

PAPER – 4 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I : COST ACCOUNTING

QUESTIONS

1. (i) ABC Ltd. had an opening inventory value of Rs. 1760 (550 units valued at Rs.3.20 each) on 1st April 2010.

The following receipts and issues were recorded during April:

8 April	Receipts 1200 units	Rs.3.00 per unit
12 April	Issues 400 units	
15 April	Receipts 800 units	Rs.3.40 per unit
30 April	Issues 1850 units	

Using the FIFO method, what was the total value of the issues on 30 April 2010?

- (ii) From the following information, calculate labour turnover rate and flux rate:

No. of workers as on 01.04.2009 = 3800

No. of workers as on 31.03.2010 = 4200

During the year, 40 workers left while 160 workers were discharged, 750 workers were recruited during the year of whom 150 workers were recruited because of exists and the rest were recruited in accordance with expansion plans.

- (iii) The following data relate to the overhead expenditure of a contract cleaner at two activity levels:

Square meters cleaned	6,375	7,550
Overheads	Rs.36, 975	Rs.41, 792.5

What is the estimate of the overheads if 8,100 square meters are to be cleaned?

- (iv) In a period, 5640 kg of material were used at a total standard cost of Rs. 23,124. The material usage variance was Rs.246 adverse. What was the standard allowed weight of material for the period?
- (v) AB Ltd. is currently preparing its production budget for product Z for the forthcoming year. The sales director has confirmed that he requires 60000 units of product Z. Opening inventory is estimated to be 6500 units and the company wishes to reduce inventory at the end of the year by 50 per cent. How many units of product Z will need to be produced?

Basic Concepts

2. (i) Define Explicit costs. How is it different from implicit costs?
- (ii) Discuss cost classification based on variability and controllability.

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Material

3. EXE Limited has received an offer of quantity discounts on his order of materials as under:–

Price per tonne	Tonnes
Rs.	Nos.
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tonnes. The ordering cost per order is Rs. 1,200 and the stock holding cost is estimated at 20% of material cost per annum.

- (a) You are required to complete the most economical purchase level.
- (b) What will be your answer to the above question if there are no discount offered and the price per tonne is Rs. 1,500?

Material

4. (i) How is slow moving and non-moving item of stores detected and what steps are necessary to reduce such stocks?
- (ii) Distinguish between Bin Card and Stores Ledger.

Labour

5. The wage rate of Sheron Ltd. is Rs.6 per hour and its overtime rate are:

Evening – time and one-third

Week ends – double the time

During the previous year, the following hours were worked:

Normal time	2,00,000 clock hours
Time plus one-third	30,000 clock hours
Double time	20,000 clock hours

The following times have been worked as three jobs:

	Job I	Job II	Job III
	Clock hr.	Clock hr.	Clock hr.
Normal time	3,000	5,000	4,000
Evening overtime	300	600	1,050
Week-end overtime	100	50	300

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You are required to calculate the labour cost chargeable to each job in each of the following circumstances:

- (1) Where overtime is worked regularly throughout the year as the policy of the company due to labour shortage;
- (2) Where overtime is worked specifically at the request of the customer.

Overheads

6. (i) Discuss the step method and reciprocal service method of secondary distribution of overheads.
- (ii) ABC Ltd. has three production departments P₁, P₂ and P₃ and two service departments S₁ and S₂. The following data are extracted from the records of the Company for the month of March, 2010:

	Rs.
Rent and rates	62,500
General lighting	7,500
Indirect Wages	18,750
Power	25,000
Depreciation on machinery	50,000
Insurance of machinery	20,000

Other Information:

	P ₁	P ₂	P ₃	S ₁	S ₂
Direct wages (Rs.)	37,500	25,000	37,500	18,750	6,250
Horse Power of Machines 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:

	P ₁	P ₂	P ₃	S ₁	S ₂
S ₁	20%	30%	40%	—	10%
S ₂	40%	20%	30%	10%	—

Required:

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

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- (b) 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.

Method of Costing (I) – Job Costing

7. From the records of a manufacturing company, the following budgeted details are available:

	Rs.	Rs.
Direct Materials		99,500
Direct Wages:		
Machine Shop (6,000 hours)	31,500	
Assembly Shop (5,000 hours)	<u>24,000</u>	55,500
Works Overhead:		
Machine Shop	44,100	
Assembly Shop	<u>25,900</u>	70,000
Administrative Overhead		45,000
Selling Overhead		40,500
Distribution Overhead		31,050

Assuming that the company follows absorption method of costing, you are required to:

- (a) Prepare a Schedule of Overhead Rates from the figures available stating the basis of overhead recovery rates used under the given circumstances.
- (b) Work out a Cost Estimate for the following job based on overhead so computed.

Direct Material:	12.5 kg @ Rs.16.80/kg
	7.5 kg @ Rs.20.00/kg
Direct labour: (On the basis of hourly rate	Machine shop 15 hours
For machine shop and assembly shop)	Assembly shop 21 hours

Method of Costing (I)- Contract Costing

8. Shri Ram Ltd. commenced work on 1st April, 2009 on a contract of which the agreed price was Rs.10 lakh. The following expenditure was incurred during the year upto 31st March, 2010:

	Rs.
Wages	2,80,000
Plant	70,000
Materials	2,10,000
Head office expenses	25,000

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Materials costing Rs.20,000 proved unsuitable and were sold for Rs.23,000 and a part of the plant was scrapped and sold for Rs.3,400.

Of the contract price Rs.4,80,000 representing 80% of work certified had been received by 31st March, 2010 and on that date the value of the plant on the job was Rs.16,000 and the value of materials was Rs.6,000. The cost of work done but not certified was Rs.50,000.

It was decided to (a) estimate what further expenditure would be incurred in completing the contract; (b) compute from the estimate and the expenditure already incurred, the total profit that would be made on the contract and (c) ascertain the amount of profit to be taken to the credit of Profit and Loss Account for the year ending 31st March, 2010. While taking profit to the credit of Profit and Loss Account, the portion of the total profit should be taken which the value of work certified bears to the contract price. Details of the estimates were as follows:

- (i) That the contract would be completed by 30th September, 2010.
- (ii) The wages to complete would amount to Rs.1,69,500.
- (iii) That materials in addition to those in stock on 31st March, 2010 would cost Rs.1,00,000.
- (iv) That further Rs.30,000 would have to be spent on plant and the residual value of the plant on 30th September, 2010 would be Rs.12,000.
- (v) The head office expenses to the contract would be at the same annual rate as in 2009-10.
- (vi) That claims, temporary maintenance and contingencies would require Rs.18,000.

Prepare contract account for the year ended 31st March, 2010 and show your calculations of the sum to be credited to Profit and Loss Account for the year.

Method of Costing (II) – Process Costing

9. The following details are extracted from the costing records of an oil refinery for the week ended 30th September, 2010.

Purchase of 1000 tonnes of copra Rs.4,00,000.

	Crushing plant	Refinery plant	Finishing
	Rs.	Rs.	Rs.
Cost of labour	5,000	2,000	3,000
Electric power	1,200	7,20	4,80
Sundry material	200	4,000	---
Repairs to machinery and plant	5,60	6,60	2,80
Steam	1,200	9,00	900
Factory expenses	2,640	1,320	4,40
Cost of casks	--	----	15,000

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600 tonnes of crude oil was produced.

500 tonnes of oil was produced by refining process.

496 tonnes of refined oil was finished for delivery.

Copra sack sold Rs.800.

350 tonnes of copra residue sold Rs.22,000.

Loss in weight in curshing 50 tonnes.

90 tonnes by-product was obtained from refining process valued at Rs.13,500. You are required to show the accounts in respect of each of the following stages of manufacture for the purpose of arriving at the cost per tonne of each process and also the total cost per tonne of finished oil.

(a) Copra crushing process; (b) Refining process; (c) Finishing process.

Standard Costing

10. Shinestar Ltd. company manufactures a commercial product for which the standard cost per unit is as follows:

Material:	Rs.
5 kg. @ Rs.4 per kg.	20
Labour:	
3 hours @ Rs.10 per hour	30
Overhead	
Variable: 3 hours @ Re.1	3
Fixed: 3 hours @ Rs.1.50	1.50
Total	<u>54.50</u>

During Jan. 2010, 600 units of the product were manufactured at the cost shown below:

Materials purchased:	Rs.
5,000 kg. @ Rs.4.10 per kg.	20,500
Materials used:	
3,500 kg.	
Direct Labour:	
1,700 hours @ Rs.9	15,300
Variable overhead	1,900
Fixed overhead	900
Total	<u>38,600</u>

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The flexible budget required 1,800 direct labour hours for operation at the monthly activity level used to set the fixed overhead rate.

Calculate:

(a) Material price variance, (b) Material Usage variance; (c) Labour rate variance; (d) Labour efficiency variance; (e) Variable overhead expenditure variance; (f) Variable overhead efficiency variance; (g) Fixed overhead expenditure variance; (h) Fixed overhead volume variance; (i) Fixed overhead capacity variance; and (j) Fixed overhead efficiency variance.

Also reconcile the standard and actual cost of production.

Marginal Costing

11. Anika Ltd. can produce 4,00,000 units of a product per annum at 100% capacity. The variable production costs are Rs. 40 per unit and the variable selling expenses are Rs. 12 per sold unit. The budgeted fixed production expenses were Rs. 24,00,000 per annum and the fixed selling expenses were Rs. 16,00,000. During the year ended 31st March, 2010, the company worked at 80% of its capacity. The operating data for the year are as follows:

Production	3,20,000 units
Sales @ Rs. 80 per unit	3,10,000 units
Opening stock of finished goods	40,000 units

Fixed production expenses are absorbed on the basis of capacity and fixed selling expenses are recovered on the basis of period.

You are required to prepare Statements of Cost and Profit for the year ending 31st March, 2010:

- (i) On the basis of marginal costing
- (ii) On the basis of absorption costing.

Budgetary Control

12. Enron manufacturers can produce 4,000 units of a certain product at 100% capacity. The following information is obtained from the books of account:

	January 2010	February 2010
Units produced	2400	3200
Repair and maintenance	470	530
Power	1700	1900
Shop Labour	600	800
Consumable stores	1200	1600
Salaries	1000	1000
Inspection	180	220
Depreciation	1400	1400

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The rate of production per hour is 10 units. Direct material per unit is Rs. 1 and direct wages per hour is Rs. 4. You are required to – (i) compute the cost of production at 100%, 90% and 70% capacity showing the available, fixed and semi-fixed items under the flexible budget; and (ii) find out the overhead absorption rate per unit at 90% capacity.

13. (a) What is 'Defective Work'? How it is accounted for in cost accounts?
(b) How will you treat the research and development costs in connection with.
(i) job undertaken on behalf of a customer; and
(ii) improvement in existing products ?
(c) Give the reasons for disagreement of Profits as per Financial accounts and Cost accounts? Discuss?

SUGGESTED ANSWERS/HINTS

1. (i) Under FIFO the 400 units issued on 12 April would have been priced at Rs.3.20 from the opening inventory. Therefore the remaining 150 units from the opening inventory make up the first part of the batch issued on 30 April 2010:

	Rs.
150 units at Rs.3.20	480
1200 units at Rs.3.00	3,600
<u>500</u> units at Rs.3.40	<u>1,700</u>
<u>1850</u>	<u>5780</u>

Total value of the issues on 30th April 2010 is Rs. 5780.

- (ii) **Labour Turnover Rate**

$$(i) \quad \text{Separation Method} = \frac{\text{Worker s left} + \text{Worker s Discharged}}{\text{Average number}} \times 100$$

$$= \frac{40 + 160}{(3,800 + 4,200) \div 2} = \frac{200}{4,000} \times 100 = 5\%$$

$$(ii) \quad \text{Replacement Method} = \frac{\text{Worker's replaced}}{\text{Average number}} \times 100$$

$$= \frac{150}{4,000} \times 100 = 3.75\%$$

$$(iii) \quad \text{Flux Rate} = \frac{\text{Worker s Separations} + \text{Worker s Re placements}}{\text{Average number}} \times 100$$

$$= \frac{200 + 150}{4,000} \times 100 = 8.75\%$$

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- (iii) 1. Variable overheads per square metre:

Extra m² cleaned = 7550 – 6375 = 1175

Extra overhead cost = Rs. 41792.5 – Rs. 36,975 = Rs. 4817.5

Variable overhead per m² = Rs. 4817.5/1175 = Rs. 4.10

2. Fixed overhead:

	Rs.
Total overheads of cleaning 6375 m ²	= 36975
Variable overheads = 6375 x Rs. 4.10	= <u>26137.5</u>
Fixed overhead (Rs. 36,975- Rs. 26, 137.5)	= <u>10837.5</u>

3. Total overheads for 8100 m²:

	Rs.
Variable overhead = 8100 x Rs. 4.10	= 33210
Fixed overhead	= <u>10837.5</u>
	<u>44047.5</u>

- (iv) The usage must have been higher than standard because the usage variance is adverse.

Usage variance is equal to the excess usage multiplied by the standard price per kg of material.

Standard price per kilogram of material: $\frac{\text{Rs. } 23,124}{\text{Rs. } 5640} = \text{Rs. } 4.10$

Number of kilogram excess usage: $\frac{\text{Rs. } 246}{\text{Rs. } 4.1} = 60 \text{ kg.}$

Standard usage: 5640 kg – 60 kg = 5580 kg.

- (v) Budgeted Production = Budgeted sales + Budgeted closing inventory – Budgeted opening inventory

	Units
Required by sales	60000
Required closing inventory	3250
Less opening inventory anticipated	<u>(6500)</u>
Production level	<u>56750</u>

Basic Concepts

2. (i) Explicit costs: These costs are also known as out of pocket costs. They refer to those costs which involves immediate payment of cash. Salaries, wages, postage and telegram, interest on loan etc. are some examples of explicit costs because they involve immediate cash payment. These payments are recorded in the books of account and can be easily measured.

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Main points of difference: The following are the main points of difference between explicit and implicit costs.

- (a) Implicit costs do not involve any immediate cash payment. As such they are also known as imputed costs or economic costs.
 - (b) Implicit costs are not recorded in the books of account but yet, they are important for certain types of managerial decisions such as equipment replacement and relative profitability of two alternative courses of action.
- (ii) Cost classification based on variability

Fixed cost – These are costs, which do not change in total despite changes of a cost driver. A fixed cost is fixed only in relation to a given relevant range of the cost driver and a given time span. Rent, insurance, depreciation of factory building and equipment are examples of fixed costs where the final product produced is the cost object.

Variable costs – These are costs which change in total in proportion to changes of cost driver. Direct material, direct labour are examples of variable costs, in cases where the final product produced is the cost object.

Semi-variable costs – These are partly fixed and partly variable in relation to output e.g. telephone and electricity bill.

Cost classification based on controllability

Controllable costs – Are incurred in a particular responsibility center and relate to a defined time span. They can be influenced by the action of the executive heading the responsibility center e.g. direct costs.

Uncontrollable costs – Are costs are influenced by the action of the responsibility center manager e.g. expenditure incurred by the tool room are controllable by the foreman in charge of that section, but the share of tool room expenditure which are apportioned to the machine shop are not controllable by machine shop foreman.

Material

3. (a)

Total Annual Requirement	Order Size (units)	No. of Orders	Cost of Inventory S × Per unit cost	Ordering Cost	Carrying Cost p.u. p.a.	Total Cost
(S)	(q)	$\left(\frac{S}{q}\right)$		$\left(\frac{S}{q} \times \text{Rs.1200}\right)$	$\frac{1}{2} \times q \times 20\% \text{ of per unit cost}$	(4+5+6)
			Rs.	Rs.	Rs.	Rs.
1	2	3	4	5	6	7
5000 units	400	12.5	60,00,000 (5,000 × Rs.1200)	15,000	48,000 (200 × Rs. 240)	60,63,000

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500	10	59,00,000 (5,000 × Rs.1180)	12,000	59,000 (250 × Rs. 236)	59,71,000
1,000	5	58,00,000 (5,000 × Rs.1160)	6,000	1,16,000 (500 × Rs. 232)	59,22,000
2,000	2.5	57,00,000 (5,000 × Rs.1140)	3,000	2,28,000 (1,000 × Rs. 228)	59,31,000
3,000	1.666	56,00,000 (5,000 × Rs.1120)	2,000	3,36,000 (1500 × Rs. 224)	59,38,000

The above table shows that the total cost of 5000 units including ordering and carrying cost is minimum (Rs. 59,22,000) when the order size is 1000 units. Hence the most economical purchase level is 1000 units.

(b) $EOQ = \sqrt{\frac{2SC_o}{iC_i}}$ Where S is the annual inventory requirement, C_o is the ordering cost per order and iC_i is the carrying cost per unit per annum.

$$= \sqrt{\frac{2 \times 5000 \times \text{Rs.}1200}{20\% \times \text{Rs.}1500}} = 200 \text{ tonnes}$$

Material

4. (i) Detection of slow moving and non-moving item of stores:

The existence of slow moving and non-moving item of stores can be detected in the following ways.

- By preparing and scanning periodic reports showing the status of different items or stores.
- By calculating the stock holding of various items in terms of number of days/ months of consumption.
- By computing ratios periodically, relating to the issues as a percentage of average stock held.
- By implementing the use of a well designed information system.

Necessary steps to reduce stock of slow moving and non-moving item of stores:

- Proper procedure and guidelines should be laid down for the disposal of non-moving items, before they further deteriorates in value.
- Diversify production to use up such materials.
- Use these materials as substitute, in place of other materials.

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(ii)

Bin Card

Bincards are maintained in the stores and are serving the purpose of stock register.

Entries in it are posted by the issue clerk. He records the quantity about receipts, issues and closing balance along with code number of material, maximum, minimum and reorder levels.

Here transactions are posted individually.

Posting is done at the time of issue of material.

Stores Ledger

Stores ledger is maintained in the cost accounts department.

Here entries are posted by the stores ledger clerk. He records the quantities and value about receipts, issues and closing balance along with code number of material, maximum, minimum and reorder levels.

Here transactions can be posted periodically.

Posting . is done after the issue of materials.

Labour

5.

Basic rate	- Rs.6 per hour
Evening overtime	-(Rs.6 plus Rs.2) Rs.8 per hour
Week-end overtime	- Rs.12 per hour

Wages of the previous year:

Normal time	2,00,000 hours @ Rs.6/hr.	=	Rs.12,00,000
Evening overtime	30,000 hours @ Rs.8 /hr.	=	Rs.2,40,000
Week-end overtime	20,000 hours @ Rs.12/hr.	=	Rs.2,40,000
	2,50,000 Hours		<u>Rs.16,80,000</u>

Average or inflated rate per hour = $\text{Rs.16,80,000} \div 2,50,000 \text{ hrs.} = \text{Rs.6.72}$

- (1) Where overtime is worked regularly throughout the year as the policy of the company due to labour shortage, it becomes a part of labour cost. Each job will be charged with the labour cost for the total number of hours worked at the inflated rate. Thus:

Job No. I	3,400 hours @ Rs.6.72 = Rs.22,848
Job No. II	5,650 hours @ Rs.6.72 = Rs.37,968
Job No.III	5,350 hours @ Rs.6.72 = Rs.35,952

- (2) Where overtime is worked specifically at the request of the customer, overtime is to be charged to the job to be borne by the customer. In this case, each job will be charged as follows:

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			Rs.
Job No. I	3,000 hours @ Rs.6 per hour	=	18,000
	300 hours @ Rs.8 per hour	=	2,400
	100 hours @ Rs.12 per hour	=	1,200
	Total		<u>21,600</u>
Job No. II	5,000 hours @ Rs.6 per hour	=	30,000
	600 hours @ Rs.8 per hour	=	4,800
	50 hours @ Rs.12 per hour	=	600
	Total		<u>35,400</u>
Job No. III	4,000 hours @ Rs.6 per hour	=	24,000
	1050 hours @ Rs.8 per hour	=	8,400
	300 hours @ Rs.12 per hour	=	3,600
	Total		<u>36,000</u>

Overheads

6. (i) Step method and Reciprocal Service method of secondary distribution of overheads

Step method: This method gives cognisance to the service rendered by service department to another service dep't, thus sequence of apportionments has to be selected. The sequence here begins with the dep't that renders service to the max number of other service dep't. After this, the cost of service dep't serving the next largest number of dep't is apportioned.

Reciprocal service method: This method recognises the fact that where there are two or more service dep't, they may render service to each other and, therefore, these inter dep't services are to be given due weight while re-distributing the expense of service dep't. The methods available for dealing with reciprocal servicing are:

- Simultaneous equation method
- Repeated distribution method
- Trial and error method

(ii) (a)

Primary Distribution Summary

Item of cost	Basis of apportionment	Total (Rs.)	P ₁ (Rs.)	P ₂ (Rs.)	P ₃ (Rs.)	S ₁ (Rs.)	S ₂ (Rs.)
Rent and Rates	Floor area 4 : 5 : 6 : 4 : 1	62,500	12,500	15,625	18,750	12,500	3,125

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General lighting	Light points 2 : 3 : 4 : 2 : 1	7,500	1,250	1,875	2,500	1,250	625
Indirect wages	Direct wages 6 : 4 : 6 : 3 : 1	18,750	5,625	3,750	5,625	2812.5	937.5
Power	Horse Power of machines used 6 : 3 : 5 : 1	25,000	10,000	5,000	8,333	1,667	—
Depreciation of machinery	Value of machinery 12 : 16 : 20 : 1 : 1	50,000	12,000	16,000	20,000	1,000	1,000
Insurance of machinery	Value of machinery 12 : 16 : 20 : 1 : 1	20,000	4,800	6,400	8,000	400	400
		<u>1,83,750</u>	<u>46,175</u>	<u>48,650</u>	<u>63,208</u>	<u>19,630</u>	<u>6,088</u>

Overheads of service cost centres Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2 .

$$S_1 = 19,630 + 0.10 S_2$$

$$S_2 = 6,088 + 0.10 S_1$$

Substituting the value of S_2 in S_1 we get

$$S_1 = 19,630 + 0.10 (6,088 + 0.10 S_1)$$

$$S_1 = 19,630 + 608.8 + 0.01 S_1$$

$$0.99 S_1 = 20,238.8$$

$$\therefore S_1 = \text{Rs. } 20,443.$$

$$\therefore S_2 = 6,088 + 0.10 \times 20,443.$$

$$= \text{Rs. } 8,132.$$

Secondary Distribution Summary

Particulars	Total Rs.	P_1 Rs.	P_2 Rs.	P_3 Rs.
Allocated and Apportioned over-heads as per primary distribution	1,58,033	46,175	48,650	63,208
S_1	20,443	4,089	6,133	8,177
S_2	<u>8,132</u>	<u>3,253</u>	<u>1,626</u>	<u>2,440</u>
		<u>53,517</u>	<u>56,409</u>	<u>73,825</u>

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Overhead rate per hour

	P ₁	P ₂	P ₃
Total overheads cost	Rs. 53,517	Rs. 56,409	Rs. 73,825
Production hours worked	6,225	4,050	4,100
Rate per hour (Rs.)	Rs. 8.60	Rs. 13.93	Rs. 18.01

(b)

Cost of Product X

Direct material	Rs. 625
Direct labour	Rs. 375
Prime cost	Rs. 1,000
Production on overheads	
P ₁ 5 hours × Rs. 8.60 = 43	
P ₂ 3 hours × Rs. 13.93 = 41.79	
P ₃ 4 hours × Rs. 18.01 = <u>72.04</u>	<u>Rs. 156.83</u>
Factory cost	<u>Rs. 1,157</u>

Method of Costing (I) – Job Costing

7. (a)

Cost Sheet

		Rs.
Direct materials		99,500
Direct wages:		
Machine shop	31,500	
Assembly shop	24,000	55,500
	Prime Cost	<u>155,000</u>
Works overhead:		
Machine shop	44,100	
Assembly shop	25,900	70,000
	Work Cost	<u>2,25,000</u>
Administration overhead		45,000
	Cost of Production	<u>2,70,000</u>
Selling overhead		40,500
Distribution overhead		31,050
	Total Cost	<u>3,41,550</u>

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Schedule of Overhead Rate

- (i) Works Overhead per hour = (Overhead Amount ÷ Hours)

Machine shop = $(44,100 \div 6,000) = \text{Rs.}7.35$ per hour

Assembly shop = $(25,900 \div 5,000) = \text{Rs.}5.18$ per hour

- (ii) Administrative Overhead as a % of works cost

$$= \frac{45,000}{2,25,000} \times 100 = 20\%$$

- (iii) Selling and distribution overhead as % of works cost

$$= \frac{40,500 + 31,050}{2,25,000} \times 100 = 31.80\%$$

Labour hour rates are calculated as under:

Machine shop = $\text{Rs.}31,500 \div 6,000 \text{ hrs.} = \text{Rs.}5.25$

Assembly shop = $\text{Rs.}24,000 \div 5,000 \text{ hrs.} = \text{Rs.}4.80$

(b) Estimate for Job

	Rs.	Rs.
Direct Materials		
(i) 12.5 kg @ Rs.16.80 per kg	210	
(ii) 7.5 kg @ Rs.20 per kg	<u>150</u>	360.00
Direct Labour		
Machine shop (15 hrs. @ Rs.5.25)	78.75	
Assembly shop (21 hrs. @ 4.80)	<u>100.8</u>	<u>179.55</u>
Prime Cost		539.55
Works Overhead		
Machine shop (15 hours @ Rs.7.35)	110.25	
Assembly shop (21 hours @ 5.18)	<u>108.78</u>	<u>219.03</u>
Works Cost		758.58
Administration overhead (20% of works cost)		<u>151.72</u>
Cost of Production		910.30
Selling and distribution cost (31.8% of works cost)		<u>241.23</u>
Total Cost		<u>1151.53</u>

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Method of Costing (I)- Contract Costing

8. **Contract Account** (for the year ending 31st March 2010)

	Rs.			Rs.
To Materials	2,10,000	By Work-in-progress:		
To Wages	2,80,000	Certified (4, 80,000 ÷ 80%)		6,00,000
To Plant	70,000	Uncertified		50,000
To Head office expenses	25,000	By Plant at site		16,000
To P & L A/c (Profit on materials)	3,000	By Plant sold		3,400
To Notional profit c/d	1,10,400	By Materials at site		6,000
		By Materials sold		23,000
	<u>6,98,400</u>			<u>6,98,400</u>
To P & L A/c*	72,240	By Notional profit b/d		1,10,400
To Balance (Reserve)	38,160			
	<u>1,10,400</u>			<u>1,10,400</u>

*Calculation of profit transferred to P & L Account

Transfer of profit to Profit and Loss Account is on the basis of estimated profit as shown below:

Total expenditure (upto 31.3.2010)	Rs.
Materials (2,10,000 – 20,000- 6,000)	1,84,000
Wages	2,80,000
Head office expenses	25,000
Plant (70,000 – 16,000 – 3,400)	<u>50,600</u>
Total	5,39,600
Add: Further expenditure estimate to complete:	
Materials (10,000 + 6,000)	1,06,000
Wages	1,69,500
Plant (16,000 + 30,000 – 12,000)	34,000
Head office expenses (25,000 ÷ 2)	12,500
Contingencies	<u>18,000</u>
Total estimated cost	<u>8,79,600</u>
Contract price	10,00,000

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Total estimated profit (10, 00,000 – 8, 79,600) = Rs. 1, 20,400

Profit transferred to P & L A/c = Estimated profit $\times \frac{\text{Work in progress certified}}{\text{Contract price}}$

$$= 1,20,400 \times \frac{6,00,000}{10,00,000}$$

= 72,240

Method of Costing (II) – Process Costing

9. Copra Crushing Process Account

	Particulars	Tonnes	Rs.		Particulars	Tonnes	Rs.
To	Copra used	1000	4,00,000	By	Sale of copra residue	350	22,000
To	Labour		5,000	By	Loss	50	---
To	Electric power		1,200	By	Sale of copra sacks		800
To	Sundry material		200	By	Cost of crude oil (Rs.646.67 per tonne)	600	3,88,000
To	Repairs to machinery		560				
To	Steam		1,200				
To	Factory expenses		<u>2,640</u>				
		1,000	<u>4,10,800</u>			1000	<u>4,10,800</u>

Refining Process Account

	Particulars	Tonnes	Rs.		Particulars	Tonnes	Rs.
To	Crude oil (Tr.)	600	3,88,000	By	Sale of by-products	90	13,500
To	Labour		2,000	By	Loss	10	---
To	Electric power		720	By	Cost of refining oil (Rs.768.2 per tonne)	500	3,84,100
To	Sundry material		4,000	By			
To	Repair to machinery		660				
To	Steam		900				
To	Factory expenses		<u>1320</u>				
		600	<u>3,97,600</u>			600	<u>3,97,600</u>

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Finishing Process Account

	Particulars	Tonnes	Rs.		Particulars	Tonnes	Rs.
To	Refining process (Tr.)	500	3,84,100	By	Loss	4	---
To	Labour		3,000	By	Cost of finished oil (Rs.784.68 per tonne)	496	3,89,200
To	Electric power		480				
To	Repair to machinery		280				
To	Steam		900				
To	Factory expenses		440				
To		500	3,89,200			500	3,89,200

Finished Stock Account

	Particulars	Tonnes	Rs.		Particulars	Tonnes	Rs.
To	Finishing process	496	3,89,200	By	Balance (Rs.814.92 per tonne)	496	4,04,200
To	Cost of casks		<u>15,000</u>				
		496	<u>4,04,200</u>			496	<u>4,04,200</u>

Standard Costing

10.

- (a) Material price variance:

$$= (\text{Standard price} - \text{Actual Price}) \times \text{Actual quantity}$$

$$= (\text{Rs.4} - \text{Rs.4.10}) \times 5,000 = \text{Rs.500 Adv.}$$
- (b) Material usage variance:

$$= (\text{Std. quantity for actual output} - \text{Actual qty.}) \times \text{Std. price}$$

$$= (600 \times 5 - 3,500) \times 4 = \text{Rs.2,000 Adv.}$$
- (c) Labour Rate Variance:

$$= (\text{Standard rate} - \text{Actual rate}) \times \text{Actual hours}$$

$$= (\text{Rs.10} - \text{Rs.9}) \times 1,700 = \text{Rs.1,700 Fav.}$$
- (d) Labour Efficiency Variance:

$$= (\text{Standard hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$$

$$= (600 \times 3 - 1,700) \times \text{Rs.10}$$

$$= \text{Rs.1,000 Fav.}$$

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- (e) Variable Overhead Expenditure Variance
 $= (\text{Actual Hours} \times \text{Standard Rate}) - \text{Actual Overhead}$
 $= (1700 \times \text{Rs. 1}) - \text{Rs. 1900}$
 $= \text{Rs. 200 Adv.}$
- (f) Variable Overhead Efficiency Variance:
 $= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Std. rate}$
 $= (600 \times 3 - 1,700) \times \text{Rs. 1} = \text{Rs. 100 Fav.}$
- (g) Fixed Overhead Expenditure Variance:
 $= (\text{Budgeted overhead} - \text{Actual overhead})$
 $= (1,800 \times 0.50 - 900) = \text{Nil}$
- (h) Fixed Overhead Volume Variance:
 $= (\text{Std. hours for actual output} - \text{Budgeted hours}) \times \text{Std. rate}$
 $= (600 \times 3 - 1,800) \times \text{Rs. 0.50} = \text{Nil}$
- (i) Fixed Overhead Capacity Variance:
 $= (\text{Budgeted hours} - \text{Actual Hours}) \times \text{Standard rate}$
 $= (1,800 - 1,700) \times \text{Rs. 0.50} = \text{Rs. 50 Adv.}$
- (j) Fixed Overhead Efficiency Variance:
 $= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$
 $= (600 \times 3 - 1,700) \times \text{Rs. 0.50} = \text{Rs. 50 Fav.}$

Verification:	Rs.	Rs.	Rs.	Rs.
Overhead recovered: 600 units @ Rs.4.50				2,700
Actual Overhead:				
Variable		1,900		
Fixed		900		2,800
				<u>100 Adv.</u>
Variable expenditure variance				200
Variable Efficiency variance				100 Fav.
Fixed expenditure variance				Nil
Fixed overhead volume variance				Nil
				<u>100 Adv.</u>

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Reconciliation Statement

Standard Cost: 600 units @	54.50	32,700	
Actual Cost:	38,600		
Less: Material Stock at standard cost: 1,500 × 4	<u>6,000</u>	<u>32,600</u>	100 Fav.
Variances:	Adv.	Fav.	
	Rs.	Rs.	
Material price	500		
Material usage	2,000		
Labour rate		1,700	
Labour efficiency		1,000	
Variable expenditure	200		
Variable efficiency		100	
Total	<u>2,700</u>	<u>2,800</u>	<u>100 Fav.</u>

Note : As Fixed Overhead Volume Variance is Nil therefore it has not been included in the reconciliation statement.

Marginal Costing

**11. (i) Statement of Cost and Profit under Marginal Costing
for the year ending 31st March, 2010
Output = 3,20,000 units**

Particulars	Amount (Rs.)	Amount (Rs.)
Sales: 3,10,000 units @ Rs. 80		2,48,00,000
Less: Marginal cost / variable cost:		
Variable cost of production (3,20,000 × Rs. 40)	1,28,00,000	
Add: Opening stock 40,000 units @ Rs. 40	<u>16,00,000</u>	
		1,44,00,000
Less: Closing Stock		
[(3,20,000 + 40,000 – 3,10,000) @ Rs. 40 = 50,000 units @ Rs. 40]	<u>20,00,000</u>	
Variable cost of production of 3,10,000 units		1,24,00,000

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Add: Variable selling expenses @ Rs. 12 per unit	<u>37,20,000</u>	<u>1,61,20,000</u>
Contribution (sales – variable cost)		86,80,000
Less: Fixed production cost	24,00,000	
Fixed selling expenses	<u>16,00,000</u>	<u>40,00,000</u>
Actual profit under marginal costing		<u>46,80,000</u>

(ii) **Statement of Cost and Profit under Absorption Costing**
for the year ending 31st March, 2010
Output = 3,20,000 units

<i>Particulars</i>	<i>Amount (Rs.)</i>	<i>Amount (Rs.)</i>
Sales: 3,10,000 units @ Rs. 80		2,48,00,000
Less: Cost of sales:		
Variable cost of production (3,20,000 @ Rs. 40)	1,28,00,000	
Add: Fixed cost of production absorbed 3,20,000 units @ Rs. 6 ⁽¹⁾	<u>19,20,000</u>	
	1,47,20,000	
Add: Opening Stock: $40,000 \times \frac{1,47,20,000}{3,20,000}$	18,40,000	
	<u>1,65,60,000</u>	
Less: Closing Stock: $50,000 \times \frac{1,47,20,000}{3,20,000}$	23,00,000	
	<u>1,42,60,000</u>	
Production cost of 3,10,000 units		
Selling expenses:		
Variable: Rs. 12 × 3,10,000 units	37,20,000	
Fixed	<u>16,00,000</u>	<u>1,95,80,000</u>
Unadjusted profit		52,20,000
Less: Overheads under absorbed: ⁽²⁾		
Fixed production overheads		<u>4,80,000</u>
Actual profit under absorption costing		<u>47,40,000</u>

Workings:

- Absorption rate for fixed cost of production = $\frac{\text{Rs. } 24,00,000}{4,00,000 \text{ units}} = \text{Rs. } 6 \text{ per unit.}$

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2. Fixed production overhead under absorbed = Rs. (24,00,000 – 19,20,000) = Rs. 4,80,000.

Budgetary Control

12. Working Notes:

1. Fixed overheads

	Rs.
Depreciation	1400
Salaries	<u>1000</u>
Total	2400

2. Variable cost per unit

Shop Labour @ Rs. 0.25 per unit Consumable Stores @ Rs. 0.50 per unit

3. Semi Variable costs segregated into fixed and variable components

i. Variable cost per unit = Change in cost / Change in volume

ii. Fixed cost = Total cost – (No. of units × Variable cost per unit)

Power

$$\begin{aligned}\text{Variable cost} &= (\text{Rs. } 1900 - \text{Rs. } 1700) / (3200 - 2400) \\ &= (\text{Rs. } 200) / 800 \\ &= \text{Rs. } 0.25 \text{ per unit} \\ \text{Fixed cost} &= 1700 - (2400 \text{ Unit} \times 0.25) \\ &= 1700 - 600 \\ &= 1100\end{aligned}$$

Repair and Maintenance

$$\begin{aligned}\text{Variable component} &= (\text{Rs. } 530 - \text{Rs. } 470) / (3200 - 2400) \\ &= (\text{Rs. } 60) / 800 \\ &= \text{Rs. } 0.075 \text{ per unit} \\ \text{Fixed cost} &= 470 - (2400 \times 0.075) \\ &= 470 - 180 = 290\end{aligned}$$

Inspection

$$\begin{aligned}\text{Variable cost} &= (220 - 180) / (3200 - 2400) \\ &= (\text{Rs. } 40) / 800 \\ &= \text{Rs. } 0.05 \text{ per unit} \\ \text{Fixed cost} &= \text{Rs. } 180 - (2400 \times 0.05) \\ &= \text{Rs. } 180 - 120 = \text{Rs. } 60\end{aligned}$$

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Flexible Budget for Cost of Production			(Rs.)
Capacity level	70%	90%	100%
Units produced	2800	3600	4000
Production hours	280	360	400
Direct material (@ Rs. 1 p.u.)	2800	3600	4000
Direct wages (@ Rs. 4 per hour)	1120	1440	1600
Total (i)	3920	5040	5600
Prime cost			
Variable overheads			
Shop Labour (@ Rs. 0.25 p.u.)	700	900	1000
Consumable Stores (@ Rs. 0.50 p.u.)	1400	1800	2000
Power (@ Rs. 0.25 p.u.)	700	900	1000
Repairs and (@ Rs. 0.075 p.u.)	210	270	300
Maintenance (@ Rs. 0.05 p.u.)	140	180	200
Inspection			
Total (ii)	3150	4050	4500
Fixed Overheads			
Depreciation	1400	1400	1400
Salaries	1000	1000	1000
Power	1100	1100	1100
Repairs and	290	290	290
maintenance	60	60	60
Inspection			
Total (iii)	3850	3850	3850
Total cost of production (i) + (ii) + (iii)	10920	12940	13950
Cost of Production per unit	3.9	3.59	3.49

Total overheads at 90% capacity (Rs.)

Variable overheads	4050
Fixed overheads	<u>3850</u>
Total overheads	7900

- i. Overhead absorption rate per unit = Rs. 7900/3600 = Rs. 2.19 per unit
- ii. Overhead absorption rate per production hour = Rs. 7900/360 hrs.
= Rs. 21.94 per production hour

- 13. (a)** 'Defective Work' is the work output which does not meet out the prescribed laid down standard specifications. Such a situation may arise due to various causes, such as use of sub-standard materials, bad workmanship, carelessness in planning, laxity in

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inspection, etc. Defectives can be reworked or reconditioned by the application of additional material, labour and/or processing and may be brought to the point of either standard work/products or sub-standard products. Reworked units of defectives may be sold through regular channels as first or seconds as the case may be.

Cost Accounting treatment: It is concerned with the accounting for costs of their rectification and their nature as - normal or abnormal. The possible ways of treatment are as below:

1. When defectives are normal and it is not beneficial to try to identify them job wise, the following methods are generally used:
 - (a) Charged to good products: The cost of rectification of normal defectives is charged to good units. This method is used when defectives rectified are normal.
 - (b) Charged to general overheads: Where the department responsible for defective cannot be correctly identified, because defectives caused in one department are reflected only on further processing, the rework costs are charged to general overheads.
 - (c) Charged to departmental overheads: If the department responsible for defectives can be correctly identified, the rectification costs should be charged to that department.
 2. Where normal defectives are easily identifiable with specific jobs, the rework costs are debited to the jobs.
 3. When defectives are abnormal and are due to causes within the control of the organisation, the rework cost should be charged to the costing profit and loss account.
- (b) (i) Cost of R & D project undertaken on behalf of a specific customer should not be treated as manufacturing overhead. It should be regarded as a separate profit centre. All expenses to meet such costs should be debited to "Outside R & D Project Account". Receipts against such requests are to be credited against this account.
- (ii) Where research and development of products are undertaken on continuous basis the expenditure is treated as product costs. The cost of incomplete research project should be carried out continuously in order to retain company's place in the industry, the expenditure should be treated as general overhead. Some companies prefer to charge such costs of continuous research, to the Profit & Loss Account.
- (c) Reasons for disagreement of 'Profits as per Financial accounts and Cost accounts are as below. There are certain items which are included in Financial accounts but not in Cost Accounts. Likewise there are certain items which are in Cost Accounts but not in Financial accounts.

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Examples of financial charges which appear only in financial books are:

- (i) Loss on the sale of fixed assets and investments.
- (ii) Interest on bank loans, mortgage etc.
- (iii) Expenses relating to the issue and transfer of shares and debentures like stamps duty expenses; discount on shares and debentures etc.
- (iv) Penalties and fines.

Examples of incomes which are recorded in the financial books only are:

- (i) Profit on the sale of investments and fixed assets.
- (ii) Interest received on investments and bank deposits.
- (iii) Dividend received on investment in shares.
- (iv) Fees received on issue and transfer of shares etc.
- (v) Rental income.

There are abnormal or special items of expenditure and income which are not included in the cost of production. Their inclusion in cost of production, would result into incorrect cost ascertainment. Different bases of charging depreciation also accounts for the disagreement of profits as per financial and cost accounts. Different methods of valuation of closing stock adopted in cost and financial accounts will also account for the difference in profits under financial and cost accounts.