2400	1200	1200	600
Rent, rates and taxes	Floor space	5:4:1:1	18000	8183	6545	1636	1636
Power	Hp of machines	10:5:4:1	10,000	5,000	25000	2000	500
Electricity	Light points	5:3:2:2	2400	1000	600	400	400
Total			**138400**	**70583**	**37845**	**21436**	**8536**

Secondary Distribution

Re appointment of service department costs to production department

Particulars	Production		Service	
	P	Q	S1	S2
Overhead as per primary distribution	**70583**	**37845**	**21436**	**8536**
Reappointment of overhead of S1 to S2 , P & Q (W1)	**9262**	**6174**	**(21436)**	**6000**
	79845	**44019**	**NIL**	**14536**
Reapportionment of overhead	**13082**	**1454**	**NIL**	**(14536)**

of S2 to P and Q in the ratio of 9:1(W2)				

WORKING:

1. Total overhead of department S1 21436
   Less: service provided to S2 6,000
   15,436
   Overhead to be distributed in the ratio in the ratio 3:2
   P: 15436*3/5=9262
   Q: 15436*2/5=6174
2. Total overhead of department S2 8536
   Less: service provided to S1 6,000
   14,536
   Overhead to be distributed in the ratio in the ratio 9:1
   P: 14536*9/10=13082
   Q: 14536*1/10=1454

3. <u>CU BCOM HONS</u>

A company has three departments and two service departments. Distribution summary of overheads is as follows:

Production departments A:	13,600
B:	14,700
C:	12,800
Service departments X	9,000
Y	3,000

The expenses of service departments are charged on a percentage basis which is as follows:

	A	B	C	X	Y
X depart	40%	30%	20%	---	10%
Y depart	30%	30%	20%	20%	--

Apportionment of the cost of service department by using repeated distribution method.

Particulars	Ratio	Production Department			Service	
		A	B	C	X	Y
Total departmental overhead	Given	13600	14700	12800	9000	3000
Distribution of overhead of service	4:3:2:0:1	3600	2700	1800	(9000)	900

depart X						
Distribution of overhead of service depart Y	3:3:2:2:0	1170	1170	780	780	(3900)
Distribution of overhead of service depart X	4:3:2:0:1	312	234	156	(780)	78
Distribution of overhead of service depart Y	3:3:2:2:0	23	23	16	16	(78)
Distribution of overhead of service depart X	4:3:2:0:1	6	5	3	(16)	2
Distribution of overhead of service depart Y	3:3:2:2:0	1	1	--	--	(2_
Total overhead after reapportionment		18712	18833	15555	--	--

4. CU BCOM H 2008

A company has three production departments and two service departments. Fot the month of march 2008, the departmental expenses were as follows:

Production department	Service department
A-10,000 B—15,000 C—12,000	X—25,000 Y—10,000

The expenses of service departments are apportioned as follows:

Particulars	A	B	C	X	Y
X	40%	30%	20%	--	10%
Y	30	40	10	20	--

Solution:

Under Simultaneous equation method:

Let x=total overhead of X department

Y=Total overhead of Y department

Total overhead transferred to service department X and Y can be expressed as:

X=25,000+20%of y (1)

Y= 10,000 +10%of X (2)

Or, x=25,000+.20y

Y=10,000+.10x

Solving the simultaneous equation

X=27,551 and Y=12,755

Reapportionment will be

Secondary distribution

Reapportionment of service department overhead to production department

Particulars	Production			Service	
	A	B	C	X	Y
Total departmental overhead	10,000	15,000	12,000	25,000	10,000
Distribution of overhead of service department X (4:3:2:0:1)	11,020	8266	5510	(27551)	2755
Distribution of overhead of service department Y (3:4:1:2:0)	3826	5102	1276	2551	(12755)
Total overhead after reapportionment	24846	28368	18786	Nil	nil

5. Ultd furnishes the following informations for 2004: **(CU BCOM H 2005)**

	Departments		
Particulars	Machining	Assembling	Stores and maintenance
Direct labour costs	2,00,000	1,00,000	---
Floor space occupies	50%	30%	20%
Factory overhead traceable to departments	1,84,000	1,06,000	40,000

Factory rent, taxes, and insurance not traceable to department 25,000. It has been decided that the costs of stores and maintenance can be equitably apportionment to the other departments on the basis of direct labour costs.

The machining department operated 40 hrs a week. There are five machines in the department and every machine remained idled for 80 hours during 2004 for holidays, repairs etc.

Calculate overhead absorption rate for machine department based on machine hours and overhead absorption rate for assembling department based on direct labour costs.

Solutions

Ultd

Primary distribution

Allocation and apportionment of factory overhead costs to the production and service department

				Production		service
Items of overhead	Basis of apportionment	Ratio	Total	M	A	S&M
Factory overhead	Allocation	---	3,30,000	1,84,000	1,06,000	40,000
Factory rent, rates and taxes	Floor space occupied	5:3:2	25,000	12,500	7500	5000
Total departmental overhead			3,55,000	1,96,000	1,13,500	45,000

Secondary distribution

Reapportionments of service department overhead to production department

				Production		service
Items of overhead	Basis of apportionment	Ratio	Total	M	A	S&M
Overhead as per primary distribution		---		196000	113500	45000
Reapportionment	Direct labour costs			30,000	15000	(45000)

Total departmental overhead				226500	128500	nil

Calculation of overhead absorption absorption rate

Machining depart:= Total departmental overhead/machine hours= 226500/10,000hrs= 22.65 per MH

{(40HRS*52W)-80}*5=10,000 HRS

Assembling Department:

Overhead absorption rate= Total departmental overhead/ direct labor cost *100= 1,28,500/1,00,00*100

=128.5% of direct labor costs

6. Rk ltd has three production departments P1, P2,P3 and two service depart S1 and S2

Rent and rates	5,000
Depriciation of machinery	10,000
Lighting	600
Power	1500
Canteen expenses	650
Sundries	10,000

Other informations

	P1	P2	P3	S1	S2
Floor area	2000	2500	3000	2000	500
No of light points	10	15	20	10	5
No of employees	25	20	10	5	5
Direct wages	3000	2000	3000	1500	500
Indirect wages	250	500	100	250	150
HP of machines	60	30	50	10	--
Value of machineries	60,000	80,000	1,00,000	5,000	5,000
Production hours worked	1892	3244	5903	--	---

Expenses of service departments S1 and S2 are apportioned below:

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

You are required to :

a) Compute overhead rate per production hour of each production department
b) Determine total costs of product Y which is processed through departments P1,P2,P3 for 4 hours, 6 hours and 11 Hours respectively. Given that direct material cost is 1,000 and direct labour cost is 600

Solutions:

RK LTD
Primary Distribution
Allocation and apportionment of factory overhead costs to production and service department

				Production			service	
Items of overhead	Basis	Ratio	Total	P1	P2	P3	S1	S2
Direct wages	Direct		2000				1500	500
Indirect wages	Allocation		1250	250	500	100	250	150
Rent and rates	Floor area	4:5:6:4:1	5000	1000	1250	1500	1000	250
Depreciation	Value of machine	12:16:20:1:1	10,000	2400	3200	4000	200	200
Lighting	Light points	2:3:4:2:1	600	100	150	200	100	50
Power	HP	6:3:5:1:0	1500	600	300	500	100	--
Canteen expenses	No of employees	5:4:2:1:1	650	250	200	100	50	50
Sundries	Direct wages	6:4:6:3:1	10,000	3000	2000	3000	1500	500
Total Overhead			31000	7600	7600	9400	4700	1700

Secondary distribution

Reapportionment of service department overhead to Production department

	P1	P2	P3	S1	S2
Overhead as per primary	7600	7600	9400	4700	1700

distribution					
Distribution of overhead of service department S1 (2:3:4:0:1) [4919]	984	1476	1967	(4919)	492
Distribution of overhead of service department S2 (4:3:2:1:0)[2192]	877	657	439	219	(2192)
Total overhead after reapportionment	9461	9733	11806	Nil	Nil
Production hours worked	1892	3244	5903		
Overhead recovery rate	5.00	3.00	2.00		

Workings

X=total overhead of service department S1

Y= total overhead of service department S2

Total overhead transferred to service department S1 and S2 can be expressed as:

X=4700+10%y

Y=1700+10%x

Solving the simultaneous equation

X=4919

Y=2192

COST SHEET

Particulars		
Direct materials		**1000**
Direct labour		**600**
	Prime cost	**1600**
Factory overhead P1(4*5)	**20**	
P2(6*3)	**18**	
P3(11*2)	**22**	

		60
TOTAL COST OF PRODUCTION		**1660**

CU BCOM ((H) 2004

7. The factory overhead cost of three productions departments of a company engaged in executing job orders for the accounting year for 2003-04 are as follows:
   A-19,300, B-4,200, C-Rs 4800

Overhead has been applied as under:

Department A- Rs 1.50 per machine for 14,000 hours

B- Rs 1.30 per direct labour hours for 3,000 hours

C---80% of direct labour cost of Rs6,000

Find out the amount of department wise under or over absorbed overhead and explain their treatment

Department	**Overhead**		**Under absorption**	**Over absorption**	**Net effect**
	INCURRED	ABSORBED			
A	19,300	21,000	----	1,700	
B	4,200	3,900	300	---	
C	4,800	4,800	--	---	
TOTAL	28,300	29,700	300	1,700	1400(over absorbed)

Working Notes:

Overhead Absorbed:

A:14,000*Rs1.50= 21,000 (absorbed on the basis of machine hours)

B: 3,000 *Rs1.30= 3900 (absorbed on the basis of direct labour hours)

C: 6,000 *80%=4800 (absorbed on the basis of direct labour cost)

29,700

Accounting Treatment of Overhead Absorption

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Taking all department (A,B and C) together, overhead have been over absorbed by Rs1400(Net). This amount will be credited to costing profits and loss account for the year 2003-2004