

	<i>Paperback</i>	<i>Hard Bound</i>
Revenue	Rs. 16,00,000	Rs. 14,00,000
Direct costs	Rs. 12,50,000	Rs. 6,00,000
Overhead	Rs. 4,25,000	75,000
Total Costs	Rs. 16,75,000	Rs. 6,75,000
Margin	Rs. (75,000)	Rs. 7,25,000

The reason paperbacks were erroneously thought to be unprofitable was caused by the method of allocating overhead. The firm should continue producing paperbacks as shown in the following calculations.

	<i>Paperback</i>	<i>Hard Bound</i>
Revenue	Rs. 16,00,000	Rs. 14,00,000
Direct costs	Rs. 12,50,000	Rs. 6,00,000
Overhead	Rs. 2,20,000	Rs. 2,80,000
Total costs	Rs. 14,70,000	Rs. 8,80,000
Margin	Rs. 1,30,000	Rs. 5,20,000

Example 8.5

FOAMSTAR LTD. makes three main products using broadly the same production method and equipment for each. A conventional product costing system is used at present although an ABC, system is being considered. Details of the three products for a typical period are:

	<i>Hours per Unit</i>		<i>Material per unit</i>	<i>Volume units</i>
	<i>Labour Hours</i>	<i>Machine Hours</i>		
Product P	0.50	1.50	20	750
Product Q	1.50	1.00	12	1250
Product R	1.00	3.00	25	7000

Direct labour costs Rs. 6 per hour and production overheads are absorbed on a machine hour basis. The rate for the period is Rs. 28 per machine hour.

Further analysis shows that the total of production overheads can be divided as follows:

	%
Cost relating to set ups	35
Cost relating to machinery	20
Cost relating to materials handling	15
Cost relating to inspection	30
Total production overhead	<u>100</u>

The following activity volumes are associated with the product line for the period as a whole. Total activities for the period:

	Number of set-ups	Number of movements of materials	Number of inspection
Product P	75	12	150
Product Q	115	21	180
Product R	480	87	670
	<u>670</u>	<u>120</u>	<u>1000</u>

Required:

- (i) Calculate the cost per unit for each product using conventional methods:
 - (ii) Calculate the cost per unit for each product using ABC principles:
 - (iii) Comment on the reasons for any differences in the costs in your answers to (i) and (ii):
- (I.C.W.A. Stage 2, June 2005)

Solution:

FOAMSTAR LTD.

(i) Statement showing product cost per unit (conventional Method):

	Product P	Product Q	Product R
Direct labour @ Rs. 6	3.00	9.00	6.00
Material	20.00	12.00	25.00
Production overhead @ Rs. 28	42.00	28.00	84.00
(Machine hours – 1.5, 1, 3)	65.00	49.00	115.00

(ii) ABC Principles – Total Production overhead based on Machine hours weightage
 $(750 \times 1.50 + 1250 \times 1 + 7000 \times 3) \text{ Rs. } 28 = \text{Rs. } 6,54,500$

	%	Rs.
Set up costs	35%	2,29,075
Machining	20%	1,30,900
Material handling	15%	98,175
Inspection	30%	1,96,350
		6,54,500

	Total	Product P	Product Q	Product R
	Rs.	Rs.	Rs.	Rs.
Set ups (75 : 115 : 480)	2,29,075	25,643	39,319	1,64,113
Machining (1125 : 1250 : 21000)	1,30,900	6,300	7,000	1,17,600
Materials handling (12 : 21 : 87)	98,175	9,817	17,181	71,177
Inspection (150 : 180 : 670)	1,96,350	29,452	35,343	1,31,555
	6,54,500	71,212	98,843	4,84,445
Number Units		750	1250	7000
Production overhead Per unit (rounded)		95	79	69

Product Cost per Unit—ABC Principles

	Product P	Product Q	Product R
	Rs.	Rs.	Rs.
Direct Labour	3.00	9.00	6.00
Materials	20.00	12.00	25.00
Production overhead	95.00	79.00	69.00
	118.00	100.00	100.00

(iii) Reasons for difference:

- Set up cost has been distributed based on number of set ups, it is more logical than conventional approach.
- Material handling cost is logically distributed based on number of movements of materials.
- Inspection cost is also based on inspection activity.

Hence, Product – *P* and Product – *Q* have received proportionally more production overhead under ABC principle than conventional product costing methods.

Working Notes:

Costs of machining have been split in proportion to the total machine hours per product.

Product – <i>P</i>	750 × 1.50	= Rs. 1,125
Product – <i>Q</i>	1250 × 1.00	= Rs. 1,250
Product – <i>R</i>	7000 × 3.00	= Rs. 21,000
		<u>Rs. 23,375</u>

Example 8.6

MST Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

Activity	Cost Driver	Capacity	Cost
Power	Kilowatt hours	50,000 kilowatt hours	Rs. 2,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	Rs. 3,00,000

The company makes three products *M*, *S* and *T*. For the year ended March 31, 2004, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
<i>M</i>	10,000	3,500
<i>S</i>	20,000	2,500
<i>T</i>	15,000	3,000

Required:

- Compute the costs allocated to each product from each activity.
 - Calculate the cost of unused capacity for each activity.
 - Discuss the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.
- (CA, PE, Exam II, Group II, May 2004)*

Solution:

(i) Statement of cost allocation to each product from each activity

	Product			Total Rs.
	<i>M</i> Rs.	<i>S</i> Rs.	<i>T</i> Rs.	
Power	40,000	80,000	60,000	1,80,000
(Refer to Working Note)	(10,000 kWh × Rs. 4)	(20,000 kWh × Rs. 4)	(15,000 kWh × Rs. 4)	
Quality Inspections	1,05,000	75,000	90,000	2,70,000
(Refer to Working Note)	(3,500 inspections × Rs. 30)	(2,500 inspections × Rs. 30)	(3,000 inspections × Rs. 30)	

Working Notes:**Rate per unit of cost driver:**

Power : (Rs. 2,00,000/50,000 kwh) = Rs. 4/kwh

Quality Inspection : (Rs. 3,00,000/10,000 inspections) = Rs. 30 per inspection

(ii) Computation of cost of unused capacity for each activity:

Power	Rs.
(Rs. 2,00,000 – Rs. 1,80,000)	20,000
Quality Inspections	
(Rs. 3,00,000 – Rs. 2,70,000)	<u>30,000</u>
Total cost of unused capacity	50,000

(iii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing and capacity management
- Effect on pricing decisions.
- Effect on performance evaluation
- Effect on financial statements
- Regulatory requirements.
- Difficulties in forecasting chosen capacity level concepts.

Example 8.7

Fasteners Ltd. produces and sells four products *A*, *B*, *C* and *D*. Details of the four products and relevant information are given below for week ended 28th April, 2007.

Product	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Output (units)	120	100	80	120
Cost per unit: (Rs.)				
Direct Material	40	50	30	60
Direct Labour	28	21	14	21
Machine-hours (per unit)	4	3	2	3

The four products are similar and are usually produced in production runs of 20 units and sold in batches of 10 units.

The production overheads during the period are as follows:

	Rs.
Factory works expenses	20,860
Set up costs	10,500
Stores receiving	7,200
Inspection/Quality control	4,200
Material handling and dispatch	9,240

The production overhead is currently absorbed by using a Machine-hour rate and the company wishes to introduce ABC system and has identified major cost pools for production overheads and their associated cost drivers.

Information in these activity cost pools and their drivers is given below:

<i>Activity Cost Pools</i>	<i>Cost Drivers</i>
Factory Works Expenses	Machine-hours
Set up Costs	Number of production runs
Stores receiving	Requisition raised
Inspection/Quality Control	Number of production runs
Material handling and dispatch	Number of orders executed

The number of requisitions raised on the stores was 20 for each product and number of orders executed was 42, each order being for a batch of 10 of a product.

Requirements:

- Total cost of each product assuming the absorption of overhead on Machine-hour basis.
- Total cost of each product assuming the absorption of overhead by using ABC.
- Show the differences between (i) and (ii) and comment. *(ICWA, Inter, Stage II, June 2007)*

Solution:

FASTENERS LIMITED

- (i) Statement showing Total Cost of different products assuming absorption of overhead on a Machine Hour Rate basis

(Figure in Rs.)

<i>Particulars</i>	<i>Products</i>				<i>Total</i>
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	
Output (units)	120	100	80	120	420
Direct Material	40	50	30	60	180
Direct Labour	28	21	14	21	84
Overheads @ Rs. 40 per MH	160	120	80	120	480
Total Cost per Unit	228	191	124	201	
Total Cost	27360	19100	9920	24120	80500

$$\text{Overhead Rate} = \frac{\text{Rs. } 52,000}{1300} = \text{Rs. } 40 \text{ per Machine hour}$$

$$[\text{Total Machine hours} = (120 \times 4 + 100 \times 3 + 80 \times 2 + 120 \times 3) = 1300]$$

(ii)

<i>Total Overheads</i>	<i>(Rs.)</i>	<i>Drivers</i>	<i>No.</i>	<i>Cost/Unit of Drivers</i>	
Factory Works Expenses	20860	Machine hrs	1300	20860 ÷ 1300	= Rs. 16.05
Set up Costs	10500	Production runs	21	10500 ÷ 21	= 500.00
Stores receiving	7200	Requisitions	80	7200 ÷ 80	= 90.00
Inspection/Quality Control	4200	Production runs	21	4200 ÷ 21	= 200.00
Material Handling and Despatch	9240	Orders	42	9240 ÷ 42	= 220.00
Total	52000				

Statement Showing Total Cost of each product assuming Activity Based Costing:

Particulars	Product			
	A	B	C	D
Output (units)	120	100	80	120
No. of Production runs	6	5	4	6
No. of stores requisitions	20	20	20	20
No. of Sales Orders	12	10	8	12
Machine hours	4	3	2	3
Direct material (Rs.)	40.00	50.00	30.00	60.00
Direct labour (Rs.)	28.00	21.00	14.00	21.00
Factory Works Expenses (Rs.)	64.18	48.14	32.09	48.14
Set ups (Rs.)	25.00	25.00	25.00	25.00
Store receiving (Rs.)	15.00	18.00	22.50	15.00
Inspection/Quality Control (Rs.)	10.00	10.00	10.00	10.00
Handling/dispatch (Rs.)	22.00	22.00	22.00	22.00
Unit Cost (Rs.)	204.18	194.14	155.59	201.14
Total cost (Rs.)	24501.60	19414.00	12447.20	24136.80

(iii) Statement Showing differences (in Rs.)

Particulars	Product			
	A	B	C	D
Cost per Unit Under MHR (i)	228.00	191.00	124.00	201.00
Cost per Unit Under ABC (ii)	204.18	194.14	155.59	201.14
Difference	23.82	(3.14)	(31.59)	(0.14)
Total Cost-MHR (i)	27360.00	19100.00	9920.00	24120.00
Total Cost-ABC (ii)	24501.60	19414.00	12447.20	24136.80
Difference	2858.40	(314.00)	(2527.20)	(16.80)

The use of activity based Costing gives different product Costs than what were arrived at by utilising traditional Costing. It can be argued that product Costs using ABC are more precise as overheads have been identified with specific activities.

THEORY QUESTIONS

1. What is Activity-Based Costing? Why is it needed?
2. What is a cost driver? What is the role of cost driver in tracing costs to products?
3. Explain the steps in applying Activity-Based Costing (ABC) in a manufacturing Company.
4. How are activities grouped in a manufacturing company?
5. Distinguish between activity-based costing and traditional costing system.
6. What are the benefits of activity-based costing?
7. Define unit level activities, batch level activities, product level activities and facility level activities.
8. "Overhead costs are source of product cost distortion." Do you agree, Explain.
9. Explain the concept of Activity-Based Costing and Cost Drivers.

10. Explain briefly each of the following categories in Activity-Based Costing (ABC) by giving at least two examples:
- Unit level activities
 - Batch level activities
 - Product level activities
 - Facility level activities

(CA, PE, Exam II, Group II, May 2007)

11. Discuss the different stages in Activity-Based Costing.

(CA, PE, Exam II, Group II, Nov. 2003)

12. Distinguish between target costing and Kaizen costing.

13. What is life cycle costing?

14. Write short notes on:

- Target costing
- Kaizen costing

15. Define Activity-Based management (ABM). What is its importance?

16. Distinguish between Activity-Based Costing (ABC) and Activity-Based Management (ABM).

SELF-EVALUATION QUESTIONS

Mr. Ashok Kumar owns a large department store in Delhi. For 10 years, the accountant has applied overheads to the various departments—produce, meat, dairy, canned foods, bakery and floral—based on the basis of employee hours worked. Mr. Ashok Kumar's son who is a commerce student in University of Delhi has suggested his father should consider activity-based costing (ABC): In an attempt to implement ABC, Mr. Ashok Kumar and his son have identified the following activities. They need your help in determining a cost driver for each of the activities.

Cost pool

- Placing orders
- Checking out customers
- Bagging groceries
- Delivering groceries
- Stocking shelves
- Janitorial and Maintenance
- Training employees
- Administrative
- Advertising and Marketing
- Accounting and legal service.

Ans: Cost drivers are

- Number of orders
- Number of customers, sales volume.
- Number of customers, sales volume
- Number of delivery orders
- Hours worked stocking
- Square feet occupied
- Total number of employees, number of new employees
- Sales volume
- Number of advertisement campaigns
- Sales volume.

PROBLEMS

1. ABC Company produces two types of stereo units. Activity data follows:

<i>Activity Usage Measures</i>	<i>Product-Costing Data</i>		
	<i>Deluxe</i>	<i>Regular</i>	<i>Total</i>
Units produced per year	5,000	50,000	55,000
Prime costs (Rs.)	39,000	369,000	408,000
Direct labour hours	5,000	45,000	50,000
Machine hours	10,000	90,000	100,000
Production runs	10	5	15
Number of moves	120	60	180

Activity Cost Data (overhead activities)

<i>Activity</i>	<i>Activity Cost (Rs.)</i>
Setting up equipment	60,000
Material handling	30,000
Using power	50,000
Testing	40,000
Total	180,000

Required:

- (i) Calculate the consumption ratios for each activity.
- (ii) Group activities based on the consumption ratios and activity level.
- (iii) Calculate a rate for each pooled group of activities.
- (iv) Using the pool rates, calculate unit product costs.

Ans:

(i) <i>Consumption ratios</i>	<i>Deluxe</i>	<i>Regular</i>
Set ups	0.67	0.33
Material handling	0.67	0.33
Power	0.10	0.90
Testing	0.10	0.90
(ii) Batch level: set ups and material handling		
Unit level: Power and testing		
(iii) Batch level pool Rs. 6000 per run		
Unit level Re. 0.90 per machine hour		
(iv) Unit costs: ABC		
Deluxe Rs. 21.60		
Regular Rs. 9.60		

2. ABC company has been incurring two types of overhead costs-material handling and quality inspection. The costs expected for these categories for the coming year are as follows:

Material handling	Rs. 10,00,000
Quality inspection	Rs. 30,00,000

The company currently charges overhead using direct labour hours and expected actual capacity. This figure is 50,000 direct labour hours.

The factory manager has been asked to submit a bid and has assembled the following data concerning proposed job.

	<i>Job</i>
Direct materials	Rs. 37,000
Direct labour (1000 hours)	Rs. 70,000
Number of material moves	10
Number of inspections	5

The manager has been informed that many competitors use an ABC approach to assign overhead to jobs. Before, submitting his bid for the proposed job, he wants to assess the effects of this alternative approach. He estimates that the expected number of material moves for all jobs during the year is 1,000. He also expects 5000 quality inspections to be performed.

Required:

- Compute the total cost of the proposed job using direct labour hours to assign overhead. Assume the bid price is full manufacturing cost plus 25%, what would be the manager's bid?
- Compute the total cost of the job using the number of material moves to allocate material-handling costs and the number of inspections to allocate the quality inspections costs. Assume bid price is full manufacturing costs plus 25%. What should be his bid using this approach?
- Which approach do you think best reflects the actual cost of the job. Explain.

Ans: (a) Bid price Rs. 2,33,750
 (b) Bid price Rs. 1,50,000
 (c) ABC best reflects the actual cost of the proposed job.

3. Assume that firm makes four products *A, B, C* and *D*. Data for the past period are as follows:

<i>Product</i>	<i>Output units</i>	<i>No. of production runs in period</i>	<i>Direct labour hrs per unit</i>	<i>Machine hours per unit</i>	<i>Material cost per unit (Rs.)</i>	<i>Material components per unit</i>
<i>A</i>	25	3	2	2	30	8
<i>B</i>	25	4	4	4	75	5
<i>C</i>	250	7	2	2	30	8
<i>D</i>	250	10	4	4	75	6
		24				

Direct labour costs Rs. 7 per hour:

Overhead costs	(Rs.)
Short-run variable costs	8,250
Long-run variable costs:	
Scheduling costs	7,680
Set-up costs	3,600
Material handling costs	7,650
	<u>27,180</u>

Find the unit production cost

- Using conventional product costing using a labour hour or machine hour overhead absorption rate.
- Using ABC with the following cost drivers:

Short-term variable costs:	Machine hours
Scheduling costs:	No. of production runs
Set-up costs:	No. of production runs
Materials handling costs:	No. of components

- Compare the results from the two methods.

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Ans:

	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
(a) Cost per unit (Rs.)	77	169	77	169
(b) Cost per unit (ABC)	126.4	208.2	83.16	153.8

(c) ABC charges more overheads to lower volume production and tends to charge relatively less to higher volume production, especially *D* in this case.

4. *MNP Suits* is a ready-to-wear suit manufacturer. It has four customers: two wholesale-channel customers and two retail-channel customers.

MNP Suits has developed the following activity-based costing system:

<i>Activity</i>	<i>Cost driver</i>	<i>Rate in 2004</i>
Order processing	Number of purchase orders	Rs. 1,225 per order
Sales visits	Number of customer visits	Rs. 7,150 per visit
Delivery-regular	Number of regular deliveries	Rs. 1,500 per delivery
Delivery-rushed	Number of rushed deliveries	Rs. 4,250 per delivery

List selling price per suit is Rs. 1000 and average cost per suit is Rs. 550. The CEO of *MNP Suits* wants to evaluate the profitability of each of the four customers in 2003 to explore opportunities for increasing profitability of his company in 2004. The following data are available for 2003:

<i>Item</i>	<i>Wholesale customers</i>		<i>Retail customers</i>	
	<i>W</i>	<i>H</i>	<i>R</i>	<i>T</i>
Total number of orders	44	62	212	250
Total number of sales visits	8	12	22	20
Regular deliveries	41	48	166	190
Rush deliveries	3	14	46	60
Average number of suits per order	400	200	30	25
Average selling price per suit	Rs. 700	Rs. 800	Rs. 850	Rs. 900

Required:

- Calculate the customer-level operating income in 2003.
- What do you recommend to CEO of *MNP suits* to do to increase the company's operating income in 2004?
- Assume *MNP Suits*' distribution channel costs are Rs. 17,50,000 for its wholesale customers and Rs. 10,50,000 for the retail customers. Also, assume that its corporate sustaining costs are Rs. 12,50,000. Prepare Income statement of *MNP Suits* for 2003.

(CA, PE, Exam II, Group II, Nov. 2004)

Ans:

	<i>W</i>	<i>H</i>	<i>R</i>	<i>T</i>
(a) Customer level operating income	24,54,650	28,06,750	10,46,500	11,98,250
(b) Reduce level of price discounting, especially by <i>W</i> , Reduce level of customer level costs, especially by <i>R</i> and <i>T</i> .				
(c) Total operating income	Rs. 34,56,150			

5. *Statusline and Company* is a manufacturer of a range of white Goods. Cost structure of its different products is as follows:

Standard Cost of the Products

<i>Particular</i>	<i>Product P</i>	<i>Product Q</i>	<i>Product R</i>
Direct Materials	25.00	20.00	20.00
Direct Labour @ Rs. 5 per hour	15.00	20.00	25.00
Production Overheads	15.00	20.00	25.00
	55.00	60.00	70.00
Quantity produced (units)	10,000	20,000	30,000

Production overhead is absorbed on the basis of Direct Labour Hours. Statusline and Company wishes to introduce Activity Based Costing (ABC) system and has identified four major cost pools for production overhead and their associated cost drivers. Information on these activity cost pools and their drivers is given below:

<i>Activity cost pool</i>	<i>Cost Driver</i>	<i>Cost Associated with Activity cost pool (Rs.)</i>
Stores Receiving	Purchase requisition	1,48,000
Inspection/Quality control	Number of production runs	4,47,000
Material handling and dispatch	Orders executed	1,05,000
Production scheduling/Machine set-ups	Number of set-ups	6,00,000

Further relevant information on the three products is also given below:

<i>Particular</i>	<i>Product P</i>	<i>Product Q</i>	<i>Product R</i>
No. of Purchase requisitions	300	450	500
No. of Production runs	750	1050	1200
No. of Orders executed	180	270	300
No. of set-ups	360	390	450

Required:

- (i) Calculate the activity based production cost of all the three products.
- (ii) Comment of the differences between the original traditionally Calculated Costs and Activity Based Costs (ABC) you calculated.

(ICWA, Stage 2, Dec. 2003)

Ans:

	<i>Products</i>		
	<i>P</i>	<i>Q</i>	<i>R</i>
(i) Total production costs (ABC)	Rs. 75.25	62.12	61.83
(ii) Product R is significantly overcosted in traditional system than in ABC while P is greatly under costed. Product R is a high volume product with a high direct labour content, while P is a low-volume product with a low direct labour content.			

COSTING METHODS AND ACCOUNTING OF COSTS

Different industries need to follow a method of product costing for determining unit cost and total cost. Part 3 is devoted to discussion of product costing methods—Job Costing and Process Costing and their variants. Cost accounting system and its reconciliation with financial accounting has also been covered in this part.

9. SINGLE OR OUTPUT COSTING
10. JOB, CONTRACT AND BATCH COSTING
11. PROCESS COSTING
12. SERVICE COSTING
13. COST CONTROL ACCOUNTS
14. INTEGRATED ACCOUNTING SYSTEM
15. RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

SINGLE OR OUTPUT COSTING

Learning Objectives:

After reading this chapter, you should be able to:

1. explain nature of single or output costing;
2. describe nature of production statement;
3. understand operation costing; and
4. explain the nature of estimated cost sheet.

NATURE

The term “single or output costing” is applied where a single product or only a few grades of similar articles are manufactured, for example, paper, cement, brick, coal, wine, etc. The total cost per unit is obtained by dividing the total cost of production by the number of units manufactured. The total cost of the product is determined in a cost sheet format (as discussed in Chapter 2). Since only one product is usually produced involving a single process, all costs are directly charged to that product. There is no problem of apportionment as to the products. Where several grades of the product are manufactured, it may be necessary to apportion the overhead costs relating to more than one variety of the product.

PRODUCTION STATEMENT

The production or output statement shows sales, stocks, and profit besides the cost in a statement format. The difference between a cost sheet and production statement is that a cost sheet merely records the costs incurred during the period, whereas a production statement records sales, stocks, and profit in addition to the costs incurred. Figure 9.1 gives the specimen of a production account.

OPERATION COSTING

Operation costing is a costing method which determines the unit product cost by each operation constituting the production process. It is different from process costing in the sense that each operation is considered as

separate cost centre and unit product cost is determined for each operation and not for each process as in process costing. All costs of direct material, direct labour, direct expenses, are collected for each operation through direct measurement, and overhead is apportioned equitably among different operations.

Operation costing is generally used in those industries where repetitive manufacturing is done, that is, where production includes large production runs or batches of common processes and/or materials.

Production Account			Output		
Particulars	Amount		Particulars	Amount	
	Rs.	P		Rs.	P
To direct material			By prime cost c/d		
To direct labour					
To direct expenses					
	_____			_____	
To prime cost b/d			By factory cost c/d		
To factory overheads					
	_____			_____	
To factory cost b/d			By cost of production c/d		
To office and administrative overheads					
	_____			_____	
To opening stock of finished goods			By closing stock of finished goods		
To cost of production b/d			By cost of goods sold c/d		
	_____			_____	
To cost of goods sold b/d			By sales		
To selling and distribution exp.					
To profit					
	_____			_____	
	_____			_____	

Fig. 9.1 Specimen of a Production Account

ESTIMATED COST SHEET

An estimated cost sheet is prepared before the production is commenced. These estimated costs are subsequently compared with actual costs so that costs can be controlled and be kept within prescribed limits. Besides, the estimated costs can be used by management for fixing selling prices and taking decisions regarding profit planning, production, administration and marketing. Estimation of costs is done on the basis of current situations and future circumstances are likely to have impact on different elements of costs. Estimated costs are always needed for submitting tenders or quotations for a specific order. The price to be quoted in a tender includes a reasonable percentage of profit. Care should be exercised while quoting price of a tender because the tender quoting the lowest price is accepted by the customer.

The treatment of stock of raw material, work-in-progress and finished goods is the same as explained in Chapter 2 while discussing preparation of Cost Sheet (Statement).

Example 9.1

In respect of a factory, the following particulars have been extracted for the year 2005:

	Rs.
Cost of Materials	6,00,000
Wages	5,00,000
Factory overheads	3,00,000
Administrative charges	3,36,000
Selling charges	2,24,000
Distribution charges	1,40,000
Profit	4,20,000

A work order has to be executed in 2006 and the estimated expenses are: Materials Rs. 8,000, Wages Rs. 5,000.

Assuming that in 2006 the rate of factory overheads has gone up by 20%, distribution charges have gone down by 10% and selling and administration charges have gone each up by 15%, at what price should the product be sold so as to earn the same rate of profit on the selling price as in 2005.

Factory overheads are based on Wages and Administration, selling and distribution overheads on factory cost.

(B.Com, Delhi, 2007)

Solution:

Statement for Cost for the Year 2005		Rs.
Cost of Material		6,00,000
Direct Labour		5,00,000
	PRIME COST	<u>11,00,000</u>
<i>Add:</i> Factory Overhead		3,00,000
	FACTORY COST	<u>14,00,000</u>
<i>Add:</i> Administrative Overhead		3,36,000
	COST OF PRODUCTION	<u>17,36,000</u>
<i>Add:</i> Selling Overhead		2,24,000
Distribution Charges		1,40,000
	COST OF SALES	<u>21,00,000</u>
	PROFIT	4,20,000
	SALES	<u>25,20,000</u>
Factory overhead as % of Direct Labour		60%
Administration overhead as % of Factory Cost		24%
Selling overhead as % of Factory Cost		16%
Distribution charges as % of Factory Cost		10%
Profit as a % of cost		20%

(Contd.)

Statement of Cost for work order		Rs.
Material		8,000
Wages		5,000
	PRIME COST	<u>13,000</u>
<i>Add:</i> Factory overhead (gone up by 20%) (60% of wages + 20% thereof) that is, 72% of wages		3,600
	FACTORY COST	<u>16,600</u>
<i>Add:</i> Administration charges (gone up by 15%) (24% of Factory cost + 15% thereof) that is, 27.6% of Factory cost		4581.60
	COST OF PRODUCTION	<u>21,181.60</u>
<i>Add:</i> Selling charges (gone up by 15%) (16% of Factory overhead + 15% thereof) that is, 18.4 of factory cost		3,054.40
Distribution charges (gone down by 10%) (10% of factory cost – 10% thereof) that is, 9% of factory cost		1494
	COST OF SALES	<u>25,730</u>
<i>Add:</i> Profit (20% of cost)		5,146
Selling Price		<u>30,876</u>

Example 9.2

A company presently sells an equipment for Rs. 35,000. Increase in prices of labour and material cost are anticipated to the extent of 15% and 10% respectively, in the coming year. Material cost represent 40% of cost of sales and labour cost 30% of cost of sales. The remaining relate to overheads. If the existing selling price is retained, despite the increase in labour and material prices, the company would face a 20% decrease in the existing amount of profit on the equipment.

You are required to arrive at a selling price so as to give the same percentage of profit on increased cost of sales, as before. Prepare a statement of profit/loss per unit, showing the new selling price and cost per unit in support of your answer. (ICWA Inter, Dec. 1996)

Solution:

Selling Price = Rs. 35,000

Let us assume present total cost of sales as x .

Particulars	Present condition	Anticipated condition
Direct Material	0.4x	0.46x
Labour	0.3x	0.33x
Overhead	0.3x	0.30x
	<u>x</u>	<u>1.09x</u>

Profit Rs. 35,000 – x

Rs. 35,000 – 1.09x

From the above the following equation can be made:

$$(35,000 - x) - (35,000 - 1.09x) = 20\% \text{ of } (35,000 - x)$$

or $-x + 1.09x = 7,000 - .2x$

or $.29x = 7,000$
 or $x = \text{Rs. } 24,137$

Hence the present total cost of sales is Rs. 24,137.

Statement of Profit (Loss)

<i>Particulars</i>	<i>Present Rs.</i>	<i>Anticipated Rs.</i>
<i>Material:</i>		
Present $24,137 \times .4$	9,654.80	
Anticipated $24,137 \times .46$		11,103.02
<i>Labour:</i>		
Present $24,137 \times .3$	7,241.1	
Anticipated $24,137 \times .33$		7,965.21
<i>Overheads</i> $24,137 \times .3$	7,241.1	7,241.10
Total Cost of Sales	24,137.0	26,309.33
Profit (45% of cost of sales)	10,863.0	11,839.20
Selling Price	35,000.0	38,148.53

For the present condition, total cost is Rs. 24,137 and sales (as given) is Rs. 35,000. Therefore, profit (balancing figure) would be Rs. 10,863 (Rs. 35,000 – 24,137). This profit of Rs. 10,863 amounts to 45% of cost of sales. Applying 45% for the anticipated condition, the profit comes to Rs. 11,839.20.

Hence, new selling price of the equipment should be (say) Rs. 38,150.

Example 9.3

The following balances have been obtained from the books of Rivatex Limited for the year ending December 31, 2002.

Stock on 1st January, 2002 :	Rs ('000)
Manufactured goods	974
Raw materials	300
Depreciation of plant	1,300
Discount allowed	374
Printing and stationery	93
Purchases:	
Manufactured goods	1,274
Raw materials	8,726
Repairs to plant	250
Office rent and rates	650
Coal	579
Carriage inwards	391
Office salaries	940
Carriage outwards	233
General expenses	317
Factory rent and rates	2,271
Manufacturing wages and salaries	11,029
Travelling expenses	279
Sales	29,942
Stocks on 31st December, 2002	
Manufactured goods	2,794
Raw materials	200

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Goods manufactured are to be debited to the sales department at current market prices, namely, Rs. 2,71,50,000.

You are required to prepare accounts in such a form as to disclose; (i) Cost of raw materials consumed, (ii) Prime cost, (iii) Factory cost, (iv) Gross profit on manufacture, (v) Cost of manufactured goods, (vi) Gross profit on sales, and (vii) Net profit that may be considered rational from the accounting point of view.

(B. Com. (Hons), Delhi)

Solution:

Production Account

	(Rs '000)		(Rs '000)
To Opening stock of raw materials	300	By Closing stock of raw materials	200
To Purchases of raw materials	8,726	By Cost of raw materials consumed	9,217
To Carriage inwards	391		
	<u>9,417</u>		<u>9,417</u>
To Cost of raw materials consumed	9,217	By prime cost c/d	20,246
To Manufacturing wages and salaries	11,029		
	<u>20,246</u>		<u>20,246</u>
To Prime cost b/d	20,246	By Factory cost c/d	24,646
To Factory overheads:			
Depreciation on plant	1,300		
Repairs to plant	250		
Coal	579		
Factory rent and rates	2,271		
	<u>24,646</u>		<u>24,646</u>
To Factory cost b/d	24,646	By Sales value	27,150
To Office overheads:			
Printing and stationery	93		
Office rent and rates	650		
Office salaries	940		
General expenses	317		
	<u>2,020</u>		
Cost of production	26,646		
To Gross profit on manufacture	504		
	<u>27,150</u>		<u>27,150</u>
To Opening stock of good manufactured	974	By Closing stock of mfd. goods	2,794
To Goods transferred from mfg. deptt.	27,150	By Cost of goods mfd.	25,330
	<u>28,124</u>		<u>28,124</u>
To Cost of goods mfd.	25,330	By Sales	29,942
To Purchase of manufactured goods	1,274		
To Gross Profit	3,338		
	<u>29,942</u>		<u>29,942</u>
To Selling and Distribution:		By Gross profit	3,338
Travelling expenses	279		
Discount allowed	374		
Carriage outward	233		
	<u>886</u>		
To Net Profit	2,452		
	<u>3,338</u>		<u>3,338</u>

(Contd.)

General Profit and Loss Account

	(Rs. '000)		(Rs '000)
To Stock reserve		By Gross profit on manufacture	504
(for unrealised profit on increase in stock of Rs. 1,820)	34	By Net profit	2,452
To Net Profit	2,922		
	<u>2,956</u>		<u>2,956</u>

Notes:

1. It has been presumed that:

- (i) Stock of manufactured goods consist of only those goods which have been manufactured in the factory and they are at current market price.
- (ii) Office overheads have been incurred only in respect of goods manufactured in the factory.
- (iii) Selling overheads have been incurred for sale of both the types of goods, that is, those manufactured in the factory as well as those purchased from outside.

2. Stock Reserve has been calculated as follows:

$$\frac{504}{27,150} \times 1,820 = 33.78 \text{ or Rs. } 34.$$

Example 9.4

A factory can produce 60,000 units per annum at its optimum (100%) capacity.

The estimated costs of production are as under:

Direct material	Rs. 3 per unit
Direct labour	Rs. 2 per unit
Indirect expenses:	
Fixed	Rs. 1,50,000 per annum
Variable	Rs. 5 per unit
Semi-variable	Rs. 50,000 per annum up to 50% capacity and an extra expense of Rs. 10,000 for every 25% increase in capacity or part thereof.

The factory produces only against orders (and not for own stock).

If the production programme of the factory is as indicated below and the management desires to ensure a profit of Rs. 1,00,000 for the year, work out the average selling price at which each unit should be quoted:

First 3 months of the year: 50% of capacity; remaining 9 months 80% of capacity.

Ignore selling, distribution and administration overheads.

(ICWA Inter, B. Com. (Hons), Delhi)

Solution:

Statement of Cost

	First 3 months 7,500 units	Remaining 9 months 36,000 units	Total 43,500 units
Direct material @ Rs. 3 per unit	Rs. 22,500	Rs. 1,08,000	Rs. 1,30,500
Direct labour @ Rs. 2 per unit	Rs. 15,000	Rs. 72,000	Rs. 87,000
Prime cost	<u>37,500</u>	<u>1,80,000</u>	<u>2,17,500</u>

(Contd.)

Statement of Cost

	First 3 months 7,500 units	Remaining 9 months 36,000 units	Total 43,500 units
<i>Add:</i> Indirect expenses:			
Fixed (1:3)	37,500	1,12,500	1,50,000
Variable @ Rs. 5 per unit	37,500	1,80,000	2,17,500
Semi-variable			
for first 3 months @ Rs. 50,000 per annum	12,500		
For remaining 9 months @ Rs. 70,000 per annum		52,500	65,000
Total Cost	1,25,000	5,25,000	6,50,000
Profit	—	—	1,00,000
Sales	—	—	7,50,000

Example 9.5

The following budgeted cost information is available from the records of a manufacturing concern:

	(Rs Lakhs)	
		61.20
Direct Materials		
Direct Wages:		
Rolling shop (1,20,000 hours)	6.00	
Milling shop (2,40,000 hours)	14.40	20.40
Work Overheads (Allocation on Labour Hours):		
Rolling shop	9.60	
Milling shop	28.80	38.40
Administrative Overheads		24.00
Selling Overheads		28.80
Distribution Overheads		14.40

The concern follows absorption method of costing. On the basis of above data, prepare a schedule of Overhead Rates. The Sales Division of the concern requires a Cost Estimate for a product for which following information are available:

- Direct Material : Material X 120 kg @ Rs. 30 per kg
 Material Y 72 kg @ Rs. 55 per kg
- Direct Labour : Rolling shop 40 hours @ Rs. 6 per hour.
 Milling shop 70 hours @ Rs. 5 per hour.

You are required to work out the Cost Estimate showing cost per unit using the above information and the overhead rates so computed.

(ICWA Inter)

Solution:**Schedule of Predetermined Overhead Recovery Rates for the Year**

Type of overhead	Shop	Basis	Computation	Recovery rate
1. Work overhead	Rolling	Rolling Labour hrs	$\frac{\text{Budgeted overheads}}{\text{Budgeted labour hrs}}$ $\frac{\text{Rs. 9,60,000}}{1,20,000 \text{ hrs}}$	Rs. 8 per rolling labour hr.
	Milling	Milling Labour hrs	$\frac{\text{Budgeted overheads}}{\text{Budgeted labour hours}}$ $\frac{28,80,000}{2,40,000 \text{ hrs}}$	Rs. 12 per milling labour hr.
2. Administrative overheads		Percentage on works cost	$\frac{\text{Budgeted admn. overheads}}{\text{Budgeted works cost}} \times 100$ $\frac{\text{Rs. 24 lakhs}}{\text{Rs. 120 lakhs}} \times 100$	20% on works cost
3. Selling Overheads		Percentage on cost of production	$\frac{\text{Budgeted Selling Cost}}{\text{Budgeted Production cost}} \times 100$ $\frac{\text{Rs. 28.80 lakhs}}{\text{Rs. 144 lakhs}} \times 100$	20% on cost of
4. Distribution		Percentage on cost of production	$\frac{\text{Rs. 14.40 lakhs}}{\text{Rs. 144 lakhs}} \times 100$	10% of production cost

Job Cost Estimate

Elements of Cost	Computation			Amount (Rs.)
Direct Materials	Material X:	120 kg	@ Rs. 30 =	Rs. 3,600
	Y:	72 kg	@ Rs. 55 =	Rs. 3,960
Direct Labour	Rolling shop:	40 hrs	@ Rs. 6 =	Rs. 240
	Milling shop:	70 hrs	@ Rs. 5 =	Rs. 350
		Prime Cost		<u>8,150.00</u>
Works Overhead	Rolling shop:	40 hrs	@ Rs. 8 =	Rs. 320
	Milling shop:	70 hrs	@ Rs. 12 =	Rs. 840
		Works Cost		<u>9,310.00</u>
Admn. Overheads 20% on Works Cost (that is, Rs. 9,310)				<u>1,862.00</u>
		Cost of Production		<u>11,172.00</u>
Selling Overheads 20% on Cost of Production (that is, Rs. 11,172)				<u>2,234.40</u>
Distribution 10% on Cost of Production (that is, Rs. 11,172)				<u>1,117.20</u>
		Total Cost		<u>14,523.60</u>

Example 9.6

The expenses of a machine cost centre for a particular month are as follows:

- (i) Power Rs. 50,000
- (ii) Maintenance and Repairs: Rs. 10,000
- (iii) Machine Operator's Wages: Rs. 2,000
- (iv) Supervision: Rs. 6,000
- (v) Depreciation: Rs. 40,000

Other particulars are given below:

Products	Rate of production	Production in units
A	30 Units per hour	1,800
B	10 Units per hour	500
C	6 Units per hour	300
D	4 Units per hour	260

The entire production was to be offered to Government on 'cost Plus 20%' basis. Material costs per units are: A: Rs. 40; B: Rs. 60; C: Rs. 100 and D: Rs. 300.

Prepare a statement showing product-wise 'cost' and 'offer price'.

(ICWA Inter)

Solution:**Cost of Machine Centre**

	Rs.
Power	50,000
Maintenance and repairs	10,000
Machine operators wages	2,000
Supervision	6,000
Depreciation	40,000
	<u>1,08,000</u>

Statement Showing Product-wise Cost

Product	Output		Equivalent machine hours	Machine centre cost		Cost per unit	Material cost per unit	Total cost per unit
	Total	Per hour		Per hr.	Total allocation			
A	1,800	30	60		28,800	16	40	56
B	500	10	50		24,000	48	60	108
C	300	6	50		24,000	80	100	180
D	260	4	65		31,200	120	300	420
					<u>4.80* 1,08,000</u>			

*1,08,000 ÷ 225 = Rs. 4.80 per hour

Note:

Rs. 10,80,000 has been allocated in the ratio of machine hours (60 : 50 : 50 : 65).

Statement of 'Offer Price'

Product	Cost per unit	Profit per unit (@ 20% of cost)	Office price per unit
	Rs.	Rs.	Rs.
A	56	11.20	67.20
B	108	21.60	129.60
C	180	36.00	216.00
D	420	84.00	504.00

Example 9.7

An article passes through three successive operations from the raw materials stage to the finished product stage. The following data are available from the production records of a particular month:

Operation No.	No. of Pcs. input	No. of Pcs. rejected	No. of Pcs. output
1	60,000	20,000	40,000
2	66,000	6,000	60,000
3	48,000	8,000	40,000

- Determine the input required to be introduced in the first operation in number of pieces in order to obtain finished output of 100 pieces after the last operation.
- Calculate the cost of raw material required to produce one piece of finished product, given the following information:

Weight of the finished piece is 0.10 kg and the price of raw material is Rs. 20 per kg. (CA Inter)

Solution:**(i) Statement of Production (for a Month)**

Operation No.	Input, Total No.	Rejections		Output, Total No.
		Total No.	% Rejection to output	
1	60,000	20,000	50%	40,000
2	66,000	6,000	10%	60,000
3	48,000	8,000	20%	40,000

Input required for final output of 100 units:

	<i>No. of Pcs.</i>
Output of process 3	100
Loss in process No. 3 20%	<u>20</u>
Input to process 3 or output of process 2	120
Loss in process 2, 10%	<u>12</u>
Input to process 2 or output of process, 1	132
Loss in process 1, 50%	<u>66</u>
Input to process 1	198

- (ii) To produce 100 piece of final output 198 pieces of initial input are used. The weight of one piece of finished output is 0.10 kg. Thus, the weight of input to produce one piece of output is 0.198 kg. The rate being Rs. 20, the cost of materials for producing one piece is Rs. 3.96.

Example 9.8

RST Ltd. manufactures plastic moulded chairs. Three models of moulded chairs, all variation of the same design are Standard, Deluxe and Executive. The company uses an operation-costing system.

RST Ltd. has extrusion, form, trim and finish operations. Plastic sheets are produced by the extrusion operation. During the forming operation, the plastic sheets are moulded into chair seats and the legs are added. The standard model is sold after this operation. During the trim operation, the arms are added to the Deluxe and Executive models and the chair edges are smoothed. Only the executive model enters the finish operation, in which padding is added. All of the units produced receive the same steps within each operation. In April, 2003 units of production and direct material cost incurred are as follows:

	<i>Units Produced</i>	<i>Extrusion Materials (Rs.)</i>	<i>Form Materials (Rs.)</i>	<i>Trim Materials (Rs.)</i>	<i>Finish Materials (Rs.)</i>
Standard Model	10,500	1,26,000	42,000	0	0
Deluxe Model	5,250	63,000	21,000	15,750	0
Executive Model	3,500	42,000	14,000	10,500	21,000
	19,250	2,31,000	77,000	26,250	21,000

The total conversion costs for the month of April, 2003 are:

	<i>Extrusion Operation</i>	<i>Form Operation</i>	<i>Trim Operations</i>	<i>Finish Operation</i>
Total conversion costs	Rs. 6,06,375	Rs. 2,97,000	Rs. 1,55,250	Rs. 94,500

Required:

- (i) For each product produced by RST Ltd. during April, 2003, the determine the unit cost and the total cost
- (ii) Now consider the following information for May. All unit costs in May are identical to the April unit costs calculated as above in (i). At the end of May, 1,500 units of the Deluxe model remain in work-in-progress. These units are 100% complete as to materials and 65 % complete in the trim operation. Determine the cost of the Deluxe model work-in-process inventory at the end of May.

(CA, PE, Exam II, Group II, May 2003)

Solution:

Working Notes:

1. **Statement of Equivalent Production units of Extrusion, Form, Trim and Finish materials for Standard, Deluxe and Executive Model of Chairs**

	<i>Extrusion materials units</i>	<i>Form materials units</i>	<i>Trim materials units</i>	<i>Finish materials units</i>
Equivalent unit of materials required to produce three brands of plastic moulded chairs	19,250	19,250	8,750	3,500

2. Statement of Material and Conversion Cost per Equivalent Units

	<i>Extrusion</i>	<i>Form</i>	<i>Trim</i>	<i>Finish</i>
Equivalent units: (A) (Refer to Working Note 1)	19,250	19,250	8,750	3,500
Material cost (Rs.): (B)	2,31,000	77,000	26,250	21,000
Conversion costs of different operations performed on material (Rs.): (C)	6,06,375	2,97,000	1,55,250	94,500
Material cost per equivalent units (Rs.): (B/A)	12	4	3	6
Conversion cost per equivalent unit (Rs.): (C/A)	31.50	15.43	17.74	27

(I) Statement of Unit of Total cost Model-wise
(Refer to Working Notes 1 and 2)

	<i>Standard Model Cost</i>	<i>Deluxe Model Cost</i>	<i>Executive Model Cost</i>
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Extrusion material	12.00	12.00	12.00
Form material	4.00	4.00	4.00
Trim material	—	3.00	3.00
Finish material	—	—	6.00
Extrusion conversion	31.50	31.50	31.50
Form conversion	15.43	15.43	15.43
Trim conversion	—	17.74	17.74
Finish conversion	—	—	27
Total unit cost	62.93	83.67	116.67
Total Cost	6,60,765 (10,500 units × Rs. 62.93)	4,39,267.5 (5,250 units × Rs. 83.67)	4,08,345 (3,500 units × Rs. 116.67)

(II) Statement of cost of 1,500 units of the Deluxe Model of the chairs lying in Work-in-progress inventory at the end of May 2003

	<i>Equivalent units</i>	<i>Units cost (Refer to working note 2) Rs.</i>	<i>Total Cost</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3) = (1) × (2)</i>
Extrusion materials	1,500	12	18,000
Form materials	1,500	4	6,000
Trim materials	1,500	3	4,500
Extrusion materials conversion	1,500	31.50	47,250
Form materials conversion	1,500	15.43	23,145
Trim materials conversation (1,500 units × 65%)	975	17.74	17,296.50
Total cost of 1,500 units of Deluxe Model of chairs lying in WIP			1,16,191.50

THEORY QUESTIONS

1. Explain the nature of single costing.
2. Describe briefly the procedure of presenting costs under single costing. Explain giving an example.
3. Explain the nature of operation costing.

PROBLEMS

1. M/s Indu Industries Ltd. are the manufacturers of moonlight torches. The following data relate to manufacture of torches during the month of March 2007:

Raw material consumed	Rs. 20,000
Direct wages	Rs. 12,000
Machine-hour worked	9,500 hours
Machine-hour rate	Rs. 2
Office overheads	20% of works cost
Selling overheads	Re. 0.50 per unit
Units produced	20,000
Unit sold	18000 @ Rs. 5 per unit

Prepare Cost Sheet showing the cost and the profit per unit and the total profit earned.

Ans: Prime cost Rs. 32,000; Works cost Rs. 51,000; Cost of production Rs. 61,200;
Cost of production of goods sold Rs. 55,080; Cost of sales Rs. 64,080; Sales
90,000, Profit Rs. 25,920.

2. The following details have been obtained from the cost records of Comet Paints Limited:

Stock of raw materials on Sept. 1, 2007	Rs. 75,000
Stock of raw materials on Sept. 30, 2007	91,500
Direct wages	52,500
Indirect wages	2,750
Sales	2,11,000
Work-in-progress on Sept. 1, 2007	28,000
Work-in-progress on Sept. 30, 2007	35,000
Purchases of raw materials	66,000
Factory rent, rates and power	15,000
Depreciation of plant and machinery	3,500
Expenses on purchases	1,500
Carriage outwards	2,500
Advertising	3,500
Office rent and taxes	2,500
Travellers, wages and commission	6,500
Stock of finished goods on Sept. 1, 2007	54,000
Stock of finished good on Sept. 30, 2007	31,000

Prepare a production account giving the maximum possible break-up of costs and profit.

(B. Com. (Hons), Delhi)

Ans: Prime cost Rs. 1,03,500; Works cost Rs. 1,17,750; Cost of production Rs. 1,43,250;
Cost of sales Rs. 1,55,750; Profit Rs. 55,250.

3. The Managing Director of a small manufacturing concern consults you as to the minimum price at which he can sell the output of one of the departments of the company which is intended for mass production in future. The company's records show the following particulars for this department for the past year:

<i>Production and sales</i>	<i>100 units</i>
	Rs.
Materials	13,000
Direct labour	7,000
Direct charges	1,000
	Rs.
Works overheads	7,000
Office overheads	2,800
Selling overheads	3,200
Profit	5,000
	<u>39,000</u>

You ascertain that 40% of the works overheads fluctuate directly with production and 70% of the selling overheads fluctuate with sales. It is anticipated that the department would produce 500 units per annum and that direct labour charges per unit will be reduced by 20%, while fixed works overheads charges will increase by Rs. 3,000. Office overheads and fixed selling overheads charges are expected to show an increase of 25% but otherwise no changes are anticipated.

Ans: Prime cost Rs. 98,000; Factory cost Rs. 1,19,200; Total cost 1,35,100; Profit Rs. 19867.60.

4. The following is the summarised Trading and Profit and Loss A/c of K. Waterproof Manufactures, Ltd., for the year ending 31st march, 2007 in which year 800 waterproofs were sold by the said company.

Trading and Profit and Loss A/c

<i>To cost of materials</i>	<i>Rs. 32,000</i>	<i>By Sales</i>	<i>Rs. 1,60,000</i>
To Direct wages	48,000		
To Manufacturing charges	20,000		
To Gross profit c/d	60,000		
	<u>1,60,000</u>		<u>1,60,000</u>
To Office salaries	24,000	By Gross profit b/d	60,000
To Rent and taxes	4,000		
To Selling expenses	8,000		
To General expenses	12,000		
To Net profit	12,000		
	<u>60,000</u>		<u>60,000</u>

Following estimates were made by the costing department of the company for the year ending 31st March, 2008:

- (a) The output and the sales will be 1,000 waterproofs.
- (b) The price of materials will rise by 25% on the previous year's level.
- (c) Wages during the year will rise $12\frac{1}{2}\%$.
- (d) Manufacturing cost will rise in proportion to the combined cost of materials and wages.
- (e) Selling cost per unit will remain unchanged.
- (f) Other expenses will remain unaffected by the rise in output.

From the above information prepare a cost statement showing the price at which the waterproofs would be marketed so as to show a profit of 10% on the selling price.

Ans: Selling Price per waterproof Rs. 218.75 including 10% profit on sales or 1/9 profit on cost

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5. Baluja Shoe Company manufactures two types of shoes *A* and *B*. Production costs for the year ended 31st December 2008 were as follows:

Direct material	Rs. 15,00,000
Direct wages	8,40,000
Production overhead	3,60,000
	27,00,000

There was no work-in-progress at the beginning or at the end of the year. It is ascertained that:

- (i) The cost of direct materials in type *A* shoes is twice as much as that in type *B*.
- (ii) The direct wages for type *B* shoes were 60% of those of type *A* shoes.
- (iii) Production overhead was the same per pair of *A* and *B* type.
- (iv) Administrative overhead for each type was 150% of direct wages.
- (v) Selling cost was Rs. 1.50 per pair.
- (vi) Production during the year:

Type *A* 40,000 pairs of which 36,000 were sold.

Type *B* 1,20,000 pairs of which 1,00,000 were sold.

- (vii) Selling price was Rs. 44 for type *A* and Rs. 28 per pair for type *B*.

Prepare a statement showing cost and profit.

		<i>Cost</i>		<i>Profit</i>
<i>Ans:</i>	Type <i>A</i>	Rs. 13,50,000		Rs. 2,34,000
	Type <i>B</i>	Rs. 22,50,000		Rs. 5,50,000

6. Meera Industries Limited is a single product organisation having a manufacturing capacity of 6,000 units per week of 48 hours. The output data vis-à-vis different elements of cost for three consecutive weeks are as follows:

Unit produced	Direct material (Rs.)	Direct labour (Rs.)	Total factory overheads (variable and fixed) Rs.
2,400	4,800	6,000	37,200
2,800	5,600	7,000	38,400
3,600	7,200	9,000	40,800

As a cost accountant, you are asked by the company management to work out the selling price assuming an activity level of 4,000 units per week and a profit of 20% on selling price.

(ICWA, Inter Year?)

Ans: Selling price per unit Rs. 18.75

7. In a chocolate factory raw materials to the extent of 4,000 lbs. at Rs. 5 per lb. have been issued. Three types of confectionery are to be manufactured, consuming material in the proportion of 4 : 3 : 1 respectively. A wastage of 5% is allowed. The wages for three types are respectively, Rs. 6,000, Rs. 4,000 and Rs. 1,800. Factory overhead is taken to be 70% of wages and office overhead 20% of works cost. Prepare a chart to show the total cost per lb. of each type of confectionery.

Ans.

	<i>Type of Confectionary</i>		
	I	II	III
Total cost per lb. (Rs.)	12.76	12.74	14.05

8. In a manufacturing company, a product passes through 5 operations. The output of the 5th operation becomes the finished product. The input, rejection, output and labour and overheads of each operation for a period are as under:

Operation	Input (units)	Rejection (units)	Output (units)	Labour and Overhead (Rs.)
1	21,600	5,400	16,200	1,94,400
2	20,250	1,350	18,900	1,41,750
3	18,900	1,350	17,550	2,45,700
4	23,400	1,800	21,600	1,40,400
5	17,280	2,880	14,400	86,400

You are required to:

- Determine the input required in each operation for one unit of final output.
- Calculate the labour and overhead cost at each operation for one unit of final output and the total labour and overhead cost of all operations for one unit of final output.

(CA, Inter Nov. 1996)

Ans:

	Operation				
	1	2	3	4	5
(i) Input required	2.00	1.50	1.40	1.30	1.20
(ii) Total labour and overhead cost for one unit of final output	Rs. 60.50.				

JOB, CONTRACT AND BATCH COSTING

Learning Objectives:

After reading this chapter, you should be able to:

1. describe job costing — nature and its advantages and disadvantages;
2. explain the nature of job cost sheet and contract costing as well;
3. explain sub-contract, work-in-progress in contract costing, cost-plus contract and batch costing and economic batch quantity;
4. describe how costs are recorded on jobs and on contract as well and
5. explain the methods of determining profit on incomplete contracts and the procedure of ascertaining value and profit of contract.

NATURE OF JOB COSTING

Job costing is a costing method applied to determine the cost of specific jobs or lots of production generally manufactured according to customers' specifications. The main feature of the job order costing system is that no two orders are necessarily alike and all orders do not pass through the same manufacturing process. Generally, the job order system is used by manufacturing concerns where an order is produced to a customer's specifications, such as building, contracting, machine tool manufacturing, furniture, foundries, job printing and general engineering. A job may be a product, unit, batch, sales order, project, contract, service, specific programme or any other cost objective that is clearly distinguishable and unique in terms of materials and other services used.

Advantages

Job costing has the following advantages:

1. More accurate costing is possible because all costs are compiled and specifically identified with a specific order or product.
2. It is simple as the recording of direct materials, and direct labour hours is done by product or job.
3. Job cost sheets can be used to control efficiency and estimate future work.
4. It provides a basis for comparing one job cost to another or for comparing a job cost sheet to a cost estimate.

Disadvantages

Job costing has the following disadvantages:

1. It requires detailed record-keeping for different jobs.
2. The record-keeping for different jobs may prove complicated.
3. A job may be charged for inefficiencies (downtime) although it has not caused it.

JOB COST SHEET AND JOB LEDGER

The focal point of a job order cost system is the cost sheet on which charges for direct materials, direct labour, and indirect manufacturing costs can be accumulated as work on a job order progresses. It is in summary form and records the job number and other specifications and descriptive information as given in the production order. The design of the cost sheet and the number of columns to be used must be determined in terms of departmental and manufacturing characteristics of the business operations. Basically, the recorded costs are grouped under three major headings: material costs, labour costs and applied manufacturing overhead costs. Figure 10.1 presents a specimen of a job cost sheet. When a production order is started in process, a cost sheet identified by a job number is set up in the accounting department.

**ABC Company
Job Order Cost Sheet**

Customer Name _____ Date _____ Job Order No. _____
 Product description _____
 Selling price _____ Total cost _____
 Cost per unit _____

	Department 1	Department 2	Department 3	
Materials:				
Date(s)				
Requisition no.				
Amount				
Labour:				
Date(s)				
Job time card no.				
Amount				
Overhead:				
Rate/Basis				
Amount absorbed				
Cost summary:	Deptt. 1	Deptt. 2	Deptt. 3	Total
Material	_____	_____	_____	_____
Labour	_____	_____	_____	_____
Overhead	_____	_____	_____	_____
Total	_____	_____	_____	_____
Units completed _____		Date Completed _____		

Fig. 10.1 Specimen of a Job Sheet

When the job order is finished/completed, the cost summary at the bottom of the form is completed and a unit cost for the job order is computed.

RECORDING COSTS ON JOBS

Materials Costs

Materials used in manufacturing and/or completing jobs are known as direct materials which become part of the finished product. Direct materials are directly charged to the job on which they are used and indirect materials or factory supplies are part of manufacturing overhead and are allocated to the various jobs.

Labour Costs

Direct labour costs can be identified with specific jobs with the help of “job time tickets”. When a worker begins work on an order, the starting time is noted on the ticket; when the job order is finished, the stopping time is written in and the time spent on a job is noted. Earnings (wages) are then computed using the employee’s hourly rate.

Direct Expenses

Generally speaking, direct expenses are directly charged to individual jobs for which they are incurred. The invoices (of direct expenses) as documentary evidence can be marked with the number of the job to which the cost is to be allocated.

Overhead

Overhead costs are usually charged to work-in-progress by means of a predetermined absorption rate calculated in advance of production. This is derived on the basis of budgeted figures.

RECORDING COMPLETED JOBS

When a job is finished, its cost is determined by totalling prime costs and absorbed overhead. The cost sheet is then marked “completed” and removed from the job ledger. An entry is made to the proper account in the finished goods ledger.

When no unit on a job order is completed, the total cost incurred on the job order so far becomes work-in-progress. Under job costing, the value of closing work-in-progress is obtained from the work-in-progress account. The work-in-progress at the end of an accounting period is carried forward to the subsequent accounting period as opening stock. The expenditure incurred on the job in this subsequent period is added to the opening stock.

Example 10.1

The following information for the year ended 31st December, 2008 is obtained from the books and records of a factory:

	<i>Completed Jobs</i> Rs.	<i>W.I.P.</i> Rs.
Raw material supplied from stores	88,000	32,000
Wages	1,00,000	40,000
Chargeable expenses	10,000	4,000
Materials returned to stores	1,000	—

Factory overheads are 80% of wages. Office overheads are 25% of factory cost and selling distribution overheads are 10% of cost of production.

The complete jobs realised Rs. 4,10,000. Write up:

- (i) Work-in-progress Ledger Control Account
- (ii) Completed Job Ledger Control Account; and
- (iii) Cost of Sales Account

(B. Com. (Hons), Delhi, 2001)

Solution:

Consolidated Work-in-Progress A/c

Dr.	Rs.		Cr.
			Rs.
To Raw Material consumed	32,000		
To Wages	40,000		
To Chargeable Expenses	4,000		
To Factory Overheads (80% of wages)	32,000		
Factory Cost	1,08,000		
To Administrative overheads (25% of Rs. 1,08,000)	27,000		
	1,35,000		1,35,000

Note: Selling and distribution overhead has not been charged in Work- in-progress A/c.

Consolidated Completed Job A/c

Dr.	Rs.		Cr.
			Rs.
To Raw Material Consumed 88,000	87,000	By Customer's A/c (Amt. of Jobs completed)	
Less: Returned to store (-) 1,000			4,10,000
To Wages	1,00,000		
To Chargeable Expense	10,000		
To Factory Over heads (80% of Rs. 1,00,00 of wages)	80,000		
Factory Cost	2,77,000		
To Admn. Overheads (25% of Rs. 2,77,000)	69,250		
Cost of Production	3,46,250		
To Selling and Distribution Overhead	34,625		
To N.P. transferred to P and L A/c	29,125		
	4,10,000		4,10,000

Cost of Sales Account

Dr.	Rs.		Cr.
		By Balance c/d	3,80,875
To Material consumed	87,000		
To Wages	1,00,000		
To Direct Charges	10,000		
To Factory Overhead (80% of wages)	80,000		
Factory Cost	2,77,000		
To Admn. Overheads (25% of Rs. 2,77,000)	69,250		
	3,46,250		
To Selling and Distribution 10% of Rs. 3,46,250	34,625		
Cost of Sales	3,80,875		3,80,875

Example 10.2

Xavier company manufactures many products. Each product passes through two production departments, which have the following cost structures:

	<i>Department A</i>	<i>Department B</i>
Normal monthly volume (based for overhead rate)	5,000 direct labour hours	10,000 pounds of materials
Monthly fixed costs at normal volume	Rs. 10,000	Rs. 40,000
Monthly variable costs at normal volume	15,000	20,000

Two job orders that went through the factory last month had the following results:

	<i>Job 1 (Product X)</i>		<i>Job 2 (Product Y)</i>	
	<i>Quantity</i>	<i>Cost (Rs.)</i>	<i>Quantity</i>	<i>Cost (Rs.)</i>
Direct inputs:				
Direct materials	480 lbs	2,400	1,500 lbs	4,800
Direct labour:				
Department A	180 hrs	1,620	100 hrs	900
Department B	60 hrs	420	40 hrs	280
Output	600 units		1,000 units	

- (a) Calculate the unit cost of each of these jobs on a full costing basis.
- (b) Recalculate unit costs on a variable costing basis.
- (c) Why are the relative variable costs of these two products so different from their relative full costs?

Solution:

(a) Full-costing overhead rates:

Department A: Rs. 25,000/5,000 = Rs. 5 a direct labour-hour

Department B: Rs. 60,000/10,000 = Rs. 6 a pound

Job order costs:		
	<i>Job 1</i>	<i>Job 2</i>
Direct materials	Rs. 2,400	Rs. 4,800
Direct labour:		
Department A	1,620	900
Department B	420	280
Overhead: Department A at Rs. 5	900	500
Department B at Rs. 6	2,880	9,000
Total	Rs. 8,220	Rs. 15,480
Unit cost Job 1, Rs. 8220/600 units,	Rs. 13.70	Rs. 15.48
Job 2, Rs. 15480/1000 units		

(b) Variable costing overhead rates:

 Department A: Rs. 15,000/5,000 = Rs. 3 a direct labour-hour

 Department B: Rs. 20,000/10,000 = Rs. 2 a pound

Job order costs:

	<i>Job 1</i>	<i>Job 2</i>
Direct materials	Rs. 2,400	Rs. 4,800
Direct labour:		
Department A	1,620	900
Department B	420	280
Overhead:		
Department A at Rs. 3	540	300
Department B at Rs. 2	960	3,000
	Rs. 5,940	Rs. 9,280
Unit cost	Rs. 9.90	Rs. 9.28

(c) Variable unit cost of job 2 is less than that of job 1; full cost was greater for job 2 than for job 1. The main reason is that job 2 used much more of department B's capacity than job 1, and department B has a much higher proportion of fixed costs than department A. Total profit is thus much more sensitive to variations in sales of product Y (job 2) than to variations in sales of product X.

Example 10.3

In the current quarter, a company has undertaken two jobs. The data relating to these jobs are as under:

	<i>Job 1102</i>	<i>Job 1108</i>
Selling price	Rs. 1,07,325	Rs. 1,57,920
Profit as percentage on cost	8%	12%
Direct Materials	Rs. 37,500	Rs. 54,000
Direct Wages	Rs. 30,000	Rs. 42,000

It is the policy of the company to charge Factory overheads as percentage on direct wages and Selling and Administration overheads as percentage on Factory cost.

The company has received a new order for manufacturing of a similar job. The estimate of direct materials and direct wages relating to the new order are Rs. 64,000 and Rs. 50,000 respectively. A profit of 20% on sales is required.

You are required to compute

- (i) The rates of Factory overheads and Selling and Administration overheads to be charged.
 (ii) The Selling price of the new order. (CA, PE, Exam II, Group II, Nov. 2002)

Solution:

Working Notes:

1. Computation of total cost of jobs

$$\begin{aligned} \text{Total cost of Job 1102} &= \frac{\text{Rs. } 107,325}{\text{Rs. } 108} \times 100 \\ \text{when 8\% is the profit on cost} &= \text{Rs. } 99,375 \end{aligned}$$

$$\begin{aligned} \text{Total cost of Job 1108} &= \frac{\text{Rs. } 1,57,920}{\text{Rs. } 112} \times 100 \\ \text{when 12\% is the profit on cost} &= \text{Rs. } 1,41,000 \end{aligned}$$

2. Factory overheads = F % of direct wages
 Selling and Administrative overheads = A % of factory cost

- (i) **Computation of rates of factory overheads and selling and administration overheads to be charged.**

Jobs Cost Sheet

	<u>Job 1102</u>	<u>Job 1108</u>
	Rs.	Rs.
Direct materials	37,500	54,000
Direct wages	30,000	42,000
Prime cost	67,500	96,000
Add: Factory overheads	30,000 F	42,000 F
Factory cost	(67,500 + 30,000 F)	(96,000 + 42,000 F)
(Refer to Working Note 2)		
Add: Selling and Administration Overheads	(67,500 + 30,000 F) A	(96,000 + 42,000 F) A
(Refer to Working Note 2)		
Total cost	(67,500 + 30,000 F) (1 + A)	(96,000 + 42,000 F) (1 + A)

Since the total cost of jobs 1102 and 1108 are equal to Rs. 99,375 and Rs. 1,41,000 respectively, therefore we have the following equations (Refer to Working Note 1)

$$(67,500 + 30,000 F) (1 + A) = 99,375 \quad (1)$$

$$(96,000 + 42,000 F) (1 + A) = 1,41,000 \quad (2)$$

$$\text{or } 67,500 + 30,000 F + 67,500 A + 30,000 FA = 99,375$$

$$96,000 + 42,000 F + 96,000 A + 42,000 FA = 1,41,000$$

$$\text{or } 30,000 F + 67,500 A + 30,000 FA = 31,875 \quad (3)$$

$$42,000 F + 96,000 A + 42,000 FA = 45,000 \quad (4)$$

On solving (3) and (4) we get: $A = 0.25$ and $F = 0.40$

Hence $A = 25\%$ and $F = 40\%$

(ii) Selling price of the new order:

	Rs.
Direct materials	64,000
Direct wages	50,000
Prime cost	<u>1,14,000</u>
Factory overheads (40% × Rs. 50,000)	<u>20,000</u>
Factory cost	1,34,000
Selling and Admn. Overheads (25% × Rs. 1,34,000)	<u>33,500</u>
Total cost	<u>1,67,500</u>

If selling price of new order is Rs. 100 then Profit is Rs. 20 and Cost is Rs. 80

Hence selling price of the new order = $\frac{\text{Rs. } 1,67,500}{80} \times 100 = \text{Rs. } 2,09,375$

Example 10.4

A pipe company has been in operation for one year. It manufactures concrete pipes in lengths of 4 m has the necessary equipment to produce 18, 24, 30 and 36 mm pipes. The company has one basic machine to produce pipes. Only one size is made during each working day of eight hours. The last hour is used by the crew for clean-up and, as necessary, for changing the machine so that a different size can be made the following day. Production during the first year was limited to sizes from 18 to 30 mm inclusive. The company has prepared the following schedule of profit and loss for the year just ended:

	Rs.	Rs.
Sales		58,000
Raw materials purchased	17,657	
Direct labour	13,255	
Freight inward	2,447	
Delivery expenses	3,582	
Depreciation: Factory building	600	
Office building	280	
Factory machinery	3,000	
Office furniture	200	
Electric power—factory	1,519	
Shop supplies	2,550	
Office salaries	1,000	
Office salaries and expenses	5,200	
Telephone and telegraph	375	
Repairs and maintenance—factory	2,175	
Commission of sales	2,700	
Other factory expenses	760	
General office expenses	200	
Raw material inventory—Year-end		1,630
Finished goods inventory—Year-end (as estimated)		5,990
Profit for the year	<u>8,120</u>	
	<u>65,620</u>	<u>65,620</u>

374 Cost Accounting

Your review of records discloses the following data as to production and sales:

Pipe diameter	Metres produced	Metres sold	Metres unsold	Kilograms per metre	Total weight (kg)	Production per day (metre)	Selling price per metre (Rs.)
18	7,200	6,200	1,000	150	1,50,000	120	2.20
24	10,200	8,120	2,080	250	5,20,000	100	3.00
30	6,320	5,000	1,320	400	5,28,000	80	4.00

You are required to:

- Compute the manufacturing cost of each size of pipe during the year on a per metre basis.
- Prepare a schedule showing which size of pipe would be most profitable.
- Compute the value for the closing inventory of pipe of each size. (ICWA, Inter)

Solution:

(a) Material Cost

(i) Materials consumed: Raw-materials purchased	Rs. 17,657	
Freight inward	2,447	Rs. 20,104
Year-end inventory		(1,630)
Consumption during the year		<u>Rs. 18,474</u>
(ii) Production in terms of weight (kg)		

Size diameter	Metres produced	Kilograms per metre	Production in weight (kg)
18	7,200	150	10,80,000
24	10,200	250	25,50,000
30	6,320	400	25,28,000
			<u>61,58,000</u>

(iii) Material costs per kg of output = $18,474 / 61,58,000 = \text{Re. } 0.003$ per kg.

(iv) Material costs per metre

Size diameter (in mm)	Kilograms per metre	Rate per kg (Rs.)	Cost per metre (Rs.)
18	150	0.003	0.45
24	250	0.003	0.75
30	400	0.003	1.20

(b) Conversion cost

(i) Conversion cost incurred during the year:

Direct labour		13,255
Depreciation: Factory building	600	
Factory machinery	<u>3,000</u>	3,600
Electric power—factory		1,519
Shop supplies		2,550
Repairs and maintenance—factory		2,175
Other factory expenses		<u>760</u>
Total		<u>Rs. 23,859</u>

(ii) Total number of days worked

Size diameter (in mm)	Metre produced	Production per day	No. of days (2/3)
18	7,200	120	60
24	10,200	100	102
30	6,320	80	79
			Total 241

(iii) Conversion cost per day = (Rs. 23,859/241) = Rs. 99 per day

(iv) Conversion cost per metre

Size diameter (in mm)	Conversion cost (Rs.)	Production per day (metre)	Conversion cost per metre (Rs.)
18	99	120	0.8250
24	99	100	0.9900
30	99	80	1.2375

(a) Statement of Manufacturing Cost (Rs.)

	18 mm (7,200 m)		24 mm (10,200 m)		30 mm (6,320 m)	
	Per metre	Total	Per metre	Total	Per metre	Total
Material cost	0.4500	3,240	0.7500	7,650	1.2000	7,584
Convention cost	0.8250	5,940	0.9900	10,098	1.2375	7,821
Total	1.2750	9,180	1.7400	17,748	2.4375	15,405

(b) Profitability Statement

	18 mm	24 mm	30 mm
Selling price per metre (Rs.)	2.2000	3.0000	4.0000
Manufacturing cost per metre (Rs.)	1.2750	1.7400	2.4375
Gross profit (Rs.)	0.9250	1.2600	1.5625

Conclusion: 30 mm diameter pipe is the most profitable product.

(c) Value of the Closing Inventory

Size diameter (in mm)	Closing inventory (metres)	Manufacturing cost per metre	Value (Rs.)
18	1.000	1.2750	1,275.00
24	2.080	1.7400	3,619.20
30	1.320	2.4375	3,217.50
			Rs. 8,111.70

Notes:

- (i) Manufacturing cost does not include office expenses.
- (ii) Material cost per kg has been worked out for allocating of materials costs to various sizes of pipes.

The reason for this is that it is more logical to assume that material costs vary in direct proportion to the weight of output. This may not always be true. The percentage of 'spoilt jobs' may be different for different sizes of pipes and consequently the output-input ratio may be different for different sizes and this may give misleading results, if material costs are allocated in the ratio of the output weight.

- (iii) Conversion costs per day have been used as the basis for apportionment of conversion costs, because most expenses accrue on the basis of time. The question indicates that 'only one size is made during each working day' and, therefore, per day rate provides an equitable basis for apportionment. However, if all the sizes of pipes were made every day, hourly rate would have to be used instead of the 'rate per day'.

CONTRACT COSTING

Contract costing, sometimes known as terminal costing, follows the same principles as job costing and is used by such concerns as firms of builders and public works contractors who undertake work on a contract basis.

Following are the special features of contract costing:

1. The contractor begins work on a small number of large contracts in the course of a year.
2. The contracts are completed away from the contractor's premises.
3. The contracts may continue over more than one accounting period.
4. Materials are purchased and delivered direct to the contract site and/or are drawn from the central stores.
5. The payroll is prepared at either the site or at a central administrative office.
6. Sub-contractors may be employed, for example, ventilation engineers, lift manufacturers, flooring specialists, etc.
7. Plant and equipment may be purchased, or hired for the duration of the contract from another business or from a central plant department.
8. Payment by the customer for various stages of the contract is made only on receipt of architect's certificate for the completed stage. A reduction called retention money is withheld by the customer until a specific period of time, agreed in the original contract, has passed.
9. The contract price is normally estimated in advance of the work. Additional work found necessary may be charged on a cost-plus basis. In addition, clauses may be inserted to allow the contractor to pass on to the customer additional costs incurred as a result of increase in material, labour and other costs.

RECORDING COSTS ON CONTRACT

Under contract costing, a contract is basically the cost unit and for the purpose of control, it can be regarded as a cost centre. Under contract costing only allocation is required directly to the contract. Overhead costs are normally incurred at the head office and are sometimes known only as storage costs. Such overhead costs tend to be of a small figure and are often absorbed on some arbitrary basis such as a percentage on prime cost.

A separate account, the contract account, is opened for each individual contract for the purpose of determining the profit or loss on each contract. In the contract account the following costs are recorded:

Materials

Materials required for a specific contract are debited to the contract account. Materials returned under the materials returned note are credited with the contract.

Materials transferred from one contract to another are recorded in material transfer notes; the contract receiving the material is debited and the contract giving the material is credited. Materials not required for current use are sometimes sold at the site, and the amount received from sale of materials is credited to the contract account, and any profit or loss, being the difference between the cost and sale value, is transferred to the profit and loss account. This also applies not only to materials, but also to sale of plant, machinery, tools, etc. At the end of the accounting period the value of materials remaining unutilised on site is carried forward as a charge against the next period. In the accounting year, the amount will be debited to the materials or stores at site account and credited to the contract account. Materials stolen or destroyed by fire are transferred to the profit and loss account and also shown on the credit side of the contract account.

The customer or contractee may supply certain materials from own stock to be utilised in construction work. Such materials should not be debited (charged) to the contract account; a separate memorandum record outside the account will be sufficient. Such materials do not affect the contract price.

Wages

Wages of all workers engaged on a particular contract are allocated direct to that contract, regardless of work they perform. Where workers move from one contract to another, time-sheets must be maintained and wages may be distributed on the basis of time spent under each contract. The wages of the head office and central stores are considered as overhead and are charged to contracts on an equitable basis. Wages accrued or outstanding at the end of the period should appear on the debit side of contract.

Expenses

All expenses other than material and wages are charged to individual contracts as and when they are incurred. Examples of such expenses are hire charge of plants obtained from outside, architects' and consultants' fees, electricity, insurance, etc.

Plant and Machinery

For use of plant and machinery in a particular contract, the depreciation may be charged in any one of the following ways:

1. When the plant has been specially purchased for a particular contract and will be exhausted at site, the total cost of the plant is debited to the contract in which it is used. When the contract is completed or the plant is no longer required, it may be sold at site and contract is credited with the sale proceeds. If it is not sold, the contract is credited with the depreciated (revalued amount) value. Thus, the contract account stands debited with the amount of depreciation. This method has the drawback that the debit side is unnecessarily inflated with the plant value, and the cost of contract at first sight appears to be very high. In order to overcome this problem, the difference between the original cost at commencement and the depreciated value at the end of the period is obtained and charged to the contract account concerned as plant depreciation.
2. When the plant is sent to the contract site only for a short period, it is usual to charge the contract for the use on a daily or hourly basis. Depreciation is charged at an hourly rate for the hours the plant has worked. If the plant is taken on hire, only the hire charges are debited to the contract and not depreciation.

Sub-Contract

When a sub-contractor is engaged for a special work connected with the main contract, the work performed by the sub-contractor forms a direct charge to the main contract. The payments made to sub-contractors are

charged in totals to the concerned contract account as direct expense and no detailed record, or break-up of the sub-contract amount is necessary for cost purposes.

Materials issued to the sub-contractor, free of charge, should be charged to the contract account. Heavy tools and equipment may be supplied to sub-contractor on a rental basis. The depreciation on these equipments should be charged to the contract account and the rental received is credited to it or shown as a deduction from the sub-contractor's bill.

VALUE AND PROFIT OF CONTRACT

As the contract work proceeds, the surveyor appointed by the contractee issues certificates to the effect that so much portion has been completed. The contractor will get money according to this certificate and a certain portion thereof shall be retained by the contractee. The money so retained is called retention money. For example, if a certificate has been issued for Rs. 2,00,000 and 70% has been paid, the following entries will be made:

First Method

1. Contractee's account	2,00,000	
To contract A/c		2,00,000
<i>(being value of the work certified)</i>		
2. Bank A/c Dr	1,40,000	
To contractee's A/c		1,40,000
<i>(being amount of cash received)</i>		

Second Method

The amount of work certified will be debited to the work-in-progress account and credited to the contract account. The work-in-progress account is shown as an asset in the balance sheet after deducting the amount received from the contractee. Until the contract is completed, the amount received from the contractee is advance payment and is deducted from work-in-progress in the balance sheet. When the contract is completed, the contractee account is debited with the contract price. In the next year, the work-in-progress account is transferred to the debit side of the contract account. On completion of the contract, the contractee's personal account is debited and the contract account credited. Taking the above example, the journal entries will be as follows:

1. Work-in-progress A/c	Rs. 2,00,000	
To Contract A/c		Rs. 2,00,000
<i>(being work certified)</i>		
2. Bank A/c Dr	Rs. 1,40,000	
To Contractee's A/c		1,40,000
<i>(being amount received)</i>		
<i>Balance Sheet</i>		
Asset Side		(Rs.)
Work-in-progress		2,00,000
Less: Amount received		<u>1,40,000</u>
		60,000

Such work which has not been so far approved by the contractee's architect or surveyor is termed as "work uncertified". It is valued at cost and credited to the contract account and debited to the work-in-progress account, which will be transferred in the next year to the debit side of the contract account.