6 Job Costing & Batch Costing

Basic Concepts

Job Costing	According to this method costs are collected and accumulated according to jobs, contracts, products or work orders. Each job or unit of production is treated as a separate entity for the purpose of costing. Job costing is carried out for the purpose of ascertaining cost of each job and takes into account the cost of materials, labour and overhead etc.
Batch Costing	This is a form of job costing. Under job costing, executed job is used as a cost unit, whereas under batch costing, a lot of similar units which comprises the batch may be used as a cost unit for ascertaining cost. In the case of batch costing separate cost sheets are maintained for each batch of products by assigning a batch number.
Economic Batch Quantity	There is one particular batch size for which both set up and carrying costs are minimum. This size is known as economic or optimum batch quantity. $E.B.Q = \sqrt{\frac{2 \times \text{Annual Demand} \times \text{Setting - up Cost per batch}}{\text{Cost of carrying per unit of production per annum}}}$

SECTION-A

Question-1

Describe job Costing and Batch Costing giving example of industries where these are used?

Solution:

Job Costing: It is a method of costing which is used when the work is undertaken as per the customer's special requirement. When an inquiry is received from the customer, costs expected to be incurred on the job are estimated and on the basis of this estimate, a price is quoted to the customer. Actual cost of materials, labour and overheads are accumulated and

on the completion of job, these actual costs are compared with the quoted price and thus the profit or loss on it is determined.

Job costing is applicable in printing press, hardware, ship-building, heavy machinery, foundry, general engineering works, machine tools, interior decoration, repairs and other similar work.

Batch Costing: It is a variant of job costing. Under batch costing, a lot of similar units which comprises the batch may be used as a unit for ascertaining cost. In the case of batch costing separate cost sheets are maintained for each batch of products by assigning a batch number. Cost per unit in a batch is ascertained by dividing the total cost of a batch by the number of units produced in that batch.

Such a method of costing is used in the case of pharmaceutical or drug industries, readymade garment industries, industries, manufacturing electronic parts of T.V. radio sets etc.

Question-2

Distinguish between Job Costing & Batch Costing?

Solution:

Job Costing and Batch Costing

Accounting to job costing, costs are collected and accumulated according to job. Each job or unit of production is treated as a separate entity for the purpose of costing. Job costing may be employed when jobs are executed for different customers according to their specification.

Batch costing is a form of job costing, a lot of similar units which comprises the batch may be used as a cost unit for ascertaining cost. Such a method of costing is used in case of pharmaceutical industry, readymade garments, industries manufacturing parts of TV, radio sets etc.

Question-3

Distinguish between Job Costing and Process Costing?

Solution:

The main points which distinguish Job Costing and Process Costing are as below:

	Job Costing	Process Costing
(i)	A Job is carried out or a product is produced by specific orders.	The process of producing the product has a continuous flow and the product produced is homogeneous.
(ii)	Costs are determined for each job.	Costs are compiled on time basis i.e., for production of a given accounting period for each process or department.
(iii)	Each job is separate and independent of	Products lose their individual identity as they

	other jobs.	are manufactured in a continuous flow.
(iv)	Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
(v)	Costs are computed when a job is completed. The cost of a job may be determined by adding all costs against the job.	Costs are calculated at the end of the cost period. The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
(vi)	As production is not continuous and each job may be different, so more managerial attention is required for effective control.	Process of production is usually standardized and is therefore, quite stable. Hence control here is comparatively easier.

Question-4

Define Product costs. Describe three different purposes for computing product costs.

Solution:

Definition of product costs

Product costs are inventoriable costs. These are the costs, which are assigned to the product. Under marginal costing variable manufacturing costs and under absorption costing, total manufacturing costs constitute product costs.

Purposes for computing product costs:

The three different purposes for computing product costs are as follows:

(i) *Preparation of financial statements:* Here focus is on inventoriable costs.

(ii) *Product pricing:* It is an important purpose for which product costs are used. For this purpose, the cost of the areas along with the value chain should be included to make the product available to the customer.

(iii) *Contracting with government agencies:* For this purpose government agencies may not allow the contractors to recover research and development and marketing costs under cost plus contracts.

Question-5

In Batch Costing, how is Economic Batch Quantity determined?

Solution:

Economic batch quantity in Batch Costing

In batch costing the most important problem is the determination of 'Economic Batch Quantity'

The determination of economic batch quantity involves two types of costs viz, (i) set up cost and (ii) carrying cost. With the increase in the batch size, there is an increase in the carrying cost but the set-up cost per unit of the product is reduced; this situation is reversed when the batch size is reduced. Thus there is one particular batch size for which both set up and carrying costs are minimum. This size of a batch is known as economic or optimum batch quantity.

Economic batch quantity can be determined with the help of a table, graph or mathematical formula. The mathematical formula usually used for its determination is as follows:

$$EBQ = \sqrt{\frac{2DS}{C}}$$

Where, D = Annual demand for the product

S = Setting up cost per batch

C = Carrying cost per unit of production per annum

Question-6

Z Ltd. Produces product ZZ in batches, management of the Z Ltd. wants to know the number of batches of product ZZ to be produced where the cost incurred on batch setup and carrying cost of production is at optimum level.

Solution:

Economic batch quantity in Batch Costing*:* In batch costing the most important problem is the determination of 'Economic Batch Quantity'. The determination of economic batch quantity involves two types of costs viz, (i) set up cost and (ii) carrying cost. With the increase in the batch size, there is an increase in the carrying cost but the set up cost per unit of product is reduced. This situation is reversed when the batch size is reduced. Thus there is one particular batch size for which both set up and carrying costs are minimum. This size of a batch is known as economic or optimum batch quantity.

Economic batch quantity can be determined with the help of table, graph or mathematical formula. The mathematical formula usually used for its determination is as follows:

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Where, D= Annual demand for the product

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SECTION- B

Question-1

A factory incurred the following expenditure during the year 2013:

	(₹)	(₹)
Direct material consumed		*12,00,000*
Manufacturing Wages		*7,00,000*
Manufacturing overhead:		
Fixed	*3,60,000*	
Variable	*2,50,000*	*6,10,000*
		25,10,000

In the year 2014, following changes are expected in production and cost of production.

(i) Production will increase due to recruitment of 60% more workers in the factory.

(ii) Overall efficiency will decline by 10% on account of recruitment of new workers.

(iii) There will be an increase of 20% in Fixed overhead and 60% in Variable overhead.

(iv) The cost of direct material will be decreased by 6%.

(v) The company desire to earn a profit of 10% on selling price.

Ascertain the cost of production and selling price.

Solution:

Budgeted Cost Sheet for the year 2014

Particulars			(Amount ₹)
Direct material consumed		12,00,000	
Add: 44% due to increased output		5,28,000	
		17,28,000	
Less: 6% for decline in price		1,03,680	16,24,320
Direct wages (manufacturing)		7,00,000	
Add: 60% increase		4,20,000	11,20,000
Prime cost			27,44,320
Manufactured Overhead:			
Fixed	3,60,000		
Add: 20% increase	72,000		
		4,32,000	

Variable	2,50,000		
Add: 60% increase	1,50,000		
		4,00,000	8,32,000
Cost of production			35,76,320
Add: 1/9 of Cost or 10% on selling price			3,97,369
Selling price			39,73,689

Production will increase by 60% but efficiency will decline by 10%.

160 – 10% of 160 = 144%

So increase by 44%.

Note: If we consider that variable overhead once will change because of increase in production (From ₹ 2,50,000 to ₹ 4,00,000) then with efficiency declining by 10% it shall be ₹ 3,60,000 and then again as mentioned in point No. (iii) of this question it will increase by 60% then variable overhead shall be ₹3,60,000 × 160% = ₹ 5,76,000. Hence, total costs shall be ₹37,52,320 and profit shall be 1/9th of ₹37,52,320 = ₹4,16,924. Thus, selling price shall be ₹ 41,69,244.

Question-2

Ares Plumbing and Fitting Ltd. (APFL) deals in plumbing materials and also provides plumbing services to its customers. On 12th August, 2014, APFL received a job order for a students' hostel to supply and fitting of plumbing materials. The work is to be done on the basis of specification provided by the hostel owner. Hostel will be inaugurated on 5th September, 2014 and the work is to be completed by 3rd September, 2014. Following are the details related with the job work:

Direct Materials

APFL uses a weighted average method for the pricing of materials issues.

Opening stock of materials as on 12th August 2014:

- *15mm GI Pipe, 12 units of (15 feet size) @ ₹600 each*
- *20mm GI Pipe, 10 units of (15 feet size) @ ₹660 each*
- *Other fitting materials, 60 units @ ₹26 each*
- *Stainless Steel Faucet, 6 units @ ₹204 each*
- *Valve, 8 units @ ₹404 each*

Purchases:

On 16th August 2014:

- *20mm GI Pipe, 30 units of (15 feet size) @ ₹610 each*

- *10 units of Valve @ ₹402 each*

On 18th August 2014:

- *Other fitting materials, 150 units @ ₹28 each*
- *Stainless Steel Faucet, 15 units @ ₹209 each*

On 27th August 2014:

- *15mm GI Pipe, 35 units of (15 feet size) @ ₹628 each*
- *20mm GI Pipe, 20 units of (15 feet size) @ ₹660 each*
- *Valve, 14 units @ ₹424 each*

Issues for the hostel job:

On 12th August 2014:

- *20mm GI Pipe, 2 units of (15 feet size)*
- *Other fitting materials, 18 units*

On 17th August 2014:

- *15mm GI Pipe, 8 units of (15 feet size)*
- *Other fitting materials, 30 units*

On 28th August 2014:

- *20mm GI Pipe, 2 units of (15 feet size)*
- *15mm GI Pipe, 10 units of (15 feet size)*
- *Other fitting materials, 34 units*
- *Valve, 6 units*

On 30th August:

- *Other fitting materials, 60 units*
- *Stainless Steel Faucet, 15 units*

Direct Labour:

Plumber: 180 hours @ ₹50 per hour (includes 12 hours overtime)

Helper: 192 hours @ ₹35 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ ₹13 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

(a) Calculate the total cost of the job.

(b) Calculate the price to be charged from the customer

Solution:

(a) Calculation of Total Cost for the Hostel Job:

Particulars	Amount (₹)	Amount (₹)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	
- Stainless steel faucet 15 units × $\left(\frac{6\times ₹204+15\times ₹209}{21\text{units}}\right)$	3,113.57	
- Valve 6 units × $\left(\frac{8\times ₹404+10\times ₹402+14\times ₹424}{32\text{units}}\right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours × ₹ 50) + (12 hours × ₹ 25)]	9,300.00	
- Helper [(192 hours × ₹ 35) + (24 hours × ₹ 17.5)]	7,140.00	16,440.00
- Overheads [₹ 13 × (180 + 192) hours]		4,836.00
Total Cost		44,367.95

(b) Price to be charged for the job work:

	Amount (₹)
Total Cost incurred on the job	44,367.95
Add: 25% Profit on Job Price $\left(\frac{44,367.95}{75\%}\times 25\%\right)$	14,789.32
	59,157.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (₹)
17-08-2014	8 units × ₹ 600	4,800.00
28-08-2014	10 units × $\left(\frac{4\times ₹600+35\times ₹628}{39\text{ units}}\right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (₹)
12-08-2014	2 units × ₹ 660	1,320.00
28-08-2014	2 units × $\left(\frac{8\times ₹660+30\times ₹610+20\times ₹660}{58\text{ units}}\right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (₹)
12-08-2014	18 units × ₹ 26	468.00
17-08-2014	30 units × ₹ 26	780.00
28-08-2014	34 units × $\left(\frac{12\times ₹26+150\times ₹28}{162\text{ units}}\right)$	946.96
30-08-2014	60 units × $\left(\frac{12\times ₹26+150\times ₹28}{162\text{ units}}\right)$	1,671.11
		3,866.07

Question-3

Arnav Motors Ltd. manufactures pistons used in car engines. As per the study conducted by the Auto Parts Manufacturers Association, there will be a demand of 80 million pistons in the coming year. Arnav Motors Ltd. is expected to have a market share of 1.15% of the total market demand of the pistons in the coming year. It is estimated that it costs ₹1.50 as inventory holding cost per piston per month and that the set-up cost per run of piston manufacture is ₹ 3,500.

(i) What would be the optimum run size for piston manufacturing?

(ii) Assuming that the company has a policy of manufacturing 40,000 pistons per run, how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

Solution:

(i) Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2 \times D \times S}{C}}$

Where, D = Annual demand i.e. 1.15% of 8,00,00,000 = 9,20,000 units

S = Set-up cost per run = ₹ 3,500

C = Inventory holding cost per unit per annum

= ₹1.5 × 12 months = ₹ 18

EBQ = $\sqrt{\frac{2 \times 9,20,000 \text{units} \times ₹3,500}{₹18}}$ = 18,915 units

(ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set-ups	Set-up Cost (₹)	Inventory holding cost (₹)	Total Cost (₹)
A	40,000 units	23 $\left(\frac{9,20,000}{40,000}\right)$	80,500 (23 × ₹ 3,500)	3,60,000 $\left(\frac{40,000 \times ₹18}{2}\right)$	4,40,500
B	18,915 units	49 $\left(\frac{9,20,000}{18,915}\right)$	1,71,500 (49 × ₹3,500)	1,70,235 $\left(\frac{18,915 \times Rs.18}{2}\right)$	3,41,735
	Extra Cost (A – B)				98,765