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Process & Operation Costing

Basic Concepts

Process Costing	Used in industries where the material has to pass through two or more processes for being converted into a final product.
Operation Costing	It is the refinement of process costing. It is concerned with the determination of the cost of each operation rather than the process.
Equivalent Production Units	This concept use in the industries where manufacturing is a continuous activity. Converting partly finished units into equivalent finished units.
Inter Process Profit	The output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. The difference between cost and the transfer price is known as inter-process profits.
	Treatment of Losses in Process Costing
Normal Process Loss	The cost of normal process loss is absorbed by good units produced under the process. The amount realised by the sale of normal process loss units should be credited to the process account
Abnormal Process Loss	The total cost of abnormal process loss is credited to the process account from which it arise. The total cost of abnormal process loss is debited to costing profit and loss account
Abnormal Gain	The process account under which abnormal gain arises is debited with the abnormal gain and credited to Abnormal gain account which will be closed by transferring to the Costing Profit and loss account.
	Valuation of Work-in-Progress
First-in-First-Out (FIFO) Method	Under this method the units completed and transferred include completed units of opening work-in-progress and subsequently introduced units. Proportionate cost to complete the opening work-in-progress and that to process the completely processed

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	units during the period are derived separately. The cost of opening work-in-progress is added to the proportionate cost incurred on completing the same to get the complete cost of such units. In this method the closing stock of Work in progress is valued at current cost.
Last-in-First-Out (LIFO) Method.	According to this method units lastly entering in the process are the first to be completed. This assumption has a different impact on the costs of the completed units and the closing inventory of work-in-progress. The completed units will be shown at their current cost and the closing inventory of work-in-progress will continue to appear at the cost of the opening inventory of work-in-progress.
Weighted Average Cost Method	Under this method, the cost of opening work-in-progress and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units. The equivalent production in this case consists of work-load already contained in opening work-in-process and work-load of current period.

SECTION-A

Question 1

Explain briefly the procedure for the valuation of Work-in-process.

Solution

Valuation of Work-in process: The valuation of work-in-process can be made in the following three ways, depending upon the assumptions made regarding the flow of costs.

- First-in-first-out (FIFO) method
- Last-in-first-out (LIFO) method
- Average cost method

A brief account of the procedure followed for the valuation of work-in-process under the above three methods is as follows;

FIFO method: According to this method the units first entering the process are completed first. Thus the units completed during a period would consist partly of the units which were incomplete at the beginning of the period and partly of the units introduced during the period.

The cost of completed units is affected by the value of the opening inventory, which is based on the cost of the previous period. The closing inventory of work-in-process is valued at its current cost.

LIFO method: According to this method units last entering the process are to be completed first. The completed units will be shown at their current cost and the closing-work in process will continue to appear at the cost of the opening inventory of work-in-progress along with current cost of work in progress if any.

Average cost method: According to this method opening inventory of work-in-process and its costs are merged with the production and cost of the current period, respectively. An average cost per unit is determined by dividing the total cost by the total equivalent units, to ascertain the value of the units completed and units in process.

Question 2

Explain equivalent units.

Solution:

When opening and closing stocks of work-in-process exist, unit costs cannot be computed by simply dividing the total cost by total number of units still in process. We can convert the work-in-process units into finished units called equivalent units so that the unit cost of these units can be obtained.

$$\text{Equivalent Completed Units} = \text{Actual number of units in the process of manufacture} \times \text{Percentage of work completed}$$

It consists of balance of work done on opening work-in-process, current production done fully and part of work done on closing WIP with regard to different elements of costs viz., material, labour and overhead.

Question 3

“Operation costing is defined as refinement of Process costing.” Explain it.

Solution:

Operation costing is concerned with the determination of the cost of each operation rather than the process:

- In the industries where process consists of distinct operations, the operation costing method is applied.
 - It offers better control and facilitates the computation of unit operation cost at the end of each operation.
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Question 4

What is inter-process profit? State its advantages and disadvantages.

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Solution:

In some process industries the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. *The difference between cost and the transfer price is known as inter-process profits.*

The advantages and disadvantages of using inter-process profit, in the case of process type industries are as follows:

Advantages:

1. Comparison between the cost of output and its market price at the stage of completion is facilitated.
2. Each process is made to stand by itself as to the profitability.

Disadvantages:

1. The use of inter-process profits involves complication.
 2. The system shows profits which are not realised because of stock not sold out
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SECTION- B

Question 1

Following information is available regarding process A for the month of February, 2014:

Production Record:

Units in process as on 01.02.2014 (All materials used, 25% complete for labour and overhead)	4,000
New units introduced	16,000
Units completed	14,000
Units in process as on 28.02.2014 (All materials used, 33-1/3% complete for labour and overhead)	6,000

Cost Records:

Work-in-process as on 01.02.2014	(`)
Materials	6,000
Labour	1,000
Overhead	<u>1,000</u>
	<u>8,000</u>
Cost during the month	
Materials	25,600
Labour	15,000
Overhead	<u>15,000</u>
	<u>55,600</u>

Presuming that average method of inventory is used, prepare:

- (i) Statement of Equivalent Production.
- (ii) Statement showing Cost for each element.
- (iii) Statement of Apportionment of cost.
- (iv) Process Cost Account for Process A.

Solution:

(i) **Statement of Equivalent Production (Average cost method)**

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%*)	Units**	(%)*	Units**	(%)*	Units**
20,000	Completed	14,000	100	14,000	100	14,000	100	14,000
	WIP	6,000	100	6,000	33-1/3	2,000	33-1/3	2,000
20,000		20,000		20,000		16,000		16,000

*Percentage of completion

** Equivalent units

(ii) **Statement showing Cost for each element**

Particulars	Materials	Labour	Overhead	Total
Cost of opening work-in-progress (`)	6,000	1,000	1,000	8,000
Cost incurred during the month (`)	25,600	15,000	15,000	55,600
Total cost (`) : (A)	31,600	16,000	16,000	63,600
Equivalent units : (B)	20,000	16,000	16,000	
Cost per equivalent unit (`) : C= (A ÷ B)	1.58	1	1	3.58

(iii) **Statement of Apportionment of cost**

	(`)	(`)
Value of output transferred: (A) (14,000 units × ` 3.58)		50,120
Value of closing work-in-progress: (B)		
Material (6,000 units × ` 1.58)	9,480	
Labour (2,000 units × ` 1)	2,000	
Overhead (2,000 units × ` 1)	2,000	13,480
Total cost : (A + B)		63,600

(iv) **Process- A Account**

Particulars	Units	(`)	Particulars	Units	(`)
To Opening WIP	4,000	8,000	By Completed units	14,000	50,120
To Materials	16,000	25,600	By Closing WIP	6,000	13,480

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To Labour		15,000			
To Overhead		15,000			
	20,000	63,600		20,000	63,600

Question 2

From the following Information for the month ending October, 2013, prepare Process Cost accounts for Process III. Use First-in-first-out (FIFO) method to value equivalent production.

Direct materials added in Process III (Opening WIP)	2,000 units at ` 25,750
Transfer from Process II	53,000 units at ` 4,11,500
Transferred to Process IV	48,000 units
Closing stock of Process III	5,000 units
Units scrapped	2,000 units
Direct material added in Process III	` 1,97,600
Direct wages	` 97,600
Production Overheads	` 48,800

Degree of completion:

	Opening Stock	Closing Stock	Scrap
Materials	80%	70%	100%
Labour	60%	50%	70%
Overheads	60%	50%	70%

The normal loss in the process was 5% of production and scrap was sold at ` 3 per unit.

Solution:

Process III
Process Cost Sheet (FIFO Method)
 Opening Stock: 2,000 units; Introduced: 53,000 units
Statement of Equivalent Production

Input		Output		Equivalent production					
Item	Units	Item	Units	Mat- A	(%)	Mat- B	(%)	Labour & OHs.	(%)
Opening stock	2,000	Work on opening WIP	2,000	-	-	400	20	800	40
Process II transfer	53,000	Introduced & completed during							

	the period (48,000 – 2000)	46,000	46,000	100	46,000	100	46,000	100
		48,000						
	Normal Loss (2,000+53,000 – 5,000) x 5%	2,500	-	-	-	-	-	-
	Closing WIP	5,000	5,000	100	3,500	70	2,500	50
		55,500	51,000		49,900		49,300	
	Abnormal Gain	500	500	100	500	100	500	100
55,000		55,000	50,500		49,400		48,800	

Statement of Cost for each Element

Element of cost	Cost (₹)	Equivalent Production	Cost per unit (₹)
Material A:			
Transfer from Process-II	4,11,500		
Less: Scrap value of Normal Loss (2,500 × ₹ 3)	7,500		
	4,04,000	50,500	8
Material B	1,97,600	49,400	4
Wages	97,600	48,800	2
Overheads	48,800	48,800	1
	7,48,000		15

Process Cost Sheet

	(₹)
Opening WIP (for completion):	
Material- B (400 units × ₹ 4)	1,600
Wages (800 units × ₹ 2)	1,600
Overheads (800 units × ₹ 1)	800
	4,000
Introduced and completely processed during the period (46,000 units × ₹ 15)	6,90,000
Closing WIP:	
Material- A (5,000 units × ₹ 8)	40,000
Material- B (3,500 units × ₹ 4)	14,000

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Wages (2,500 units × ₹ 2)	5,000
Overheads (2,500 units × ₹ 1)	2,500
	61,500
Abnormal Gain (500 units × ₹ 15)	7,500

Process III A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Balance b/d	2,000	25,750	By Normal Loss	2,500	7,500
To Process II A/c	53,000	4,11,500	By Process IV A/c (₹ 6,90,000 + ₹ 4,000 + ₹ 25,750)	48,000	7,19,750
To Direct Material		1,97,600	By Balance c/d	5,000	61,500
To Direct Wages		97,600			
To Production OH		48,800			
To Abnormal Gain	500	7,500			
	55,500	7,88,750		55,500	7,88,750

Question 3

A Company produces a component, which passes through two processes. During the month of April, 2014, materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process I costs incurred were as follows:

Direct Materials	₹ 15,000
Direct Wages	₹ 18,000
Factory Overheads	₹ 12,000

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

No further process material costs occur after introduction at the first process until the end of the second process, when protective packing is applied to the completed components. The process and packing costs incurred at the end of the Process II were:

Packing Materials	₹ 4,000
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Direct Wages ` 3,500
 Factory Overheads ` 4,500

Required:

- (i) Prepare Statement of Equivalent Production, Cost per unit and Process I A/c.
- (ii) Prepare statement of Equivalent Production, Cost per unit and Process II A/c.

Solution:

Process I

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
40,000	Completed	30,000	100	30,000	100	30,000	100	30,000
	Closing WIP	10,000	100	10,000	50	5,000	50	5,000
40,000		40,000		40,000		35,000		35,000

Particulars	Materials	Labour	Overhead	Total
Cost incurred (`)	15,000	18,000	12,000	45,000
Equivalent units	40,000	35,000	35,000	
Cost per equivalent unit (`)	0.3750	0.5143	0.3428	1.2321

Process- I Account

Particulars	Units	(`)	Particulars	Units	(`)
To Materials	40,000	15,000	By Process-II A/c (30,000 units × ` 1.2321)	30,000	36,964
To Labour		18,000	By Closing WIP	10,000	8,036*
To Overhead		12,000			
	40,000	45,000		40,000	45,000

* (Material 10,000 units × ` 0.3750) + (Labour 5,000 units × ` 0.5143) + (Overheads 5,000 units × ` 0.3428) = ` 3,750 + ` 2,572 + ` 1,714 = ` 8,036

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Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--
	WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

Particulars	Materials	Labour	Overhead	Total
Process-I Cost	36,964	--	--	36,964
Cost incurred (`)	--	3,500	4,500	8,000
Equivalent units	29,800	28,450	28,450	
Cost per equivalent unit (`)	1.2404	0.1230	0.1582	1.5216

Process- II Account

Particulars	Units	(`)	Particulars	Units	(`)
To Process-I A/c	30,000	36,964	By Normal loss A/c	200	--
To Packing Material	--	4,000	By Finished Goods Stock A/c	28,000*	46,605
To Direct Wages	--	3,500	By Closing WIP	1,800**	2,359
To Factory Overhead	--	4,500			
	30,000	48,964		30,000	48,964

* $28,000 \times \text{` } 1.5216 = \text{` } 42,605 + \text{` } 4,000$ (Packing Material Cost) = ` 46,605

** $1,800 \text{ units} \times \text{` } 1.2404 + 450 \text{ units} \times (\text{` } 0.1230 + \text{` } 0.1582) = \text{` } 2,359$

Question 4

A Chemical Company carries on production operation in two processes. The material first pass through Process I, where Product 'A' is produced.

Following data are given for the month just ended:

Material input quantity	2,00,000 kg.
Opening work-in-progress quantity	

<i>(Material 100% and conversion 50% complete)</i>	40,000 kg.
<i>Work completed quantity</i>	1,60,000 kg.
<i>Closing work-in-progress quantity (Material 100% and conversion two-third complete)</i>	30,000 kg.
<i>Material input cost</i>	` 75,000
<i>Processing cost</i>	` 1,02,000
<i>Opening work-in-progress cost</i>	
<i>Material cost</i>	` 20,000
<i>Processing cost</i>	` 12,000

Normal process loss in quantity may be assumed to be 20% of material input. It has no realisable value.

Any quantity of Product 'A' can be sold for ` 1.60 per kg.

Alternatively, it can be transferred to Process II for further processing and then sold as Product 'AX' for ` 2 per kg. Further materials are added in Process II, which yield two kg. of product 'AX' for every kg. of Product 'A' of Process I.

Of the 1,60,000 kg. per month of work completed in Process I, 40,000 kg. are sold as Product 'A' and 1,20,000 kg. are passed through Process II for sale as Product 'AX'. Process II has facilities to handle upto 1,60,000 kg. of Product 'A' per month, if required.

The monthly costs incurred in Process II (other than the cost of Product 'A') are:

	1,20,000 kg. of Product 'A' input (`)	1,60,000 kg. of Product 'A' input (`)
<i>Materials Cost</i>	1,32,000	1,76,000
<i>Processing Costs</i>	1,20,000	1,40,000

Required:

- (i) Determine, using the weighted average cost method, the cost per kg. of Product 'A' in Process I and value of both work completed and closing work-in-progress for the month just ended.
- (ii) Is it worthwhile processing 1,20,000 kg. of Product 'A' further?
- (iii) Calculate the minimum acceptable selling price per kg., if a potential buyer could be found for additional output of Product 'AX' that could be produced with the remaining Product 'A' quantity.

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Solution

(i)

Process- I Statement of Equivalent Production

Inputs		Output		Equivalent output			
Particulars	Kg.	Particulars	Kg.	Material		Conversion	
				(%)	kg.	(%)	kg.
Opening W.I.P.	40,000	Normal loss	40,000	--	--	--	--
New material introduced	2,00,000	Units introduced & completed	1,60,000	100	1,60,000	100	1,60,000
		Abnormal loss	10,000	100	10,000	100	10,000
		Closing WIP	30,000	100	30,000	2/3 rd	20,000
	2,40,000		2,40,000		2,00,000		1,90,000

Process- I Statement of Cost for each element

Elements of cost	Costs of opening WIP	Costs in process	Total cost	Equivalent units	Cost per Kg.
	(`)	(`)	(`)	Kg.	(`)
Material	20,000	75,000	95,000	2,00,000	0.475
Conversion cost	12,000	1,02,000	1,14,000	1,90,000	0.600
	32,000	1,77,000	2,09,000		1.075

Statement of Apportionment of Cost

Units completed	Elements	Equivalent units (Kg.)	Cost/unit (`)	Cost (`)	Total cost (`)
Work completed	Material	1,60,000	0.475	76,000	
	Conversion	1,60,000	0.600	<u>96,000</u>	1,72,000
Closing WIP	Material	30,000	0.475	14,250	
	Conversion	20,000	0.600	<u>12,000</u>	26,250

(ii) Statement showing comparative data to decide whether 1,20,000 kg. of product 'A' should be processed further into 'AX'.

Alternative I – To sell product 'A' after Process – I

Sales 1,20,000 kg. × ` 1.60	1,92,000
Less: Cost from Process- I 1,20,000 kg. × ` 1.075	<u>1,29,000</u>
Profit	<u>63,000</u>

Alternative II – Process further into ‘AX’

Sales 2,40,000 kg. × ` 2.00	4,80,000
Less: Cost from Process- I 1,20,000 kg. × ` 1.075	= ` 1,29,000
Material in Process- II	= ` 1,32,000
Processing cost in Process- II	= ` <u>1,20,000</u>
Profit	<u>99,000</u>

Hence company should process further

It will increase profit by ` 99,000 – ` 63,000 = ` 36,000

(iii) Calculation of minimum selling price per kg.:

Cost of processing remaining 40,000 kg. further	(`)
Material ` 1,76,000 – ` 1,32,000	44,000
Processing cost ` 1,40,000 – ` 1,20,000	20,000
Cost from process- I relating to 40,000 kg. ‘A’ (40,000 kg. × ` 1.075)	43,000
Benefit foregone if 40,000 kg. ‘A’ are further processed	
40,000 kg. (` 1.60 – ` 1.075)	<u>21,000</u>
Total cost	<u>1,28,000</u>
Additional quantity of product ‘AX’ (40,000 kg. × ` 2)	<u>80,000</u>

$$\therefore \text{Minimum selling price} \left(\frac{\text{` 1,28,000}}{80,000 \text{ kg.}} \right) = \text{` 1.60}$$

Question 5

Following details are related to the work done in Process ‘A’ of XYZ Company during the month of March, 2014:

	(`)
<i>Opening work-in-progress (2,000 units):</i>	
Materials	80,000
Labour	15,000
Overheads	45,000
<i>Materials introduced in Process ‘A’ (38,000</i>	<i>14,80,000</i>
<i>units) Direct labour</i>	<i>3,59,000</i>
<i>Overheads</i>	<i>10,77,000</i>
<i>Units scrapped: 3,000 units,</i>	
<i>Degree of completion:</i>	

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Materials	100%
Labour and overheads	80%
Closing work-in-progress : 2,000 units,	
Degree of Completion:	
Materials	100%
Labour and overheads	80%
Units finished and transferred to Process 'B' : 35,000 units	
Normal Loss:	
5% of total input including opening work-in-progress	
Scrapped units fetch ₹ 20 per piece.	

You are required to prepare:

- (i) Statement of equivalent production;
- (ii) Statement of cost;
- (iii) Statement of distribution cost; and
- (iv) Process 'A' Account, Normal and Abnormal Loss Accounts.

Solution:

(i) **Statement of Equivalent Production**

Input	Units	Output	Units	Equivalent production			
				Material		Labour & Overheads	
				(%)	Units	(%)	Units
Opening WIP	2,000	Completed and transferred to Process 'B'	35,000	100	35,000	100	35,000
Units introduced	38,000	Normal loss (5% of 40,000 units)	2,000	--	--	--	--
		Abnormal loss	1,000	100	1,000	80	800
		Closing WIP	2,000	100	2,000	80	1,600
	40,000		40,000		38,000		37,400

(ii) **Statement of Cost**

Details	Cost at the beginning of process	Cost added	Total cost	Equivalent Units	Cost per unit
	(`)	(`)	(`)	(`)	(`)
Material	80,000	14,80,000	15,60,000		
Less: Value of normal loss (2,000 units × ` 20)			(40,000)		
			15,20,000	38,000	40
Labour	15,000	3,59,000	3,74,000	37,400	10
Overheads	45,000	10,77,000	11,22,000	37,400	30
Total	1,40,000	29,16,000	30,16,000		80

(iii) **Statement of Distribution of Cost**

	(`)
Completed and transferred to Process-B (35,000 units × ` 80)	28,00,000
Abnormal Loss:	
Materials (1,000 units × ` 40)	40,000
Wages (800 units × ` 10)	8,000
Overheads (800 units × ` 30)	24,000
	72,000
Closing WIP:	
Materials (2,000 units × ` 40)	80,000
Wages (1,600 units × ` 10)	16,000
Overheads (1,600 units × ` 30)	48,000
	1,44,000

(iv) **Process 'A' Account**

Dr.			Cr.		
Particulars	Units	Amount	Particulars	Units	Amount
To Opening WIP	2,000	1,40,000*	By Normal Loss	2,000	40,000
To Material introduced	38,000	14,80,000	By Abnormal loss	1,000	72,000
To Direct labour		3,59,000	By Process 'B' A/c transfer to next process	35,000	28,00,000

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To Overheads		10,77,000	By Closing WIP	2,000	1,44,000
	40,000	30,56,000		40,000	30,56,000

*Materials + Labour + Overheads = ₹ (80,000 + 15,000 + 45,000) = ₹ 1,40,000.

Normal Loss Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process-A A/c	2,000	40,000	By Cost Ledger Control A/c	2,000	40,000
	2,000	40,000		2,000	40,000

Abnormal Loss Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process-A A/c	1,000	72,000	By Cost Ledger Control A/c.	1,000	20,000
			By Costing Profit & Loss A/c.		52,000
	1,000	72,000		1,000	72,000

Question 6

A product passes through three processes 'X', 'Y' and 'Z'. The output of process 'X' and 'Y' is transferred to next process at cost plus 20 per cent each on transfer price and the output of process 'Z' is transferred to finished stock at a profit of 25 per cent on transfer price. The following information are available in respect of the year ending 31st March, 2014:

	Process-X	Process-Y	Process-Z	Finished Stock
	(₹)	(₹)	(₹)	(₹)
Opening stock	15,000	27,000	40,000	45,000
Material	80,000	65,000	50,000	--
Wages	1,25,000	1,08,000	92,000	--
Manufacturing Overheads	96,000	72,000	66,500	--
Closing stock	20,000	32,000	39,000	50,000
Inter process profit included in Opening stock	NIL	4,000	10,000	20,000

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from process 'Z'. Sales of the finished stock during the period was ₹ 14,00,000.

You are required to prepare:

- Process accounts and finished stock account showing profit element at each stage.
- Costing Profit and Loss account.

(iii) Show the relevant items in the Balance Sheet.

Solution:

(i) **Process 'X' Account** Cr.
Dr.

Particulars	Cost (`)	Profit (`)	Total (`)	Particulars	Cost (`)	Profit (`)	Total (`)
To Opening Stock	15,000	–	15,000	By Process 'Y' A/c (Transfer)	2,96,000	74,000	3,70,000
To Material	80,000	–	80,000				
To Wages	1,25,000	–	1,25,000				
Total	2,20,000	–	2,20,000				
Less: Closing stock	20,000	–	20,000				
Prime Cost	2,00,000		2,00,000				
To Manufacturing Overheads	96,000	–	96,000				
Total cost	2,96,000	–	2,96,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)		74,000	74,000				
	2,96,000	74,000	3,70,000		2,96,000	74,000	3,70,000

Process 'Y' Account

Dr. Cr.

Particulars	Cost (`)	Profit (`)	Total (`)	Particulars	Cost (`)	Profit (`)	Total (`)
To Opening Stock	23,000	4,000	27,000	By Process 'Z' A/c (Transfer)	5,36,379	2,26,121	7,62,500
To Process 'X' A/c	2,96,000	74,000	3,70,000				
To Material	65,000	–	65,000				
To Wages	1,08,000	–	1,08,000				
Total	4,92,000	78,000	5,70,000				
Less: Closing stock	27,621	4,379	32,000				
Prime Cost	4,64,379	73,621	5,38,000				
To Manufacturing Overheads	72,000	–	72,000				
Total cost	5,36,379	73,621	6,10,000				

9.18 Cost Accounting

To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)	--	1,52,500	1,52,500				
	5,36,379	2,26,121	7,62,500		5,36,379	2,26,121	7,62,500

Process 'Z' Account

Dr.

Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	30,000	10,000	40,000	By Finished Stock A/c (Transfer)	7,45,629	5,50,371	12,96,000
To Process 'Y' A/c	5,36,379	2,26,121	7,62,500				
To Material	50,000	--	50,000				
To Wages	92,000	--	92,000				
Total	7,08,379	2,36,121	9,44,500				
Less: Closing stock	29,250	9,750	39,000				
Prime Cost	6,79,129	2,26,371	9,05,500				
To Manufacturing Overheads	66,500	--	66,500				
Total cost	7,45,629	2,26,371	9,72,000				
To Costing Profit and Loss A/c (25% on transfer Price or 33 1/3% on cost)	--	3,24,000	3,24,000				
	7,45,629	5,50,371	12,96,000		7,45,629	5,50,371	12,96,000

Finished Stock Account

Dr.

Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	25,000	20,000	45,000	By Costing P&L A/c A/c (Transfer)	7,41,862	6,58,138	14,00,000
To Process 'Z' A/c	7,45,629	5,50,371	12,96,000				
Total	7,70,629	5,70,371	13,41,000				
Less: Closing stock	28,767	21,233	50,000				
To Costing Profit and Loss A/c	7,41,862	5,49,138	12,91,000				
		1,09,000	1,09,000				
	7,41,862	6,58,138	14,00,000		7,41,862	6,58,138	14,00,000

**Costing Profit & Loss Account
for the year ending 31st March, 2014**

Particulars	Amount (`)	Particulars	Amount (`)
To Provision for unrealized profit on closing stock (` 4,379 + ` 9,750 + ` 21,233)	35,362	By Provision for unrealized profit on opening stock (` 4,000 + ` 10,000 + ` 20,000)	34,000
To Net Profit	6,58,138	By Process X A/c	74,000
		By Process Y A/c	1,52,500
		By Process Z A/c	3,24,000
		By Finished Stock A/c	1,09,000
	6,93,500		6,93,500

Workings:

Calculation of amount of unrealized profit on closing stock:

Process 'X' = Nil

$$\text{Process 'Y'} = \frac{\text{` 78,000}}{\text{` 5,70,000}} \times \text{` 32,000} = \text{` 4,379.}$$

$$\text{Process 'Z'} = \frac{\text{` 2,36,121}}{\text{` 9,44,500}} \times \text{` 39,000} = \text{` 9,750.}$$

$$\text{Finished Stock} = \frac{\text{` 5,50,371}}{\text{` 12,96,000}} \times \text{` 50,000} = \text{` 21,233.}$$

Balance Sheet as on 31st March, 2014 (Extract)

Liabilities	Amount (`)	Assets	Amount (`)
Net profit	6,58,138	Closing stock:	
		Process – X	20,000
		Process – Y	32,000
		Process – Z	39,000
		Finished stock	50,000
			1,41,000
		Less: Provision for unrealized profit	35,362
			1,05,638

9.20 Cost Accounting

Question 7

ABC Limited manufactures a product 'ZX' by using the process namely RT. For the month of May, 2014, the following data are available:

	Process RT
Material introduced (units)	16,000
Transfer to next process (units)	14,400
Work in process:	
At the beginning of the month (units)	4,000
(4/5 completed)	
At the end of the month (units)	3,000
(2/3 completed)	
Cost records:	
Work in process at the beginning of the month	
Material	` 30,000
Conversion cost	` 29,200
Cost during the month : materials	` 1,20,000
Conversion cost	` 1,60,800

Normal spoiled units are 10% of good finished output transferred to next process.

Defects in these units are identified in their finished state. Material for the product is put in the process at the beginning of the cycle of operation, whereas labour and other indirect cost flow evenly over the year. It has no realizable value for spoiled units.

Required:

- (i) Statement of equivalent production (Average cost method);
- (ii) Statement of cost and distribution of cost;
- (iii) Process accounts.

Solution:

Statement of Equivalent production of Process RT

Input units	Details	Output units	Equivalent Production			
			Material		Conversion cost	
			units	(%)	units	(%)
4,000	Opening WIP					
16,000	Introduced completed	14,400	14,400	100	14,400	100

	and transfer to next					
	Normal spoilage	1,440	--	--	--	--
	Abnormal Spoilage	1,160	1,160	100	1,160	100
	Closing WIP	3,000	3,000	100	2,000	66.67
20,000		20,000	18,560		17,560	

Statement showing Cost of each element

	Opening (`)	Cost in Process (`)	Total (`)	Equivalent Units	Cost per unit (`)
Materials	30,000	1,20,000	1,50,000	18,560	8.0819
Conversion cost	29,200	1,60,800	1,90,000	17,560	10.8200

Statement of Apportionment of cost

Completed Units	Material	14,400	8.0819	1,16,380
	Conversion cost	14,400	10.8200	1,55,808
				2,72,188
Closing stock	Material	3,000	8.0819	24,246
	Conversion cost	2,000	10.8200	21,640
				45,886
Abnormal Loss	Material	1,160	8.0819	9,375
	Conversion cost	1,160	10.8200	12,551
				21,926

Process-RT Account

Particulars	Units	Amount	Particulars	Units	Amount
To Opening WIP	4,000	59,200	By Normal Loss	1,440	--
To Material introduced	16,000	1,20,000	By Abnormal loss	1,160	21,926
To Conversion cost		1,60,800	By Transfer to next process	14,400	2,72,188
			By Closing WIP	3,000	45,886
	20,000	3,40,000		20,000	3,40,000

9.22 Cost Accounting

Question 8

JK Ltd. produces a product "AZE", which passes through two processes, viz., process I and process II. The output of each process is treated as the raw material of the next process to which it is transferred and output of the second process is transferred to finished stock. The following data related to December, 2013:

	Process I	Process II
25,000 units introduced at a cost of	₹ 2,00,000	—
Material consumed	₹ 1,92,000	₹ 96,020
Direct labour	₹ 2,24,000	₹ 1,28,000
Manufacturing expenses	₹ 1,40,000	₹ 60,000
Normal wastage of input	10%	10%
Scrap value of normal wastage (per unit)	₹ 9.90	₹ 8.60
Output in Units	22,000	20,000

Required:

- Prepare Process I and Process II account.
- Prepare Abnormal Gain/ Loss account as the case may be for each process.

Solution:

Process- I Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Input	25,000	2,00,000	By Normal wastage (2,500 units × ₹ 9.90)	2,500	24,750
To Material		1,92,000	By Abnormal loss A/c (500 units × ₹ 32.50)	500	16,250
To Direct Labour		2,24,000	By Process- II (22,000 units × ₹ 32.50)	22,000	7,15,000
To Manufacturing Exp.		1,40,000			
	25,000	7,56,000		25,000	7,56,000

$$\text{Cost per unit} = \frac{₹ 7,56,000 - ₹ 24,750}{25,000 \text{ units} - 2,500 \text{ units}} = ₹ 32.50 \text{ per unit}$$

Process- II Account

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Process- I	22,000	7,15,000	By Normal wastage (2,200 units × ` 8.60)	2,200	18,920
To Material		96,020	By Finished stock (20,000 units × ` 49.50)	20,000	9,90,000
To Direct Labour		1,28,000			
To Manufacturing Exp.		60,000			
To Abnormal Gain A/c (200 units × ` 49.50)	200	9,900			
	22,200	10,08,920		22,200	10,08,920

$$\text{Cost per unit} = \frac{`9,99,020 - `18,920}{22,000\text{units} - 2,200\text{units}} = ` 49.50 \text{ per unit}$$

Abnormal Loss Account

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Process- I A/c	500	16,250	By Cash (Sales) (500 units × ` 9.90)	500	4,950
			By Costing Profit and Loss A/c		11,300
	500	16,250		500	16,250

Abnormal Gain Account

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Normal wastage (200 units × ` 8.60)	200	1,720	By Process II A/c	200	9,900
To Costing Profit and Loss		8,180			
	200	9,900		200	9,900

9.24 Cost Accounting

Question 9

A product passes from Process I and Process II. Materials issued to Process I amounted to ₹ 40,000, Labour ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss was 3% of input as estimated. But 500 more units of output of Process I were lost due to the carelessness of workers. Only 4,350 units of output were transferred to Process II. There were no opening stocks. Input raw material issued to Process I were 5,000 units.

You are required to show Process I account.

Solution:

Process- I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material	5,000	40,000	By Normal loss*	150	–
To Labour		30,000	By Abnormal loss** (500 units × ₹ 20)	500	10,000
To Overhead		27,000	By Process II (4,350 units × ₹ 20)	4,350	87,000
	5,000	97,000		5,000	97,000

* 3% of input = 3% × 5,000 = 150 units

** $\frac{97,000}{(5,000 - 150)} = \frac{97,000}{4,850} = ₹ 20$ per unit.

Question 10

XP Ltd. furnishes you the following information relating to process II.

- (i) Opening work-in-progress – NIL
- (ii) Units introduced 42,000 units @ ₹ 12
- (iii) Expenses debited to the process:

		(₹)
Direct material	=	61,530
Labour	=	88,820
Overhead	=	1,76,400

- (iv) Normal loss in the process = 2 % of input.
- (v) Closing work-in-progress – 1,200 units
Degree of completion - Materials 100%
Labour 50%

Overhead 40%

(vi) Finished output – 39,500 units

(vii) Degree of completion of abnormal loss:

Material 100%

Labour 80%

Overhead 60%

(viii) Units scrapped as normal loss were sold at ` 4.50 per unit.

(ix) All the units of abnormal loss were sold at ` 9 per unit.

Prepare:

(a) Statement of equivalent production;

(b) Statement showing the cost of finished goods, abnormal loss and closing work-in-progress;

(c) Process II account and abnormal loss account.

Solution:

(a) **Statement of Equivalent Production**

Particulars	Output	Material		Labour		Overhead	
		Units	(%)	Units	(%)	Units	(%)
Finished Output	39,500	39,500	100	39,500	100	39,500	100
Normal Loss (2% of 42,000 units)	840	--	--	--	--	--	--
Abnormal Loss (42,000 – 39,500 – 840 – 1,200)	460	460	100	368	80	276	60
Closing W.I.P.	1,200	1,200	100	600	50	480	40
	42,000	41,160		40,468		40,256	

(b) **Statement of Cost** (`)

Units Introduced 42,000 units @ ` 12 per unit	5,04,000
Add: Material	<u>61,530</u>
	5,65,530
Less: Value of Normal Loss (840 units × ` 4.50)	<u>3,780</u>
	<u>5,61,750</u>

9.26 Cost Accounting

		Cost per Unit (`)
Material	<u>5,61,750</u> 41,160units	13.648
Labour	<u>88,820</u> 40,468units	2.195
Overhead	<u>1,76,400</u> 40,256units	4.382
		20.225

		Amount (`)
Abnormal Loss:		
Material	(460 units × ` 13.648)	6,278.08
Labour	(368 units × ` 2.195)	807.76
Overheads	(276 units × ` 4.382)	<u>1,209.42</u>
		<u>8,295.26</u>
Closing W.I.P:		
Material	(1,200 units × ` 13.648)	16,377.60
Labour	(600 units × ` 2.195)	1,317.00
Overheads	(480 units × ` 4.382)	<u>2,103.36</u>
		<u>19,797.96</u>
Finished Goods	(39,500 units × ` 20.225)	7,98,887.50

(c)

Process II Account

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Opening WIP	-	Nil	By Normal Loss	840	3,780
“ Input	42,000	5,04,000	“ Abnormal Loss	460	8,295
“ Direct Material	-	61,530	“ Finished Goods	39,500	7,98,877
“ Labour	-	88,820			
“ Overhead	-	1,76,400	“ Closing WIP	1,200	19,798
	42,000	8,30,750		42,000	8,30,750

Abnormal Loss Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process II	460	8,295	By Cash (460 units × ₹ 9)	460	4,140
			“ Costing P & L	--	4,155
	460	8,295		460	8,295

Question 11

Pharma Limited produces product 'Gluco-G' which passes through two processes before it is completed and transferred to finished stock. The following data relates to March, 2014:

	Process-I (₹)	Process-II (₹)	Finished Stock (₹)
Opening Stock	1,50,000	1,80,000	4,50,000
Direct materials	3,00,000	3,15,000	-
Direct Wages	2,24,000	2,25,000	-
Factory Overheads	2,10,000	90,000	-
Closing Stock	74,000	90,000	2,25,000
Inter process profit included in Opening stock	NIL	30,000	1,65,000

Output of process I is transferred to process II at 25 percent profit on the transfer price, whereas output of process II is transferred to finished stock at 20 percent on transfer price. Stock in processes are valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales for the month is ₹ 28,00,000.

You are required to prepare Process-I A/c, Process-II A/c, and Finished Stock A/c showing the profit element at each stage.

Solution:

Process- I A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Balance	1,50,000	1,50,000	-	By Transfer to Process II A/c	10,80,000	8,10,000	2,70,000
To Direct Material	3,00,000	3,00,000	-				

9.28 Cost Accounting

To Direct Wages	2,24,000	2,24,000	-				
	6,74,000	6,74,000	-				
Less: Closing Stock	74,000	74,000	-				
Prime Cost	6,00,000	6,00,000	-				
To Factory Overhead	2,10,000	2,10,000	-				
Total Cost:	8,10,000	8,10,000	-				
Profit 25% on transfer price i.e. $33\frac{1}{3}$ on total cost	2,70,000	-	2,70,000				
	10,80,000	8,10,000	2,70,000		10,80,000	8,10,000	2,70,000

Process- II A/c

Particulars	Total (`)	Cost (`)	Profit (`)	Particulars	Total (`)	Cost (`)	Profit (`)
To Opening Stock	1,80,000	1,50,000	30,000	By Transfer to Process II A/c	22,50,000	15,15,000	7,35,000
To Direct Material	3,15,000	3,15,000	-				
To Direct Wages	2,25,000	2,25,000	-				
To Transfer from Process I A/c	10,80,000	8,10,000	2,70,000				
Prime Cost	18,00,000	15,00,000	3,00,000				
Less: Closing Stock	90,000	75,000	15,000				
	17,10,000	14,25,000	2,85,000				
To Factory Overhead	90,000	90,000	-				
Total Cost:	18,00,000	15,15,000	2,85,000				
Profit 20% on transfer price i.e. 25% on cost	4,50,000	-	4,50,000				
	22,50,000	15,15,000	7,35,000		22,50,000	15,15,000	7,35,000

$$\text{Profit element in closing stock} = \frac{3,00,000}{18,00,000} \times 90,000 = 15,000$$

Finished Stock A/c

Particulars	Total (`)	Cost (`)	Profit (`)	Particulars	Total (`)	Cost (`)	Profit (`)
To Opening Stock	4,50,000	2,85,000	1,65,000	By Sales	28,00,000	16,48,500	11,51,500
To Transfer from Process-II	22,50,000	15,15,000	7,35,000				
	27,00,000	18,00,000	9,00,000				
Less: Closing Stock	2,25,000	1,51,500	73,500				
Total Cost	24,75,000	16,48,500	8,26,500				
Profit	3,25,000	-	3,25,000				
(Balancing Figure)							
	28,00,000	16,48,500	11,51,500		28,00,000	16,48,500	11,51,500

$$\text{Profit element in closing finished Stock} = \frac{7,35,000}{22,50,000} \times 2,25,000 = 73,500$$

Calculation of Profit on Sale

Process	Apparent Profit (`)	Add: Unrealised Profit in Opening Stock (`)	Less: Unrealised Profit in Closing Stock (`)	Actual Profit (`)
Process – I	2,70,000	--	--	2,70,000
Process – II	4,50,000	30,000	15,000	4,65,000
Finished Stock	3,25,000	1,65,000	73,500	4,16,500
	10,45,000	1,95,000	88,500	11,51,500

Question 12

Following information is available regarding Process A for the month of October 2013:

Production Record:

- | | |
|--|----------------|
| (i) Opening work-in progress
(Material: 100% complete, 25% complete for labour & overheads) | 40,000 Units |
| (ii) Units Introduced | 1,80,000 Units |
| (iii) Units Completed | 1,50,000 Units |

9.30 Cost Accounting

(iv) Units in-process on 31.10.2013	70,000 Units
(Material: 100% complete, 50% complete for labour & overheads)	
Cost Record:	(`)
Opening Work-in-progress:	
Material	1,00,000
Labour	25,000
Overheads	45,000
Cost incurred during the month:	
Material	6,60,000
Labour	5,55,000
Overheads	9,25,000

Assure that FIFO method is used for W.I.P. inventory valuation.

Required:

- (i) Statement of Equivalent Production
- (ii) Statement showing Cost for each element
- (iii) Statement of apportionment of Cost
- (iv) Process- A Account

Solution:

Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production			
Particulars	Units	Particulars	Units	Material		Labour & Overheads	
				(%)	Units	(%)	Units
Opening WIP	40,000	Transfer to Process II:					
Introduced	1,80,000	Opening WIP completed	40,000	--	--	75	30,000
		Introduced & completed	1,10,000	100	1,10,000	100	1,10,000
		Closing WIP	70,000	100	70,000	50	35,000
	2,20,000		2,20,000		1,80,000		1,75,000

Statement showing Cost for each element

Item of Cost	Equivalent Production	Cost Incurred (`)	Cost per Unit (`)
Material	1,80,000	6,60,000	3.66667
Labour & Overheads	1,75,000	14,80,000	8.45714
			12.12381

Statement of Apportionment of Cost

Transfer to Process II		
Opening WIP Completed		
Cost already Incurred ` (1,00,000 + 25,000 + 45,000)	1,70,000	
Cost Incurred during the Month		
Labour & Overheads (30,000 units × ` 8.45714)	2,53,714	4,23,714
Introduced & Completed (1,10,000 units × ` 12.12381)		13,33,619
		17,57,333
Closing WIP		
Material (70,000 units × ` 3.66667)	2,56,667	
Labour and Overheads (35,000 units × ` 8.45714)	<u>2,96,000</u>	5,52,667

Process- A A/c

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Opening WIP	40,000	1,70,000	By Process II A/c	1,50,000	17,57,333
To Materials	1,80,000	6,60,000	By Closing WIP	7,000	5,52,667
To Labour		5,55,000			
To Overheads		9,25,000			
	2,20,000	23,10,000		2,20,000	23,10,000

Question 13

The following details are available of Process X for August 2013:

(1)	Opening work-in-progress	8,000 units
	Degree of completion and cost:	
	Material (100%)	` 63,900
	Labour (60%)	` 10,800
	Overheads (60%)	` 5,400
(2)	Input 1,82,000 units at	` 7,56,900
(3)	Labour paid	` 3,28,000
(4)	Over heads incurred	` 1,64,000
(5)	Units scrapped	14,000
	Degree of completion:	
	Material	100%
	Labour and overhead	80%

9.32 Cost Accounting

(6)	Closing work-in-process	18000 units
	Degree of completion:	
	Material	100%
	Labour and overhead	70%
(7)	1,58,000 units were completed and transferred to next process.	
(8)	Normal loss is 8% of total input including opening work-in-process	
(9)	Scrap value is ₹ 8 per unit to be adjusted in direct material cost	

You are required to compute, assuming that average method of inventory is used:

- Equivalent production, and
- Cost per unit

Solution:

(i) **Statement of Equivalent Production**

Particulars	Units	Material		Labour and Overhead	
		(%)	Units	(%)	Units
Production units completed	1,58,000	100	1,58,000	100	1,58,000
Normal Loss 8% of (1,82,000 + 8,000)	15,200	--	--	--	--
Closing WIP	18,000	100	18,000	70	12,600
	1,91,200	--	1,76,000	--	1,70,600
Less : Abnormal Gain	1,200	100	1,200	100	1,200
Total	1,90,000		1,74,800		1,69,400

(ii) **Statement of cost**

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)
Opening WIP	63,900	10,800	5,400
Input of Materials	7,56,900	-	-
Expenses	-	3,28,000	1,64,000
Total	8,20,800	3,38,800	1,69,400
Less : Sale of Scrap (15,200 x ₹ 8)	1,21,600	-	-
Net cost	6,99,200	3,38,800	1,69,400
Equivalent Units	1,74,800	1,69,400	1,69,400
Cost Per Unit	₹ 4.00	₹ 2.00	₹ 1.00

Total cost per unit = ₹ (4+2+1) = ₹ 7.00

Question 14

A product passes through two processes A and B. During the year 2013, the input to process A of basic raw material was 8,000 units @ ₹ 9 per unit. Other information for the year is as follows:

	Process A	Process B
Output units	7,500	4,800
Normal loss (% to input)	5%	10%
Scrap value per unit (₹)	2	10
Direct wages (₹)	12,000	24,000
Direct expenses (₹)	6,000	5,000
Selling price per unit (₹)	15	25

Total overheads ₹ 17,400 were recovered as percentage of direct wages. Selling expenses were ₹ 5,000. These are not allocated to the processes. 2/3rd of the output of Process A was passed on to the next process and the balance was sold. The entire output of Process B was sold.

Prepare Process A and B Accounts.

Solution:

Process- A Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Input	8,000	72,000	By Normal Loss (5% of 8,000 units × ₹ 2)	400	800
To Direct Wages	--	12,000	By Abnormal loss (100 units × ₹ 12.50)	100	1,250
To Direct Exp.	--	6,000	By Process- B A/c (7,500 units × $\frac{2}{3}$ × ₹ 12.50)	5,000	62,500
To Overheads (₹ 17,400 × $\frac{1}{3}$)	--	5,800	By Profit and Loss A/c (7,500 units × $\frac{1}{3}$ × ₹ 12.50)	2,500	31,250
	8,000	95,800		8,000	95,800

$$\text{Cost per unit} = \frac{₹ 95,800 - ₹ 800}{8,000 \text{ units} - 400 \text{ units}} = \frac{₹ 95,000}{7,600 \text{ units}} = ₹ 12.50$$

Process- B Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	5,000	62,500	By Normal Loss (10% of 5,000 units × ₹ 10)	500	5,000

9.34 Cost Accounting

To Direct Wages	--	24,000	By Finished Stock A/c or Profit & loss A/c (4,800 units × ₹ 21.80)	4,800	1,04,640
To Direct Expenses	--	5,000			
To Overheads (₹ 17,400 × $\frac{2}{3}$)	--	11,600			
To Abnormal gain	300	6,540			
	5,300	1,09,640		5,300	1,09,640

$$\text{Cost per unit} = \frac{\text{₹ } 1,03,100 - \text{₹ } 5,000}{5,000 \text{ units} - 500 \text{ units}} = \frac{\text{₹ } 98,100}{4,500 \text{ units}} = \text{₹ } 21.80$$

Working

Profit & Loss A/c

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To Cost of Sales:			By Sales:		
Process A (2,500 units × ₹ 12.50)	31,250		Process A (2,500 units × ₹ 15)	37,500	
Process B (4,800 units × ₹ 21.80)	1,04,640	1,35,890	Process B (4,800 units × ₹ 25)	1,20,000	1,57,500
To Abnormal Loss:			By Abnormal gain:		
Process A [(100 units × ₹ (12.50-2))]		1,050	Process B [(300 units × ₹ (21.80-10))]		3,540
To Selling expenses		5,000			
To Net Profit		19,100			
		1,61,040			1,61,040

Note:

- As mentioned selling expenses are not allocable to process which is debited directly to the P/L A/c.
- It is assumed that Process A and Process B are not responsibility centres and hence, Process A and Process B have not been credited to direct sales. P/L A/c is prepared to arriving at profit/loss.

Question- 15

ABX Company Ltd. provides the following information relating to Process-B:

- (i) Opening Work-in-progress - NIL
 - (ii) Units Introduced - 45,000 units @ ` 10 per unit
 - (iii) Expenses debited to the process:
 - Direct material ` 65,500
 - Labour ` 90,800
 - Overhead ` 1,80,700
 - (iv) Normal loss in the process - 2% of Input
 - (v) Work-in progress - 1800 units
 - Degree of completion
 - Materials - 100%
 - Labour - 50%
 - Overhead - 40%
 - (vi) Finished output - 42,000 units
 - (vii) Degree of completion of abnormal loss:
 - Materials - 100%
 - Labour - 80%
 - Overhead - 60%
 - (viii) Units scrapped as normal loss were sold at ` 5 per unit.
 - (ix) All the units of abnormal loss were sold at ` 2 per unit.
- You are required to prepare:
- (a) Statement of equivalent production.
 - (b) Statement showing the cost of finished goods, abnormal loss and closing balance of work-in-progress.
 - (c) Process-B Account and Abnormal Loss account.

Solution

(a) Statement of Equivalent Production

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material		Labour		Overhead	
				%	Units	%	Units	%	Units
Unit Introduced	45,000	Finished output	42,000	100	42,000	100	42,000	100	42,000

9.36 Cost Accounting

		Normal loss (2% of 45,000)	900	-	-	-	-	-	-
		Abnormal loss	300	100	300	80	240	60	180
		Closing W-I-P	1,800	100	1,800	50	900	40	720
	45,000		45,000		44,100		43,140		42,900

(b) Statement of Cost

Particulars	Units	Rate (₹)	Amount (₹)	Amount (₹)
(i) Finished goods	42,000	17.9042		7,51,976.40
(ii) Abnormal Loss				
Material	300	11.5873	3,476.19	
Labour	240	2.1048	505.15	
Overhead	180	4.2121	758.18	4,739.52
(iii) Closing W-I-P:				
Material	1,800	11.5873	20,857.14	
Labour	900	2.1048	1,894.32	
Overhead	720	4.2121	<u>3,032.71</u>	25,784.17

Cost per Unit

Particulars	Amount (₹)	Units	Per Unit (₹)
(i) Direct Material :			
Unit Introduced	4,50,000		
Add: Material	<u>65,500</u>		
	5,15,500		
Less: Value of normal loss (900 units × ₹5)	<u>(4,500)</u>		
	5,11,000	44,100	11.5873
(ii) Labour	90,800	43,140	2.1048
(iii) Overhead	1,80,700	42,900	4.2121
			<u>17.9042</u>

(c) Process – B A/c

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Input	45,000	4,50,000	By Normal loss	900	4,500
To Direct Material	-	65,500	By Abnormal loss	300	4,740
To Labour	-	90,800	By Finished goods	42,000	7,51,976
To Overhead		1,80,700	By Closing W-I-P	1,800	25,784
	45,000	7,87,000		45,000	7,87,000

Abnormal Loss A/c

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Process-B A/c	300	4,740	By Cost ledger control A/c or Bank A/c	300	600
			By Costing Profit & loss A/c	-	4,140
	300	4,740		300	4,740

Question- 16

M J Pvt. Ltd. produces a product "SKY" which passes through two processes, viz. Process-A and Process-B. The details for the year ending 31st March, 2014 are as follows:

	Process A	Process - B
40,000 Units introduced at a cost of	₹ 3,60,000	-
Material Consumed	₹ 2,42,000	2,25,000
Direct Wages	₹ 2,58,000	1,90,000
Manufacturing Expenses	₹ 1,96,000	1,23,720
Output in Units	37,000	27,000
Normal Wastage of Input	5%	10%
Scrap Value (per unit)	₹ 15	20
Selling Price (per unit)	₹ 37	61

Additional Information:

- 80% of the output of Process-A, was passed on to the next process and the balance was sold. The entire output of Process- B was sold.
- Indirect expenses for the year was ₹ 4,48,080.
- It is assumed that Process-A and Process-B are not responsibility centre.

9.38 Cost Accounting

Required:

- (i) Prepare Process-A and Process-B Account.
- (ii) Prepare Profit & Loss Account showing the net profit / net loss for the year.

Solution:

(i) Process- A Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Input	40,000	3,60,000	By Normal wastage (2,000 units × ₹ 15)	2,000	30,000
To Material	---	2,42,000	By Abnormal loss A/c (1,000 units × ₹ 27)	1,000	27,000
To Direct wages	---	2,58,000	By Process- B (29,600 units × ₹ 27)	29,600	7,99,200
To Manufacturing Exp.	---	1,96,000	By Profit & Loss A/c (7,400 units × ₹ 27)	7,400	1,99,800
	40,000	10,56,000		40,000	10,56,000

$$\text{Cost per unit} = \frac{₹ 10,56,000 - ₹ 30,000}{40,000 \text{ units} - 2,000 \text{ units}} = ₹ 27 \text{ per unit}$$

$$\text{Normal wastage} = 40,000 \text{ units} \times 5\% = 2,000 \text{ units}$$

$$\text{Abnormal loss} = 40,000 \text{ units} - (37,000 \text{ units} + 2,000 \text{ units}) = 1,000 \text{ units}$$

$$\text{Transfer to Process- B} = 37,000 \text{ units} \times 80\% = 29,600 \text{ units}$$

$$\text{Sale} = 37,000 \text{ units} \times 20\% = 7,400 \text{ units}$$

Process- B Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	29,600	7,99,200	By Normal wastage (2,960 units × ₹ 20)	2,960	59,200
To Material	---	2,25,000	By Profit & Loss A/c (27,000 units × ₹ 48)	27,000	12,96,000
To Direct Wages	---	1,90,000			
To Manufacturing Exp.	---	1,23,720			

To Abnormal Gain A/c (360 units × ₹ 48)	360	17,280			
	29,960	13,55,200		29,960	13,55,200

$$\text{Cost per unit} = \frac{₹ 13,37,920 - ₹ 59,200}{29,600 \text{ units} - 2,960 \text{ units}} = ₹ 48 \text{ per unit}$$

$$\text{Normal wastage} = 29,600 \text{ units} \times 10\% = 2,960 \text{ units}$$

$$\text{Abnormal gain} = (27,000 \text{ units} + 2,960 \text{ units}) - 29,600 \text{ units} = 360 \text{ units}$$

(ii) **Profit & Loss Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Process- A A/c	1,99,800	By Sales:	
To Process- B A/c	12,96,000	- Process-A (7,400 units × ₹ 37)	2,73,800
To Abnormal loss A/c	12,000	- Process- B (27,000 units × ₹ 61)	16,47,000
To Indirect Expenses	4,48,080	By Abnormal gain	10,080
		By Net loss	25,000
	19,55,880		19,55,880

Working Notes:

Normal wastage (Loss) Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	2,000	30,000	By Abnormal Gain A/c (360 units × ₹ 20)	360	7,200
To Process- B A/c	2,960	59,200	By Bank (Sales)	4,600	82,000
	4,960	89,200		4,960	89,200

Abnormal Loss Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	1,000	27,000	By Bank A/c (1,000 units × ₹ 15)	1,000	15,000
			By Profit & Loss A/c	---	12,000
	1,000	27,000		1,000	27,000

9.40 Cost Accounting

Abnormal Gain Account

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Normal loss A/c (360 units × ` 20)	360	7,200	By Process- B A/c	360	17,280
To Profit & Loss A/c		10,080			
	360	17,280		360	17,280

Question- 17

The following information relate to Process A:

(i)	Opening Work-in-Progress	8,000 units at ` 75,000
	Degree of Completion: Material	100%
	Labour and Overhead	60%
(ii)	Input 1,82,000 units at	` 7,37,500
(iii)	Wages paid	3,40,600
(iv)	Overheads paid	1,70,300
(v)	Units scrapped	14,000
	Degree of Completion: Material	100 %
	Wages and Overheads	80%
(vi)	Closing Work - in- Progress	18,000 units
	Degree of Completion: Material	100%
	Wages and Overheads	70%
(vii)	Units completed and 1,58,000 to next process	
(viii)	Normal loss 5% of total input including opening WIP	
(ix)	Scrap value is ` 5 per unit to be adjusted out of direct material cost	

You are required to compute on the basis of FIFO

- (i) Equivalent Production
- (ii) Cost Per Unit
- (iii) Value of Units transferred to next process.

Solution:

(i) **Statement of Equivalent Production
(FIFO Method)**

Input		Output		Equivalent Production			
Particulars	Units	Particulars	Units	Material		Labour & Overheads	
				(%)	Units	(%)	Units
Opening WIP	8,000	Transfer to next Process :					
Introduced	1,82,000	Opening WIP completed	8,000	--	--	40	3,200
		Introduced & completed	1,50,000	100	1,50,000	100	1,50,000
		Normal loss 5% (8,000 + 182,000)	9,500	--	--	--	--
		Abnormal loss	4,500	100	4,500	80	3,600
		Closing WIP	18,000	100	18,000	70	12,600
	1,90,000		1,90,000		1,72,500		1,69,400

(ii) **Computation of Cost per unit**

Particulars	Materials (`)	Labour (`)	Overhead (`)
Input of Materials	7,37,500	--	--
Expenses	--	3,40,600	1,70,300
Total	7,37,500	3,40,600	1,70,300
Less : Sale of Scrap (9,500 units x ` 5)	(47,500)	--	--
Net cost	6,90,000	3,40,600	1,70,300
Equivalent Units	1,72,500	1,69,400	1,69,400
Cost Per Unit	4.0000	2.0106	1.0053

Total cost per unit = ` (4.0000 + 2.0106 + 1.0053) = ` 7.0159

(iii) **Value of units transferred to next process:**

	Amount (`)	Amount (`)
Opening W-I-P	75,000	
Add: Labour (3,200 units x ` 2.0106)	6,434	
Overhead (3,200 units x ` 1.0053)	3,217	84,651
New introduced (1,50,000 units x ` 7.0159)		10,52,385
		11,37,036

9.42 Cost Accounting

Question- 18

The following information is furnished by ABC Company for Process - II of its manufacturing activity for the month of April 2015:

- (i) Opening Work-in-Progress - Nil
- (ii) Units transferred from Process I – 55,000 units at ` 3,27,800
- (iii) Expenditure debited to Process – II:
 - Consumables ` 1,57,200
 - Labour ` 1,04,000
 - Overhead ` 52,000
- (iv) Units transferred to Process III – 51,000 units
- (v) Closing WIP – 2,000 units (Degree of completion):
 - Consumables 80%
 - Labour 60%
 - Overhead 60%
- (vi) Units scrapped - 2,000 units, scrapped units were sold at ` 5 per unit
- (vii) Normal loss – 4% of units introduced

You are required to:

- (i) Prepare a Statement of Equivalent Production.
- (ii) Determine the cost per unit
- (iii) Determine the value of Work-in-Process and units transferred to Process – III

Solution:

(i) Statement of Equivalent Production

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material- A*		Consumables		Labour & Overheads	
				%	Units	%	Units	%	Units
Units transferred from Process-I	55,000	Units transferred to Process-III	51,000	100	51,000	100	51,000	100	51,000
		Normal loss (4% of 55,000)	2,200	-	-	-	-	-	-
		Closing W-I-P	2,000	100	2,000	80	1,600	60	1,200
		Abnormal Gain	(200)	100	(200)	100	(200)	100	(200)
	55,000		55,000		52,800		52,400		52,000

*Material A represent transferred-in units from process-I

(ii) Determination of Cost per Unit

Particulars	Amount (₹)	Units	Per Unit (₹)
(i) Direct Material (Consumables) :			
Value of units transferred from Process-I	3,27,800		
Less: Value of normal loss (2,200 units × ₹ 5)	(11,000)		
	3,16,800	52,800	6.00
(ii) Consumables added in Process-II	1,57,200	52,400	3.00
(iii) Labour	1,04,000	52,000	2.00
(iii) Overhead	52,000	52,000	1.00
Total Cost per equivalent unit			12.00

(iii) Determination of value of Work-in-Process and units transferred to Process-III

Particulars	Units	Rate (₹)	Amount (₹)
Value of Closing W-I-P:			
Material from Process-I	2,000	6.00	12,000
Consumables	1,600	3.00	4,800
Labour	1,200	2.00	2,400
Overhead	1,200	1.00	1,200
			20,400
Value of units transferred to Process-III	51,000	12.00	6,12,000

Question- 19

Star Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes and the company uses a FIFO process costing system to value work-in-process and finished goods. At the end of the last month, a fire occurred in the factory and destroyed some of the paper files containing records of the process operations for the month.

Star Ltd. needs your help to prepare the process accounts for the month during which the fire occurred. You have been able to gather some information about the month's operating activities but some of the information could not be retrieved due to the damage. The following information was salvaged:

- Opening work-in-process at the beginning of the month was 800 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 26,640.
- Closing work-in-process at the end of the month was 160 litres, 30% complete for labour and 20% complete for overheads.

9.44 Cost Accounting

- Normal loss is 10% of input and total losses during the month were 1,800 litres partly due to the fire damage.
- Output sent to finished goods warehouse was 4,200 litres.
- Losses have a scrap value of ₹15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹39 for the month made up as follows:

	(₹)
Raw Material	23
Labour	7
Overheads	9
	39

Required:

- Calculate the quantity (in litres) of raw material inputs during the month.
- Calculate the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.
- Calculate the values of raw material, labour and overheads added to the process during the month.
- Prepare the process account for the month.

Solution:

- Calculation of Raw Material inputs during the month:**

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	800	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,360	Process Losses	1,800
		Closing WIP	160
	6,160		6,160

- Calculation of Normal Loss and Abnormal Loss/Gain**

	Litres
Total process losses for month	1,800
Normal Loss (10% input)	536
Abnormal Loss (balancing figure)	1,264

- (c) Calculation of values of Raw Material, Labour and Overheads added to the process:

	Material	Labour	Overheads
Cost per equivalent unit	₹ 23.00	₹ 7.00	₹ 9.00
Equivalent units (litre) (refer the working note)	4,824	4,952	5,016
Cost of equivalent units	₹ 1,10,952	₹ 34,664	₹ 45,144
Add: Scrap value of normal loss (536 units × ₹ 15)	₹ 8,040	--	--
Total value added	₹ 1,18,992	₹ 34,664	₹ 45,144

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	800	Units completed:							
Units introduced	5,360	- Opening WIP	800	--	--	240	30	320	40
		- Fresh inputs	3,400	3,400	100	3,400	100	3,400	100
		Normal loss	536	--	--	--	--	--	--
		Abnormal loss	1,264	1,264	100	1,264	100	1,264	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,824		4,952		5,016	

- (d) Process Account for Month

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	800	26,640	By Finished goods	4,200	1,63,800
To Raw Materials	5,360	1,18,992	By Normal loss	536	8,040
To Wages	--	34,664	By Abnormal loss	1,264	49,296
To Overheads	--	45,144	By Closing WIP	160	4,304
	6,160	2,25,440		6,160	2,25,440