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**COSTING**

**PART - I**

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**PROCESS COSTING AND WIP VALUATION**

**Question 1**

Following are the details of Process A and Process B, where output of Process A is transferred as input for Process B.

Particulars	Process A	Process B
Opening work-in-process(units)	10,000	10,000
Opening work-in-process(value)	1,32,900	2,00,500
Materials added in the Process(value)	2,40,000	1,95,900
Labour(value)	3,20,000	3,27,250
Overhead(value)	3,93,000	4,04,100
Expected loss on gross input	6%	5%
Scrap value per unit	Rs. 5	Rs. 8.75
Actual output(units)	70,000	60,000
Closing work-in-process(units)	22,000	18,000

90,000 units of fresh materials was introduced to Process A at a total cost of Rs. 4,50,000. Following are the Degree of Completion

**Process A**

Particulars	Opening Work –in –progress	Scrap	Closing work-in-progress
Materials	83%	90%	75%
Labour	70%	80%	70%
Overheads	60%	70%	60%

**Process B**

Particulars	Opening Work –in –progress	Scrap	Closing work-in-progress
Materials	90%	80%	90%
Labour	80%	70%	85%
Overheads	60%	60%	85%

Prepare Process A and Process B A/c.

**Question 2**

Following details relate to process Z:

		% of completion
Opening WIP	2000 units	
Material introduced	Rs. 30,000	100%
Added material	Rs. 8,000	80%
Labour	Rs. 28,000	70%
Overheads	Rs. 72,000	60%

During the period 40,000 units were received from process A at a total cost of Rs. 5,68,800.

Material added in the process is	Rs. 1,78,000
Labour	Rs. 7,10,000
Overhead	Rs. 21,24,000
Packing cost incurred is	Rs. 50,000

There is an expected loss @ 10 % of throughput (production), having a realizable value of Rs. 7 per unit.

Closing WIP is 3000 units and units transferred to Process C were 35,000 units. Following are % of completion

	<b>Closing WIP</b>	<b>Scrap</b>
Material introduced	100%	100%
Added material	70%	50%
Labour	60%	30%
Overheads	50%	30%

Prepare Process Z account and other accounts.

### Question 3

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

	<b>No. of pcs. Input</b>	<b>No. of pcs. rejected</b>	<b>No. of pcs. output</b>
Process 1	60,000	20,000	40,000
2	66,000	6,000	60,000
3	48,000	8,000	40,000

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

Weight of finished product is 0.10 kgs. And the price of raw material is Rs. 20 per kg.

## JOINT PRODUCT BY PRODUCT

### Question 1

A company processes a raw material in its Department I to produce three products, viz. A, B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in department I at a total cost of Rs. 12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively.

A and B were further processed in Department 2 at a cost of Rs. 1,80,000 and Rs. 1,50,000 respectively. X was further processed in Department 3 at a cost of Rs.

1,08,000. There is no waste in further processing. The details of sales effected during the period were as under:

	A	B	X
Quantity Sold (kgs.)	17,000	5,000	44,000
Slaes value (Rs)	12,24,000	2,50,000	7,92,000

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been Rs. 50, Rs. 40 and Rs. 10 per kg. respectively. Required:

- Prepare a statement showing the apportionment of joint costs to A, B and X.
- Present a statement showing the cost per kg. of each product indicating joint cost, further processing cost and total cost separately.
- Prepare a statement showing the product wise and total profit for the period.
- State with supporting calculations as to whether any or all the products should be further processed or not.

### Question 2

5000 kg of a direct material costing Rs. 12 per kg is processed to obtain three products, that is, X, Y and Z in ratio 3:3:4. Labour cost amounts to Rs. 1,30,000. Production overheads Rs. 60,000. Process loss is expected to be 20%. Each product is processed further and sold at the following prices:

X	Rs. 150 per Kg
Y	Rs. 120 per Kg
Z	Rs. 97.5 per Kg

Further processing costs are

X	Rs. 56 per Kg
Y	Rs. 64 per Kg
Z	Rs. 10 per Kg

- (1) Ascertain cost per unit.
- (2) Also calculate cost per unit as per Constant Gross Margin % method.
- (3) Show the gross margin % of all products under both methods.

### Question 3

The Sunshine Oil Company purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the split off point: M, N, O & P.

Product O is fully processed at the split off point. Product M, N and P can be individually further refined into 'Super M', 'Super N' and 'Super P'. In the most recent month (October, 2018), the output at split off point was:

Product M	3, 00,000 gallons
Product N	1, 00,000 gallons
Product O	50,000 gallons
Product P	50,000 gallons

The joint cost of purchasing the crude vegetable oil and processing it were Rs. 40,00,000.

Sunshine had no beginning or ending inventories. Sales of Product O in October were Rs. 20, 00,000. Total output of products M, N and P was further refined and then sold. Data related to October, 2018 are as follows:

	<b>Further Processing Costs to Make Super Products</b>	<b>Sales</b>
'Super M'	Rs. 80, 00,000	Rs.1, 20, 00,000
'Super N'	Rs. 32, 00,000	Rs.40,00,000
'Super P'	Rs. 36, 00,000	Rs. 48,00,000

Sunshine had the option of selling products M, N and P at the split off point. This alternative would have yielded the following sales for the October, 2018 production:

Product M	Rs. 20, 00,000
Product N	Rs. 12, 00,000
Product P	Rs. 28, 00,000

You are required to answer:

1. How the joint cost of Rs. 40, 00,000 would be allocated between each product under each of the following methods (a) sales value at split off; (b) physical output (gallons); and (c) estimated net realizable value?
2. Could Sunshine have increased its October, 2018 operating profits by making different decisions about the further refining of product M, N or P? Show the effect of any change you recommend on operating profits.

**ABSORPTION COSTING AND OVERHEADS**

**Question 1:**

CHHOTU Ltd. is a manufacturing Company having three production departments. 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December, 2018:-

	Total	A	B	C	X	Y
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Direct Materials		1,000	2,000	4,000	4,000	7,000
Direct Wages		5,000	2,000	8,000	9,000	8,000
Factory Rent	24,000					
Power	17,500					
Depreciation	10,000					
Other Overheads	18,000					
Additional information						
Area (Sq. ft)		500	250	500	250	500
Capital Value of assets (₹ Lakhs)		20	40	20	10	10
Hours		1,000	2,000	4,000	1,000	1,000
Horse power of machines		50	40	20	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	C	X	Y
	%	%	%	%	%
Service Dept. 'X'	50	15	25	-	10
Service Dept. 'Y'	40	55	-	5	-

- (a) A statement showing distribution of overheads to various departments.
- (b) A statement showing re-distribution of service departments expenses to production departments by applying all reciprocal methods.
- (c) Hourly rates of the production departments 'A', 'B' 'C'.
- (d) Following are the product Cost Details:

	<u>P</u>	<u>Q</u>	<u>R</u>
Output in units	10,000	20,000	40,000
Raw Material Required in kgs.	5	6	8
No. of Hrs Dept A	2	5	2
No. of Hrs Dept B	6	3	2
No. of Hrs Dept C	3	4	3

Cost per kg of raw material is Rs. 15.00 and rate of labour is Rs. 10.00 per hour. Calculate Factory cost of three products.

**Question 2**

Factory Overheads Allocated	Rs.
Repairs and Maintenance	4,36,000
Depreciation	15,47,000
Insurance of Machines	8,80,000
Supervisor's Salary	2,67,000
Consumable Stores	11,64,000
General Lighting	3,35,000
Common Factory Maintenance	1,71,000

Total Productive Machine Hours = 40,000 hours (including 8,000 hours of setup time and 32,000 hours of machine running time)

Power costs Rs. 20.00 per hour. Setup time, even though productive, does not consume power. Operator's wages are Rs. 36.00 per hour. An operator attends one machine at a time, while machines are under setup and three machines at a time, while machines are running.

You are required to ascertain the Two – Tier Machine Hour Rate for:

- Setup time and
- Machine Running Time

**Case 1:** Assume that Repairs and maintenance and consumable stores vary with the running of the machine.

**Case 2:** Assume that Repairs and maintenance and consumable stores vary with total productive hours.

### Question 3

In a machine shop, the machine hour rate is worked out at the beginning, on the basis of 13 week period, which is equal to 3 calendar months. The following estimates for operating a machine are relevant:

Total working hours available per week	49 hours
Maintenance time included in the above	2 hours
Setting-up time included in the above	2 hours
Cost Details:	
Operator's wages (per month)	Rs. 650
Supervisory salary (per month) (Common supervisor for 3 machines)	1,500
W.D.V. of machine (Depreciation at 15% p.a.)	1,80,000
Repairs and maintenance (per annum)	16,000
Consumable stores (per annum)	30,000

Rent, rates and taxes Rs. 50,000 p.a. and the machine occupies 10 % of the total area. Power consumed @ 15 units per hour @ 40 paise per unit. Power is required for productive hours only. Setting-up time is part of productive time but no power is required for setting-up jobs.

The operator and supervisor are permanent. Repairs and maintenance and consumable stores vary with the running of the machines.

You are required to calculate a two-tier machine hour rate for Set up time and Running time.

### Question 4:

The following is a schedule of expenses allocated to three machines A, B and C viz

	A	B	C
Rent and Rates	75	59	120
Insurance	2	1	4
Power	128	146	273
Supervision	40	30	60
Organization (wages of clerks Time-keeper, Forman etc.)	10	7	15
Store services	20	29	46
Tool setters	93	78	129
Tool makers	194	145	214
Oil and sundries	8	12	7
Depreciation and repairs	69	100	83
<b>Total</b>	<b>639</b>	<b>607</b>	<b>951</b>





Department	Direct materials Rs.	Direct Wages Rs.	Direct Labour Hours	Machine Hours
Machining	1,200	240	60	180
Assembly	600	360	120	30
Packing	300	60	40	---

The factory adds 30% on the factory cost to cover administrative and selling overheads and profit. Required:

- Calculate the overhead absorption rate as per the current policy of the company and determine the selling price of the Job No. CW 7083
- Suggest any suitable alternative method(s) of absorption of the factory overheads and calculate the overhead recovery rates based on the method(s) so recommended by you.
- Determine the selling price of Job CW 7083 based on the overhead application rates calculate in (b) above.

Calculate the department wise and total under or over recovery of overheads based on the company's current policy and the method(s) recommended by you.

**ACTIVITY BASED COSTING**

**Question 1**

A company produces three products A, B and C for which the standard costs and quantities per unit are as follows :

<b>Products</b>	<b>A</b>	<b>B</b>	<b>C</b>
Quantity produced	10,000	20,000	30,000
Direct material / p.u. (₹)	50	40	30
Direct labour / p.u. (₹)	30	40	50
Labour hours / p.u	3	4	5
Machine hours / p.u.	4	4	7
No. of purchase requisitions	1,200	1,800	2,000
No. of set ups	240	260	300

Production overhead split by departments :

- Department 1 = ₹ 11,00,000

- Department 2 = ₹ 15,00,000

Department 1 is labour intensive and Department 2 is machine intensive.

Production overhead split by activity :-

- Production scheduling / machine set up   ₹ 12,00,000

- Receiving / inspecting   ₹ 14,00,000

₹ 26,00,000

Number of batches received / inspected = 5,000

Number of batches for scheduling and set - up = 800

You are required to :

- (i) Prepare product cost statement under traditional Absorption Costing and Activity Based Costing method.
- (ii) Compare the results under two methods.

**Question 2**

During the Last 20 years, KL Ltd's manufacturing operation has become increasingly automated with Computer - controlled robots replacing operators. KL currently manufactures over 100 products of varying levels of design complexity. A single plant wise overhead absorption rate, based on direct labour hours, is used to absorb overhead costs.

In the quarter ended March, KL's manufacturing overhead costs were :

	(₹ '000)
Equipment operation expenses	125
Equipment maintenance expense	25
Wages paid to technicians	85
Wages paid to Storeman	35
Wages paid to despatch staff	40
	310

During the quarter, the company reviewed the Cost Accounting System and concluded that absorbing overhead costs to individual products on a labour hour absorption basis is meaningless. Overhead costs should be attributed to products using an Activity Based Costing (ABC) system and the following was identified as the most significant activities :

- (i) Receiving component consignments from suppliers
- (ii) Setting up equipment for production runs
- (iii) Quality inspections
- (iv) Despatching goods as per customers orders.

Equipment operation and maintenance expenses are apportioned as :

- \* Component stores 15%, manufacturing 70% and goods dispatch 15% Technician's wages are apportioned as :
- \* Equipment maintenance 30%, set up equipment for production runs 40% and quality inspections 30%.

During the quarter :

- (i) a total of 2000 direct labour hours were worked (paid at ` 12 per hr.)
- (ii) 980 components consignments were received from suppliers
- (iii) 1020 production runs were set up
- (iv) 640 quality inspections were carried out
- (v) 420 orders were despatched to customers.

KL's production during the quarter included components R, S and T. The following information is available :

	Component R	Component S	Component T
Direct labour Hrs. worked	25	480	50
Direct Material Cost	₹ 1,200	₹ 2,900	₹ 1,800
Component Consignments Received	42	24	28
Production runs	16	18	12
Quality Inspections	10	8	18
Orders (goods) despatched	22	85	46
Quantity produced	560	12,800	2,400

**Required:-**

- (1) Calculate the unit cost of R, S and T components, using KL's existing cost accounting system.
- (2) Calculate the unit cost of components R, S and T using ABC system.