8. PROCESS AND OPERATION COSTING

NO. OF PROBLEMS IN 40.5E OF CA INTER: CLASSROOM - 12, ASSIGNMENT - 16

NO. OF PROBLEMS IN 41E OF CA INTER: CLASSROOM - 15, ASSIGNMENT - 19

NO. OF PROBLEMS IN 41.5E OF CA INTER: CLASSROOM - 10, ASSIGNMENT - 19

MODEL WISE ANALYSIS OF PAST EXAM PAPERS OF IPCC AND CA INTER

No.	MODEL NAME	M-11	N-11	M-12	N-12	M-13	N-13	M-14	N-14	M-15	N-15	M-16	N-16	M-17	N-17	M-18(O)	M-18(N)	N-18(O)	N-18(N)
1.	Preparation of Process Accounts	-	-	8	-	-	-	8	-	-	-	-	-	-	-	-	10	-	-
2.	Equivalent units	-		-	-	8	-	-	-	-	8	-	-	-	-	-	-	-	-
3.	Process Account with FIFO Method	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	8	5
4.	Process Account with Average Method	-	8	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-
5.	Process Account with LIFO Method	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.	Process Account with two material concepts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.	Inter-Process Profits	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-

SIGNIFICANCE OF EACH PROBLEM COVERED IN THIS MATERIAL

Problem No. in this material	Problem No. in NEW SM	Problem No. in OLD SM	Problem No. in OLD PM	RTP	MTP	Previous Exams	Remarks
CR 1	ILL 2	ILL 2	-	-	-	-	
CR 2	-	-	-	-	-	M18 (N)	
CR 3	-	-	-	-	-	-	
CR 4	-	-	16	-	-	M 14	
CR 5	-	-	15	-	-	M 13	
CR 6	-	-	-	-	M16	-	
CR 7	ILL-4	-	-	-	-	-	
CR 8	-	-	-	-	-	N18 (O)	
CR 9	-	-	-	-	-	N18 (N)	
CR 10	PQ 1	ILL 7	1	-	-	-	
CR 11	-	-	-	-	-	M18 (O)	
CR 12	-	ILL 5	-	-	-	-	
CR 13	-	-	2	M 16	-	-	
CR 14	-	-	-	-	-	M 17	
CR-15	-	-	-	-	-	M 16	
ASG 1	ILL 1	ILL 1	-	-	-	-	
ASG 2	-	-	-	-	-	-	
ASG 3	-	-	8	-	-	-	
ASG 4	ILL 3	ILL 3	-	-	-	-	
ASG 5	-	-	10	-	-	-	
ASG 6	-	-	-	-	-	N 15	
ASG 7	-	-	-	N 16	-	-	
ASG 8	-	ILL 4	-	N15, M18	-	-	
ASG 9	-	-	17	-	N18	N 14	
ASG 10	-	-	-	N 17	-	-	
ASG 11	-	-	12	-	-	-	
ASG 12	-	-	-	-	N15	-	
ASG 13	-	-	7	-	-	-	
ASG 14	PQ 2	ILL 8	5	-	-	-	
ASG 15	-	-	13	-	-	N 11	
ASG 16	-	-	-	M 14	-	-	
ASG 17	-	-	-	N18 (N&O), N13	N14	-	
ASG 18	-	-	-	-	N15	-	
ASG 19	ILL 6	ILL 10	-	-	-	-	

MEANING OF PROCESS COSTING: Process Costing is a method of costing used in industries where the material has to pass through two or more processes for being converted into a final product. It is defined as "a method of Cost Accounting whereby costs are charged to processes or operations and averaged over units produced". A separate account for each process is opened and all expenditure pertaining to a process is charged to that process account. Such type of costing method is useful in the manufacturing of products like steel, paper, medicines, soaps, chemicals, rubber, vegetable oil, paints, varnish etc. where the production process is continuous and the output of one process becomes the input of the following process till completion.

Basic features: Industries, where process costing can be applied, have normally one or more of the following features:

i) Each plant or factory is divided into a number of processes, cost centres or departments, and each such division is a stage of production or a process.

ii) Manufacturing activity is carried on continuously by means of one or more process runs sequentially, selectively or simultaneously.

iii) The output of one process becomes the input of another process.

iv) The end product usually is of like units not distinguishable from one another.

v) It is not possible to trace the identity of any particular lot of output to any lot of input materials. For example, in the sugar industry, it is impossible to trace any lot of sugar bags to a particular lot of sugarcane fed or vice versa.

vi) Production of a product may give rise to Joint and/or By-Products.

Costing Procedure: The Cost of each process comprises the cost of:

(i) Materials (ii) Labour (iii) Direct expenses, and (iv) Overheads of production.

Materials: Materials and supplies which are required for each process are drawn against material requisitions from stores. Each process for which the above drawn materials will be used should be debited with the cost of materials consumed on the basis of the information received from the Cost Accounting department. The finished product of first process generally become the raw materials of second process; under such a situation the account of second process, be debited with the cost of transfer from the first process and the cost of any additional material required under this second process.

Labour: Each process account should be debited with the labour cost or wages paid to labour for carrying out the processing activities. Sometimes the wages paid are apportioned over the different processes after selecting appropriate basis.

Direct expenses- Each process account should be debited with direct expenses like depreciation, repairs, maintenance, insurance etc. associated with it.

Overheads of production - Expenses like rent, power expenses, lighting bills, gas and water bills etc. are known as production overheads. These expenses cannot be allocated to a process. The suitable way out to recover them is to apportion them over different processes by using suitable basis. Usually, these expenses are estimated in advance and the processes debited with these expenses on a pre-determined basis.

Treatment of Normal Process Loss, Abnormal Process Loss and Abnormal Gain in Cost Accounting: Loss of material is inherent during processing operation. The loss of material under different processes arises due to reasons like evaporation or a change in the moisture content etc. Process loss is defined as the loss of material arising during the course of a processing operation and is equal to the difference between the input quantity of the material and its output.

There are two types of material losses viz. (i) Normal loss and (ii) Abnormal loss.

Normal Process Loss: It is defined as the loss of material which is inherent in the nature of work. Such a loss can be reasonably anticipated from the nature of the material, nature of operation, the experience and technical data. It is unavoidable because of nature of the material or the process. It also includes units withdrawn from the process for test or sampling.

Treatment in Cost Accounts: The cost of normal process loss in practice 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: It is defined as the loss in excess of the pre-determined loss (Normal process loss). This type of loss may occur due to the carelessness of workers, a bad plant design or operation, sabotage etc. Such a loss cannot obviously be estimated in advance. But it can be kept under control by taking suitable measures.

Treatment in Cost Accounts: The cost of an abnormal process loss unit is equal to the cost of a good unit. The total cost of abnormal process loss is credited to the process account from which it arises. Cost of abnormal process loss is not treated as a part of the cost of the product. In fact, the total cost of abnormal process loss is debited to costing profit and loss account.

Abnormal Process Gain: Sometimes, loss under a process is less than the anticipated normal figure. In other words, the actual production exceeds the expected figures. Under such a situation the difference between actual and expected loss or actual and expected production is known as abnormal gain. So abnormal gain may be defined as an unexpected gain in production under the normal conditions.

Treatment in Cost Accounts: 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. The cost of abnormal gain is computed on the basis of normal production.

Costing of Equivalent Production Units: In the case of process type of industries, it is possible to determine the average cost per unit by dividing the total cost incurred during a given period of time by the total number of units produced during the same period. But this is hardly the case in most of the process type industries where manufacturing is a continuous activity. The reason is that the cost incurred in such industries represents the cost of work carried on opening work-in-progress, closing work-in-progress and completed units. Thus to ascertain the cost of each completed unit it is necessary to ascertain the cost of work-in-progress in the beginning and at the end of the process.

The valuation of work-in-progress presents a good deal of difficulty because it has units under different stages of completion from those in which work has just begun to those which are only a step short of completion. Work-in-progress can be valued on actual basis, i.e., materials used on the unfinished units and the actual amount of labour expenses involved. However, the degree of accuracy in such a case cannot be satisfactory. An alternative method is based on converting partly finished units into equivalent finished units.

Equivalent production means converting the incomplete production units into their equivalent completed units. Under each process, an estimate is made of the percentage completion of work-in-progress with regard to different elements of costs, viz., material, labour and overheads. It is important that the estimate of percentage of completion should be as accurate as possible. The formula for computing equivalent completed units is:

$$\text{Equivalent completed units} = \left(\begin{array}{c}\text{Actual number of units in}\\ \text{the process of manufacture}\end{array}\right) \times \left(\text{percentage of work completed}\right)$$

For instance, if 25% of work has been done on the average of units still under process, then 200 such units will be equal to 50 completed units and the cost of work-in-progress will be equal to the cost of 50 finished units.

Valuation of work-in-progress: For the valuation of work-in-progress following three methods are available:

1. First-in-First Out (FIFO) method.

2. Last-in-First Out (LIFO) method.

3. Average Cost method (or weighted average cost method).

1. **First-in-first-out 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 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.

Complete cost of such units plus cost of units completely processed constitute the total cost of units transferred. In this method the closing stock of Work in progress is valued at current cost.

2. **Last-in first-out 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.

3. **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.

   The main difference between FIFO method and average method is that units of opening work in progress and their cost are taken in full under average method while under FIFO method only the remaining work done now is considered.

FORMULAS:

1. Actual loss = Input - Actual Output

2. Actual Output = Input - Actual loss

3. % of Actual loss = $\left(\dfrac{\text{Actual loss}}{\text{Input}} \right)$

4. Normal output / expected production = Input - normal loss

5. Abnormal loss = Actual Loss - Normal Loss (or)

   = Normal / expected production - Actual output

6. Abnormal gain = Normal Loss - Actual Loss (or)

   = Actual output - Normal / expected production

7. Actual loss = Normal loss + Abnormal loss (or)

   = Normal loss - Abnormal gain

8. Cost per unit = $\left(\dfrac{\text{Total cost} - \text{Scrap value of normal loss}}{\text{Input - normal loss units}} \right)$

9. Cost per unit of Abnormal loss (gain) and units transferred to next process is same.

10. Actual loss = Input x % of Actual Loss (or) Input - Actual output

11. Normal Loss = Input x % of normal loss

12. % of normal loss = $\left(\dfrac{\text{Normal loss}}{\text{Input}} \right)$

13. Abnormal loss to be transferred to costing P&L a/c = Abnormal loss (Abnormal loss in units X cost per unit) - Scrap value of abnormal loss units

14. Abnormal gain to be transferred to costing P&L a/c = Abnormal gain (Abnormal gain in units X cost per unit) - Scrap value of abnormal gain units

15. Equivalent units = No. of units X Degree of completion.

RULES FOR PREPARING PROCESS A/C'S

1. If closing WIP is given - Calculate equivalent units.

2. If opening WIP is given - Use FIFO/LIFO/Average. (If nothing is mentioned - use average).

3. If 2 processes were given: Use the concept of 2 materials. (generally under FIFO method)

4. DOC for Opening WIP, represents the work done during the previous month.

5. DOC for Closing WIP, represents the work done during this month.

6. The DOC for Normal Loss should always be taken as 0%.

7. The DOC for Abnormal Loss is as per the problem, otherwise it should be taken as 100%.

8. The DOC for Abnormal Gain should always be taken as 100%.

PROBLEMS FOR CLASSROOM DISCUSSION

MODEL 1: PREPARATION OF PROCESS ACCOUNTS

PROBLEM 1: A product passes through three processes. The output of each process is treated as the raw material of the next process to which it is transferred and output of the third process is transferred to finished stock.

	1st Process (Rs.)	2nd Process (Rs.)	3rd Process (Rs.)
Materials issued	40,000	20,000	10,000
Labour	6,000	4,000	1,000
Manufacturing overhead	10,000	10,000	15,000

10,000 units have been issued to the 1st process and after processing, the output of each process is as under:

	Output	Normal Loss
1st Process	9,750 units	2%
2nd Process	9,400 units	5%
3rd Process	8,000 units	10%

No stock of materials or of work-in-progress was left at the end. Calculate the cost of the finished articles.

(B) (OLD SM, NEW SM) (ANS.: COST PER UNIT -5.7142; 9.6862; 13.8358)

(SOLVE PROBLEM NO 1 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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PROBLEM 2: Alpha Ltd. is engaged in the production of a product A which passes through 3 different process - Process P, Process Q, P, Process R. The following data relating to cost and output is obtained from the books of accounts for the month of April 2017:

Particulars	Process P	Process Q	Process R
Direct Material	38,000	42,500	42,880
Direct Labour	30,000	40,000	50,000

Production overheads of Rs. 90,000 were recovered as percentage of direct labour.

10,000 kgs. of raw material @ Rs. 5 per kg. was issued to Process P. There was no stock of raw materials or work-in-progress. The entire output of each process passes directly to the next process and finally to warehouse. There is normal wastage, in processing, of 10%. The scrap value of wastage is Rs. 1 per kg. The output of each process transferred to next process and finally to warehouse are as under:

Process P = 9,000 kgs.

Process Q = 8,200 Kgs.

Process R = 7,300 Kgs.

The company fixes selling price of end product in such a way so as to yield a profit of 25% on selling price.

Prepare Process P, Q and R accounts. Also calculate selling price per unit of end product.

(A) (M18 (N) - 5M) (ANS.: COST PER UNIT = RS.15.50, RS.31, RS.52)

(SOLVE PROBLEM NO 2 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

PROBLEM 3: A product passes through three processes A, B and C. 10,000 units at a cost of Rs.1.00 each were issued to process A. The other expenses are:

Item	Process A	Process B	Process C
Direct Materials	1,000	1,500	1,480
Direct Labour	5,000	8,000	6,500
Direct Expenses	1,050	1,188	1,605

The wastage in process 'A' was 5% and in process 'B' 4%. The wastage of process A was sold at Re 0.25 per unit and that of 'B' at Rs.0.50 per unit and that of 'C' at Rs.1.00 per unit. The overhead charges were 168% of direct labour. The final product was sold at Rs.10 per unit fetching a profit of 20% on sales. Find the percentage of wastage in process 'C'.   *(B) (ANS.: % OF WASTAGE - 5%)*

Note:_____

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PROBLEM 4:(PRINTED SOLUTION AVAILABLE) 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	Rs. 3,60,000	-
Material Consumed	Rs.2,42,000	2,25,000
Direct Wages	Rs.2,58,000	1,90,000
Manufacturing Expenses	Rs.1,96,000	1,23,720
Output in Units	37,000	27,000
Normal Wastage of Input	5%	10%
Scrap Value (per unit)	Rs.15	20
Selling Price (per unit)	Rs.37	61

Additional Information:

a) 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.

b) Indirect expenses for the year was Rs.4,48,080.

c) It is assumed that Process-A and Process-B are not responsibility centre.

Required:

i) Prepare Process-A and Process-B Account.

ii) Prepare Profit & Loss Account showing the net profit I net loss for the year.

(A) (OLD PM, M14 - 8M) (ANS.: (I) COST PER UNIT = RS.27; RS.48 (II) NET LOSS = 25,000)

(SOLVE PROBLEM NO 3, 4 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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MODEL 2: EQUIVALENT UNITS

PROBLEM 5: ABX Company Ltd. provides the following information relating to Process - B:

i) Opening Work-in-progress	- NIL
ii) Units Introduced	- 45,000 units @ Rs. 10 per unit
iii) Expenses debited to the process: Direct material Labour Overhead	 Rs. 65,500 Rs. 90,800 Rs. 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 Rs. 5 per unit.	
ix) All the units of abnormal loss were sold at Rs. 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.   *(A) (OLD PM, M13 - 10M)*

(ANS.: FG - 7,51,976, CLOSING WIP - 25,784) (SOLVE PROBLEM NO 5 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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PROBLEM 6: (PRINTED SOLUTION AVAILABLE) Aditya Agro Ltd. mixes powdered ingredients in two different processes to produce one product. The output of Process- I becomes the input of Process-II and the output of Process-II is transferred to the Packing department.

From the information given below, you are required to open accounts for Process-I, Process-II and Abnormal loss/ gain A/c to record the transactions for the month of February 2016.

Process - I

Input	
Material A	6,000 kilograms at Rs. 50 per kilogram
Material B	4,000 kilograms at Rs. 100 per kilogram
Labour	430 hours at Rs. 50 per hour
Normal loss	5% of inputs. Scrap are disposed off at Rs. 16 per kilogram
Output	9,200 kilograms.

There is no work- in- process at the beginning or end of the month.

Process - II

Input	
Material C	6,600 kilograms at Rs. 125 per kilogram
Material D	4,200 kilograms at Rs. 75 per kilogram
Flavoring Essence	Rs. 3,300
Labour	370 hours at Rs.50 per hour
Normal loss	5% of inputs with no disposal value
Output	18,000 kilograms.

There is no work-in-process at the beginning of the month but 1,000 kilograms in process at the end of the month and estimated to be only 50% complete so far as labour and overhead were concerned.

Overhead of Rs. 92,000 incurred to be absorbed on the basis of labour hours.

(B) (MTP M16) (ANS: PROCESS I - 7,70,950; PROCESS II - 19,43,207; ABNORMAL LOSS - 24,093)

(SOLVE PROBLEM NO 6, 7 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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MODEL 3: PROCESS ACCOUNT WITH FIFO METHOD

PROBLEM 7: Opening work-in-process 1,000 units (60% complete); Cost Rs.1,10,000. Units introduced during the period 10,000 units; Cost Rs.19,30,000. Transferred to next process - 9,000 units.

Closing work-in-process - 800 units (75% complete). Normal loss is estimated at 10% of total input including units in process at the beginning. Scraps realise Rs.10 per unit. Scraps are 100% complete.

Using FIFO method, compute equivalent production and cost per equivalent unit. Also evaluate the output.

(A) (NEW SM) (ANS.: UNDER FIFO - TOTAL PROCESS COST: RS. 19,19,000, 9,100 UNITS COST PER EQUIVALENT UNIT: 210.88)

Note:_____

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PROBLEM 8: A Company manufacturing chemical solution that passes through a number of processes uses FIFO method to value Work-in-Process and Finished Goods. At the end of month of September, a fire occurred in the factory and some papers containing records of the process operations for the month were destroyed. The Company desires to prepare process accounts for the month during which the fire occurred. Some information could be gathered as to operating activities as under:

Opening Work-in-Process at the beginning of 1,100 litres-40% complete for labour and 60% complete for Overheads.

Opening Work-in-Process was valued at Rs.48,260.

Closing Work-in-Process at the end of the month was 220 litres, 40% complete for Labour and 30% complete for Overheads. Normal loss is 10% of input and total losses during the month were 2,200 litres partly due to fire damage. Assume degree of completion of abnormal losses is 100%.

Output sent to Finished Goods Warehouse was 5,900 litres.

Losses have a scrap value of Rs.20 per litre.

All Raw Materials are added at the commencement of the process.

The Cost per equivalent Unit (litre) is Rs.53 for the month consisting:

Raw Material (in Rs.)	35
Labour (in Rs.)	8
Overheads (in Rs.)	10
Total (in Rs.)	53

You are required to:

a) Calculate the quantity (in litres) of Raw Material input during the month.

b) Calculate the quantity (in litres) of Normal Loss and Abnormal loss/Gain experienced in the month.

(A) (N18 (O) - 8M)

(SOLVE PROBLEM NO 8, 9 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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PROBLEM 9: Following details have been provided by M/s AR Enterprises:

i) Opening works-in-progress: 3,000 units (70% complete)

ii) Units introduced during the year: 17,000 units

iii) Cost of the process (for the period): Rs.33,12,720

iv) Transferred to next process: Rs. 15,000 units

v) Closing works-in-progress: 2,200 units (80% complete)

vi) Normal loss is estimated at 12% of total input (including units in process in the beginning). Scraps realise Rs.50 per unit. scraps are 100% complete.

Using FIFO method, compute:

a) Equivalent production

b) Cost per equivalent unit   *(A) (N18 (N) - 5M)*

(SOLVE PROBLEM NO 10, 11, 12 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

MODEL 4: PROCESS ACCOUNT WITH AVERAGE METHOD

PROBLEM 10: Following information is available regarding process A for the month of February, 2014:

Production Record:

Units in process as on 1.2.2014(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 28.2.2014 (All materials used, 33-1/3% complete for labour and overhead)	6,000

Cost Records:

Work-in-process as on 1.2.2014	(Rs.)
Materials	6,000
Labour	1,000
Overhead	1,000
Total	8,000
Cost during the month	(Rs.)
Materials	25,600
Labour	15,000
Overhead	15,000
Total	55,600

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.

(A) (NEW SM, OLD SM, OLD PM) (ANS.: I. 20,000, 16,000, 16,000 EQUIVALENT UNITS, II. MATERIAL RS.1.58, LABOUR = RS.1, OVERHEAD = RS.1, III. VALUE OF UNITS TRANSFERRED 50,120, VALUE OF CLOSING WORKING PROGRESS 13,480)

(SOLVE PROBLEM NO 13, 14 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

PROBLEM 11: ABC ltd. produces an item which is completed in three processes - X, Y and Z. The following information is furnished for process X for the month of March 2018:

	(Rs.)
Opening work-in progress (5,000 units):	
Materials	35,000
Labour	13,000
Overheads	25,000
Units introduced into Process-X (55,000 units) :	
Materials	20,20,000

Labour	8,00,000
Overheads	13,30,000
Units scrapped : 5,000 units	
Degree of completion :	
Materials	100%
Labour & overheads	60%
Closing work-in progress : 5,000 units	
Degree of completion :	
Material	100%
Labour & overheads	60%
Units finished and transferred to Process-Y : 50,000 units	
Normal Loss: 5% of total input (including opening work-in-progress.) Scrapped units fetch Rs.20 per unit.	

Presuming that average method of inventory is used, prepare

i) Statement of equivalent production

ii) Statement of cost for each element

iii) Statement of distribution of cost

iv) Abnormal Loss Account. *(A) (M18(O) - 8M) (SOLVE PROBLEM NO 15, 16 OF ASSIGNMENT PROBLEMS AS REWORK)*

Note:_____

MODEL 5: PROCESS ACCOUNT WITH LIFO METHOD

PROBLEM 12: From the following information relating to the month of April 15, calculate the equivalent production units and the value of finished production and work-in-progress, using the LIFO method. Opening work-in-progress on 1st April 2,000 units; 50% complete.

Cost	(Rs.)
Materials	6,000
Labour	8,000
Overheads	8,000
	22,000

Units introduced into the process: 10,000.

Cost	(Rs.)
Materials	30,000
Labour	52,500
Overheads	70,000
	1,52,500

During the period 7,500 units were completed and transferred to the next process. Closing work-in-progress on 30th April: 7,500 units, 50% complete. *(C) (OLD SM)*

(ANS.: EQUIVALENT PRODUCTION UNITS=8,750, VALUE OF FINISHED PRODUCTION=RS. 1,30,725, CLOSING WIP=RS. 43,787.50)

Note:_____

MODEL 6: PROCESS ACCOUNT WITH TWO MATERIAL CONCEPT

PROBLEM 13: From the following information for the month ending October, 2013, prepare process cost accounts for Process III. Use FIFO method to value equivalent production.

Direct materials added in Process III (Opening WIP)	2,000 units at Rs.25,750
Transfer from Process II	53,000 units at Rs.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	Rs.1,97,600
Direct wages1	Rs.97,600
Production Overheads	Rs.48,800

Degree of completion:

Particulars	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 Rs.3 per unit.

(C) (OLD PM, RTP M16) (ANS.: EQUIVALENT PRODUCTION UNITS=50,500, 49,400, 48,800, 48,800; TRANSFER TO PROCESS IV A/C = RS.7,19,750, ABNORMAL GAIN=RS. 7,500) (SOLVE PROBLEM NO 17,18 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

MODEL 7: INTER-PROCESS PROFITS

Problem 14: (PRINTED SOLUTION AVAILABLE) KMR Ltd. produces product AY, which passes through three processes 'XM', 'YM' and 'ZM'. The output of process 'XM' and 'YM' is transferred to next process at cost plus 20 percent each on transfer price and the output of process 'ZM' is transferred to finished stock at a profit of 25 percent on transfer price. The following information are available in respect of the year ending 31st March, 2017:

Particulars	Process XM (Rs.)	Process YM (Rs.)	Process ZM (Rs.)	Finished Stock (Rs.)
Opening Stock	30,000	54,000	80,000	90,000
Material	1,60,000	1,30,000	1,00,000	-
Wages	2,50,000	2,16,000	1,84,000	-
Manufacturing Overheads	1,92,000	1,44,000	1,33,000	-
Closing Stock	40,000	64,000	78,000	1,00,000
Inter process profit included in Opening Stock	Nil	8,000	20,000	40,000

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from process 'ZM'. Sales of the finished stock during the period was Rs. 28,00,000.

You are required to prepare:

i) All process accounts and

ii) Finished stock account showing profit element at each stage. *(A) (M 17)*

(ANS.: PROFIT AT FINISHED STOCK: RS. 2,18,000; UNREALISED PROFITS AT EACH ELEMENT (ON CLOSING STOCK): XM: NIL; YM: RS. 8,758; ZM: RS. 19,500; FINISHED STOCK: RS. 42,467)

(SOLVE PROBLEM NO 19 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

MODEL 8: COMPREHENSIVE

PROBLEM 15: (PRINTED SOLUTION AVAILABLE) X Associates undertake to prepare income tax returns for individuals for a fee. They use the weighted average method and actual costs for the financial reporting purposes. However, for internal reporting, they use a standard costs system. The standards, based on equivalent performance, have been established as follows:

Labour per return 5 hrs   @ Rs. 40 per hour

Overhead per   5 hrs   @ Rs. 20 per hour

Return: For March 2015 performance, budgeted overhead is Rs. 98,000 for standard labour hours allowed. The following additional information pertains to the month of March 2015:

March 1	Return-in-process	200 Nos
	(25% complete)	
Return started in March		825 Nos
March 31	Return-in-process	125 Nos
	(80% complete)	

Cost Data:

March 1	Return-in-process labour	Rs. 12,000
	— Overheads	Rs. 5,000
March 1 to 31	Labour: 4000 hours	Rs. 1,78,000
	---Overheads	Rs. 90,000

You are required to compute:

a) For each element, equivalent units of performance and the actual cost per equivalent unit.

b) Actual cost of return-in-process on March 31.

c) The standard cost per return.

d) The labour rate, and labour efficiency variance as well as overhead volume and overhead expenditure variance.   *(A) (M16) (ANS.: (A) 190, 95 (B) 28,500,(C) 44.50,(D) 18000(A), 30,000(F), 8,000(F), 3,000(A))*

Note:_____

_____

ASSIGNMENT PROBLEMS

MODEL 1: PREPARATION OF PROCESS ACCOUNTS

PROBLEM 1: From the following data, prepare process accounts indicating the cost of each process and the total cost. The total units that pass through each process were 240 for the period.

	Process A (Rs.)	Process B (Rs.)	Process C (Rs.)
Materials	1,500	500	200
Labour	800	2,000	600
Other expenses	260	720	250

Indirect expenses amounting to Rs.850 may be apportioned on the basis of wages. There was no opening or closing stock.   *(C) (NEW SM,OLDSM) (ANS.: PROCESS-A 2,760; PROCESS-B 6,480; PROCESS-C 7,680)*

PROBLEM 2: Product B is obtained after it passes through three distinct processes. The following information is obtained for May 2002.

Items	Process		
	I	II	III
Direct Material	2,600	1,980	2,962
Direct Wages	2,000	3,000	4,000

1,000 units at Rs.3 each were introduced into the process. There was no stock of materials or work-in-progress at the beginning or end of the period.

The output of each process passes direct to the next process and finally to the finished stores. Production overhead is recovered at 100% of direct wages. The following additional data is relevant:

Process	Output	Normal Loss % to input	Scrap rate per unit
Process I	950	5%	2
Process II	840	10%	4
Process III	750	15%	5

Prepare process cost accounts and abnormal gain or loss accounts.

(B) (ANS.: PROCESS I - RS. 10 II - RS. 20; III - RS. 38)

PROBLEM 3: 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	Rs.2,00,000	-
Material consumed	Rs.1,92,000	Rs.96,020
Direct labour	Rs.2,24,000	Rs.1,28,000
Manufacturing expenses	Rs.1,40,000	Rs.60,000
Normal wastage of input	10%	10%
Scrap value of normal wastage (per unit)	Rs. 9.90	Rs. 8.60
Output in Units	22,000	20,000

Required:

i) Prepare Process I and Process II account

ii) Prepare Abnormal Gain/ Loss account as the case may be for each process.

(B) (OLD PM) (ANS.: (I) 7,15,000, 9,90,000; II) AMOUNT TO BE TRANSFERRED TO COSTING P&L A/C- ANL= 11,300, ANG=8,180)

PROBLEM 4: RST Limited processes Product Z through two distinct processes - Process I and Process II. On completion, it is transferred to finished stock. From the following information for the year 2011-12, prepare Process I, Process II and Finished Stock A/c:

Particulars	Process I	Process II
Raw materials used	7,500 units	-
Raw materials cost per unit	Rs. 60	-
Transfer to next process/finished stock	7,050 units	6,525 units
Normal loss (on inputs)	5%	10%
Direct wages	Rs. 1,35,750	Rs. 1,29,250
Direct Expenses	60% of Direct wages	65% of Direct wages
Manufacturing overheads	20% of Direct wages	15% of Direct wages
Realisable value of scrap per unit	Rs. 12.50	Rs. 37.50

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-progress.

(A) (OLD SM, NEW SM) (ANS.: COST PER UNIT = 96.795 PER UNIT, 140.05 PER UNIT; NET PROFIT = 1,38,182)

MODEL 2: EQUIVALENT UNITS

PROBLEM 5: XP Ltd. furnishes you the following information relating to process II.

Opening work-in-progress -	NIL
Units introduced	42,000 units @ Rs.12
Expenses debited to the process:	
	(Rs.)
Direct material	61,530
Labour	88,820
Overhead	1,76,400
Normal loss in the process	2 % of input.

Closing work-in-progress	1,200 units
Degree of completion - Materials	100%
Labour	50%
Overhead	40%
Finished output	39,500 units
Degree of completion of abnormal loss:	
Material	100%
Labour	80%
Overhead	60%

Units scraped as normal loss were sold at Rs.4.50 per unit.

All the units of abnormal loss were sold at Rs.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.

(A) (OLD PM) (ANS.: A) 41,160, 40,468, 40,256; B) 7,98,877, 8,295, 19,798; C) 4,155)

PROBLEM 6: 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 Rs.3,27,800

iii) Expenditure debited to process-II-

    Consumables   -   Rs.1,57,200

    Labour   -   Rs.1,04,000

    Overhead   -   Rs.52,0000

iv) Units transferred to process-III - 51,000 units

v)   Closing work in progress   -   2,000 units, (degree of completion):

    Consumables   -   80%

    Labour   -   60%

    Overhead   -   60%

vi) Units scrapped   - 2,000 units, scrapped units were sold at Rs.5 Per unit

vii) Normal loss   -   4% of units introduced

You are required to:

a) Prepare A Statement of Equivalent Production

b) Determine the cost per unit

c) Determine the value of work in progress and units transferred to process-III

(A) (N15 - 8M) (ANS.: A) 52,800,52,400, 52,000,52,000; B)6, 3, 2, 1; C) 20,400, 6,12,000)

PROBLEM 7: Following data are available for a product for the month of July, 2016:

Particulars	Process - I (Rs.)	Process - II (Rs.)
Opening work-in- progress	Nil	Nil
Costs incurred during the month:		
- Direct materials	6,00,000	
- Labour	1,20,000	1,60,000
- Factory overheads	2,40,000	2,00,000

Units of production:		
Received in process	40,000	36,000
Completed and transferred	36,000	32,000
Closing work-in-progress	2,000	?
Normal loss in process	2,000	1,500

Production remaining in process has to be valued as follows:

Materials 100% Labour 50% Overheads 50%

There has been no abnormal loss in Process- II.

The company follows weighted average method for valuing inventory.

Prepare Process Accounts after working out the missing figures and with detailed workings.

(B) (RTP N16) (ANS.: PROCESS - I A/C AMOUNT - 9,60,000; PROCESS - II A/C AMOUNT - 12,78,691)

MODEL 3: PROCESS ACCOUNT WITH FIFO METHOD

PROBLEM 8: 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:

i)   Opening work-in-process at the beginning of the month was 800 liters, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at Rs. 26,640.

ii) Closing work-in-process at the end of the month was 160 liters, 30% complete for labour and 20% complete for overheads.

iii) Normal loss is 10% of input and total losses during the month were 1,800 liters partly due to the fire damage.

iv) Output sent to finished goods warehouse was 4,200 liters.

v)   Losses have a scrap value of Rs.15 per liter.

vi) All raw materials are added at the commencement of the process.

vii) The cost per equivalent unit (liters) is Rs.39 for the month made up as follows:

Particulars	Rs.
Raw material	23
Labour	7
overheads	<u>9</u>
	<u>39</u>

Required:

i)   Calculate the quantity (in liters) of raw material inputs during the month.

ii) Calculate the quantity (in liters) of normal loss expected from the process and the quantity (in liters) of abnormal loss / gain experienced in the month.

iii) Calculate the values of raw material, labour and overheads added to the process during the month.

iv) Prepare the process account for the month.   *(B) (OLD SM, RTP N15, M18)*

(ANS.: ((I) RS.5360 (II) 536 & 1,264 (III) MATERIAL: RS.1,18,992, LABOUR: RS. 34,664, OVERHEADS: RS. 45,144, (IV) 2,25,440)

PROBLEM 9: The following information relate to Process A:

i)	Opening Work-in-Process	8,000 units at Rs.15,00,000
	Degree of Completion: Material	100%
	Labour and Overhead	60%
ii)	Input 1,82,000 units at	Rs.1,47,50,000
iii)	Wages paid	Rs.68,12,000
iv)	Overheads paid	Rs.34,06,000
v)	Units scrapped	14,000
	Degree of Completion: Material	100%
	Wages and Overheads	80%
vi)	Closing Work - in- Process	18,000 units
	Degree of Completion: Material	100%
	Wages and Overheads	70%
vii)	Units completed and transferred to next process 1,58,000 units	
viii)	Normal loss 10% of total input including opening WIP	
ix)	Scrap value is Rs.15 per unit to be adjusted out of direct material cost	

You are required to compute on the basis of FIFO:

a) Equivalent Production

b) Cost per unit

c) Value of units transferred to next process.

(A) (MTP2 N18, SIMILAR: OLD PM, N14, 8M) (ANS.: A) 1,63,000; 1,60,800; B) RS. 152.2871; C) RS. 2,45,46,408.36)

PROBLEM 10: The following data are available in respect of Process-I for October 2014:

Opening stock of work in process: 600 units at a total cost of Rs. 84,000.	
Degree of completion of opening work in process:	
Material	100%
Labour	60%
Overhead	60%
Input of materials at a total cost of Rs. 9,04,000 for 9,200 units.	
Direct wages incurred Rs. 3,72,000	
Overheads Rs. 1,72,600.	
Units scrapped 200 units. The stage of completion of these units was:	
Material	100%
Labour	80%
Overheads	80%
Closing work in process; 700 units. The stage of completion of these units was:	
Material	100%
Labour	70%
Overheads	70%
8,900 units were completed and transferred to the next process.	
Normal loss is 4% of the total input (opening stock plus units put in)	
Scrap value is Rs. 120 per unit.	

You are required to:

a) Compute equivalent production,

b) Calculate the cost per equivalent unit for each element.

c) Calculate the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method.

(A) (RTP N17) (ANS.: A) 8,808; 8,838; 8,838; B) 120; 42.10; 19.53; C) 34,872.96; 1,14,198.70; 16,06,320.20)

PROBLEM 11: Following information is available regarding Process A for the month of October 2013:

Production Record:	
Opening work-in progress (Material: 100% complete, 25% complete for labour& overheads)	40,000 Units
Units Introduced	1,80,000 Units
Units Completed	1,50,000 Units
Units in-process on 31.10.2013 (Material: 100% complete, 50% complete for labour& overheads)	70,000 Units
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   (A) (OLD PM) (ANS.: I) 1,80,000, 1,75,000; II) 3.66667, 8.45714; III) 17,57,333, 5,52,667)

PROBLEM 12: The following data pertains to Process- A for March 2015 of Akash Limited:

Opening Work in Progress	1,500 units at	Rs. 15,000
Degree of completion :		
Materials 100%; Labour and Overheads $33\frac{1}{3}\%$		
Input of Materials	18,500 units at	Rs. 52,000
Direct Labour		Rs. 14,000
Overheads		Rs. 28,000
Closing Work in Progress	5,000 units	
Degree of Completion Materials 90 and Labour and Overheads 30%		
Normal Process Loss is 10% of total Input (opening work in progress units + units put in)		
Scrap value Rs. 2.00 per unit		

Units transferred to the next process 15,000 units.

You are required to:

i) Compute equivalent units of production.

ii) Compute cost per equivalent unit for each cost element i.e., materials, labour and overheads.

iii) Compute the cost of finished output and closing work in progress.

iv) Prepare the process and other Accounts.

Assume:

- FIFO Method is used by the Company.

- The cost of opening work in progress is fully transferred to the next process.

(B) (MTP N15) (ANS.: I) 16,000, 14,000, 14,000; II) 3, 1, 2; III) 99,000, 18,000)

MODEL 4: PROCESS ACCOUNT WITH AVERAGE METHOD

PROBLEM 13: 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) (4/5 completed)	4,000
At the end of the month (units) (2/3 completed)	3,000
Cost records:	
Work in process at the beginning of the month	
Material	Rs.30,000
Conversion cost	Rs.29,200
Cost during the month : materials	Rs.1,20,000
Conversion cost	Rs.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.   *(B) (OLD PM)(ANS.: I) 18,560, 17,560, 8.0819, 10.8200; II) 2,72,188, 45,886, 21,926)*

PROBLEM 14: Following details are related to the work done in Process 'A' XYZ Company during the month of March, 2015

	(Rs.)
Opening work-in progress (2,000 units)	
Materials	80,000
Labour	15,000
Overheads	45,000
Materials introduced in Process 'A' (38,000 units)	14,80,000
Direct Labour	3,59,000
Overheads	10,77,000

Units scrapped: 3,000 units

Degree of completion:

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 Rs.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.

(A) (NEW SM, OLD SM ,OLD PM) (ANS.: I. EQUIVALENT PRODUCTION UNITS: MATERIAL = 38,000, LABOUR = 37,400, OVERHEADS = 37,400, II. MATERIAL = RS.40, LABOUR = RS.10, OVERHEADS = RS.30, III. 28 LAKHS, RS. 72,000, RS.1,44,000)

PROBLEM 15: The following details are available of Process X for August 2013:

Opening work-in-progress	8,000 units
Degree of completion and cost: Material (100%) Labour (60%) Overheads (60%)	Rs. 63,900 Rs. 10,800 Rs. 5,400
Input 1,82,000 units at	Rs. 7,56,900
Labour paid	Rs. 3,28,000
Over heads incurred	Rs. 1,64,000
Units scrapped	14,000
Degree of completion: Material Labour and overhead	100% 80%
Closing work-in-process	18000 units
Degree of completion: Material Labour and overhead	100% 70%
1,58,000 units were completed and transferred to next process.	
Normal loss is 8% of total input including opening work-in-process	
Scrap value is Rs. 8 per unit to be adjusted in direct material cost	

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

a) Equivalent production, and

b) Cost per unit   *(A) (OLD PM, N11, 8M)(ANS.: A) 1,74,800, L&OH - 1,69,400, B) M = 4, L = 2, OH = 1)*

PROBLEM 16: Following details are related to the work done in Process-I of Walker Ltd. during the month of January, 2014:

	(Rs.)
Opening work-in progress (1,500 units)	
Material	60,000
Labour	35,000
Overheads	30,000
Materials introduced in Process-I (35,000 units)	14,00,000
Direct Labour	3,46,000
Overheads	6,37,000
Units scrapped : 1,800 units	
Degree of completion :	
Material	100%
Labour & overheads	80%
Closing work-in progress : 1,500 units	
Degree of completion :	
Material	100%
Labour & overheads	80%

Units finished and transferred to Process-II : 32,000 units
Normal Loss: 5% of total input including opening work-in-progress. Scrapped units fetch Rs. 8 per piece.

You are required to prepare:

i) Statement of equivalent production

ii) Statement of costs

iii) Statement of distribution of costs and

iv) Process-I Account, Normal and Abnormal Loss Accounts.

(B) (RTP M14) (ANS.: I) 34,675, 34,140, 34,140; II) 41.6842, 11.1599, 19.5372; III) 23,16,202, 99,363, 77,835)

MODEL 5: PROCESS ACCOUNT WITH LIFO METHOD

NIL

MODEL 6: PROCESS ACCOUNT WITH TWO MATERIAL CONCEPT

PROBLEM 17: From the following information for the month of January, 2013, prepare Process-III cost accounts under FIFO method.

Opening WIP in Process-III	1,600 units at Rs. 24,000
Transfer from Process-II	55,400 units at Rs. 6,23,250
Transferred to warehouse	52,200 units
Closing WIP of Process-III	4,200 units
Units Scrapped	600 units
Direct material added in Process-III	Rs. 2,12,400
Direct wages	Rs. 96,420
Production overheads	Rs. 56,400

Degree of completion:

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

The normal loss in the process was 5% of the production and scrap was sold @ Rs. 5 per unit.

(Students may treat material transferred from Process - II as Material - A and fresh material used in Process - III as Material B)

(C) (RTP N18 (N&O), RTP N13, MTP N14) (ANS.: FINISHED GOODS - 9,70,422.36, CLOSING WIP - 66,874.06)

PROBLEM 18: Arnav Ltd. manufactures a variety of chemicals which pass through a number of processes. One of these products, F9, passes through process A, B and C before being transferred to the finished goods warehouse.

You are required, from the details given below, to prepare accounts for the month of September 2015 for:

i) Process C;

ii) Abnormal loss/ gain;

iii) Finished goods.

Data for process C for the month of September 2015 is as follows:

Particulars	Amount (Rs.)
Work in process, 1st September, 2015: 6,000 units	19,440
Degree of completion:	
Direct materials 60%	
Direct wages and Production overhead 40%	

Transferred from process B: 48,000 units at Rs. 2.30 per unit Transferred to finished goods: 46,500 units	
Costs Incurred:	
Direct materials added	27,180
Direct wages	18,240
Production overhead	36,480
Work-in-process, 30th September, 2015: 4,000 units	
Degree of completion:	
Direct materials added 50% Direct wages and production overhead 30%	
Normal loss in process: 6% of units in opening stock plus transfers from process Bless closing stock	

At a certain stage in the process, it is convenient for the quality control inspector to examine the product and where necessary reject it. Rejected products are then sold for Rs. 0.80 per unit.

During September 2015 an actual loss of 7 % was incurred, with Product F9 having reached the following stage of production: Direct material added 80%, Direct wages and Production overheads 60%. Company is following FIFO method of inventory valuation. *(C) (MTP N15)*

(ANS.: EQUIVALENT UNITS: M₁: 45,000 M₂: 45,300; L & OH: 45,600; COST PER EQUIVALENT UNITS: 2.4; 0.6; 1.2; COST OF FG: 1,95,300)

MODEL 7: INTER-PROCESS PROFITS

PROBLEM 19: A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 2014:

	Process I (Rs.)	Process II (Rs.)	Finished stock (Rs.)
Opening stock	7,500	9,000	22,500
Direct material	15,000	15,750	--
Direct wages	11,200	11,250	--
Factory overheads	10,500	4,500	--
Closing stock	3,700	4,500	11,250
Inter-process profit included in opening stock	--	1,500	8,250

Output of Process I is transferred to Process II at 25% profit on the transfer price.

Output of Process II is transferred to finished stock at 20% profit on the transfer price. Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales during the period are Rs.1,40,000.

Prepare Process cost accounts and finished goods account showing the profit element at each stage.

(A) (NEW SM, OLD SM) (ANS.: PROCESS - I 13500, PROCESS - II 22500, PROCESS - III 16,250)

MODEL 8: COMPREHENSIVE

NIL

PRINTED SOLUTIONS TO SOME SELECTIVE PROBLEMS

PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED 4, 6, 14, 15

PROBLEM NO. 4

Process- A Account

Particulars	Units	Amount	Particulars	Units	Amount
To Input	40,000	3,60,000	By Normal wastage (2,000 units × Rs.15)	2,000	30,000
To Material	---	2,42,000	By Abnormal loss A/c (1,000 units × Rs.27)	1,000	27,000
To Direct wages	---	2,58,000	By Process- B (29,600 units × Rs.27)	29,600	7,99,200

To Manufacturing Exp.	---	1,96,000	By Profit & Loss A/c (7,400 units × Rs.27)	7,400	1,99,800
	40,000	**10,56,000**		**40,000**	**10,56,000**

Cost per unit = $\dfrac{10,56,000 - 30,000}{40,000\text{ units} - 2,000\text{ units}}$ = Rs.27 per unit

Normal wastage = 40,000 units × 5% = 2,000 units

Abnormal loss = 40,000 units - (37,000 units + 2,000 units) = 1,000 units

Transfer to Process- B = 37,000 units × 80% = 29,600 units

Sale = 37,000 units × 20% = 7,400 units

Process - B Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process- A	29,600	7,99,200	By Normal wastage (2,960 units × Rs.20)	2,960	59,200
To Material	---	2,25,000	By Profit & Loss A/c (27,000 units × Rs.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 × Rs.48)	360	17,280			
	29,960	**13,55,200**		**29,960**	**13,55,200**

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

Normal wastage = 29,600 units × 10% = 2,960 units

Abnormal gain = (27,000 units + 2,960 units) - 29,600 units = 360 units

Profit & Loss Account

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Process- A A/c	1,99,800	By Sales:	
To Process- B A/c	12,96,000	Process-A (7,400 units × Rs.37)	2,73,800
To Indirect Expenses	4,48,080	Process- B (27,000 units × Rs.61)	16,47,000
		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 (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	2,000	30,000	By Abnormal Gain A/c (360 units × Rs.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 (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	1,000	27,000	By Bank A/c (1,000 units × Rs.15)	1,000	15,000
			By Profit & Loss A/c	---	12,000
	1,000	**27,000**		**1,000**	**27,000**

Abnormal Gain Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Normal loss A/c (360 units × Rs.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**

PROBLEM NO. 6

Process- I A/c

Particulars	Qty. (Kgs.)	Amount (Rs.)	Particulars	Qty. (Kgs.)	Amount (Rs.)
To Material A	6,000	3,00,000	By Normal loss	500	8,000
To Material B	4,000	4,00,000	By Process-II A/c	9,200	7,38,857
To Labour	-	21,500	By Abnormal loss A/c	300	24,093
To Overheads $\left(\dfrac{Rs.92,000 \times 430hrs}{800hrs}\right)$	-	49,450			
	10,000	**7,70,950**		**10,000**	**7,70,950**

$$= \frac{\{(Rs.3,00,000 + Rs.4,00,000 + Rs.49,450) - Rs.8,000)\}}{(10,000 - 500)\,units}$$

$$= \frac{Rs.7,70,950 - Rs.8,000}{9,500\,units} = Rs.\ 80.3105$$

Process- II A/c

Particulars	Qty. (Kgs.)	Amount (Rs.)	Particulars	Qty. (Kgs.)	Amount (Rs.)
To Process- I A/c	9,200	7,38,857	By Normal loss	1,000	-
To Material C	6,600	8,25,000	By Packing Dept. A/c (See the working notes)	18,000	18,42,496
To Material D	4,200	3,15,000	By WIP A/c (See the working notes)	1,000	1,00,711
To Flavouring essence	-	3,300			
To Labour	-	18,500			
To Overheads $\left(\dfrac{Rs.92,000 \times 370hrs}{800hrs}\right)$	-	42,550			
	20,000	**19,43,207**		**20,000**	**19,43,207**

Abnormal loss A/c

Particulars	Qty. (Kgs.)	Amount (Rs.)	Particulars	Qty. (Kgs.)	Amount (Rs.)
To Process- I A/c	300	24,093	By Bank	300	4,800
			By Costing P&L A/c	-	19,293
	300	**24,093**		**300**	**24,093**

Working Notes:

Calculation of Equivalent Production units

Input	Units	Output	Units	Process- I (%)	Process- I Units	Mat- C & D (%)	Mat- C & D Units	Labour & OH (%)	Labour & OH Units
Process- I	9,200	Transferred to Packing	18,000	100	18,000	100	18,000	100	18,000
Mat- C	6,600	Closing WIP	1,000	100	1,000	100	1,000	50	500
Mat- D	4,200	Normal loss	1,000	-	-	-	-	-	-
	20,000		**20,000**		**19,000**		**19,000**		**18,500**

Calculation of Unit cost

Cost component	Amount (Rs.)	Equivalent units	Cost per unit (Rs.)
Transferred- in	7,38,857	19,000	38.8872
Material- C	8,25,000	19,000	43.4211
Material- D	3,15,000	19,000	16.5789
Flavouring essence	3,300	19,000	0.1737
Total Material Cost	18,82,157	19,000	99.0609
Labour	18,500	18,500	1.0000
Overheads	42,550	18,500	2.3000
Total Cost	19,43,207		102.3609

Value of Materials transferred to Packing Department = 18,000 units x Rs. 102.3609 = 18,42,496

Value of WIP: For Materials- 1,000 units x Rs. 99.0609   =   Rs.   99,061

For a Labour & Overheads 500 units x Rs. 3.30   =   Rs.   650

Rs. 1,00,711

PROBLEM NO. 14

i) Dr.   Process 'XM' A/c   Cr.

Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)	Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)
To Opening Stock	30,000	-	30,000	By Process 'YM' A/c (Transfer)	5,92,000	1,48,000	7,40,000
To Material	1,60,000	-	1,60,000				
To Wages	2,50,000	-	2,50,000				
Total	4,40,000	-	4,40,000				
Less: Closing stock	40,000	-	40,000				
Prime Cost	4,00,000		4,00,000				
To Manufacturing Overheads	1,92,000	-	1,92,000				
Total cost	5,92,000	-	5,92,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)	1,48,000	1,48,000	-				
	5,92,000	**1,48,000**	**7,40,000**		**5,92,000**	**1,48,000**	**7,40,000**

Dr.   Process 'YM' A/c   Cr.

Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)	Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)
To Opening Stock	46,000	8,000	54,000	By Process 'ZM' A/c (Transfer)	10,72,758	4,52,242	15,25,000
To Process 'XM' A/c	5,92,000	1,48,000	7,40,000				
To Material	1,30,000	--	1,30,000				
To Wages	2,16,000	--	2,16,000				
Total	9,84,000	1,56,000	11,40,000				
Less: Closing stock	55,242	8,758	64,000				
Prime Cost	9,28,758	1,47,242	10,76,000				
To Manufacturing Overheads	1,44,000	--	1,44,000				
Total cost	10,72,758	1,47,242	12,20,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)	--	3,05,000	3,05,000				
	10,72,758	**4,52,242**	**15,25,000**		**10,72,758**	**4,52,242**	**15,25,000**

ii) Dr.   Finished Stock A/c   Cr.

Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)	Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)
To Opening Stock	50,000	40,000	90,000	By Costing P&L A/c (Transfer)	14,83,725	13,16,275	28,00,000
To Process 'ZM' A/c	14,91,258	11,00,742	25,92,000				
Total	15,41,258	11,40,742	26,82,000				
Less: Closing stock	57,533	42,467	1,00,000				
	14,83,725	10,98,275	25,82,000				
To Costing P&L A/c (Profit)	--	2,18,000	2,18,000				

(Bal. fig.)							
	14,83,725	13,16,275	28,00,000		14,83,725	13,16,275	28,00,000

Calculation of amount of unrealized profit on closing stock:

Process 'XM' = Nil

Process 'YM' = $\dfrac{Rs.1,56,000}{Rs.11,40,000} \times Rs.64,000$ = Rs. 8,758

Process 'ZM' = $\dfrac{Rs.4,72,242}{Rs.18,89,000} \times Rs.78,000$ = Rs. 19,500

Finished stock = $\dfrac{Rs.11,00,742}{Rs.25,92,000} \times Rs.1,00,000$ = Rs. 42,467

Note: Unrealised profit on closing finished stock can also be calculated on the basis of Average cost.

PROBLEM NO. 15

a) **Statement Showing Cost Elements Equivalent Units of Performance and the Actual Cost per Equivalent Unit**

Detail of Returns	Detail of Input Units	Details	Output Units	Equivalent Units			
				Labour		Overheads	
				Units	%	Units	%
Returns in Process at Start	200	Returns Completed in March	900	900	100	900	100
Returns Started in March	825	Returns in Process at the end of March	125	100	80	100	80
	1,025		1,025	1,000		1,000	

Costs:	(Rs.)	(Rs.)
From previous month	12,000	5,000
During the month	1,78,000	90,000
Total Cost	1,90,000	95,000
Cost per Equivalent Unit	190.00	95.00

b) **Actual cost of returns in process on March 31:**

	Numbers	Stage of Completion	Rate per Return (Rs.)	Total (Rs.)
Labour	125 returns	0.80	190.00	19,000
Overhead	125 returns	0.80	95.00	9,500
				28,500

c) **Standard Cost per Return:**

Labour: 5 Hrs. × Rs. 40 per hour = Rs. 200

Overhead: 5 Hrs. × Rs. 20 per hour = Rs. 100

                                     Rs. 300

Budgeted volume for March = Rs. 98,000 / 1000 = 980 Returns

Actual labour rate = Rs. 178000 / 4000 = Rs.44.50

d) **Computation of Variances:**

Statement Showing Output (March only) Element Wise	Labour	Overhead
Actual performance in March in terms of equivalent units as Calculated above	1,000	1,000
Less: Returns in process at the beginning of March in terms of equivalent units i.e. 25% of returns (200)	50	50
	950	950

Variance Analysis:

Labour Rate Variance

= Actual Time × (Standard Rate - Actual Rate)

= Standard Rate × Actual Time - Actual Rate × Actual Time

= Rs. 40 × 4,000 hrs. - Rs. 1,78,000 = Rs. 18,000(A)

Labour Efficiency Variance:

= Standard Rate × (Standard Time - Actual Time)

= Standard Rate × Standard Time - Standard Rate × Actual Time

= Rs. 40 × (950 units × 5 hrs.) - Rs. 40 × 4,000 hrs. = Rs. 30,000(F)

Overhead Expenditure or Budgeted Variance:

= Budgeted Overhead - Actual Overhead

= Rs. 98,000 - Rs. 90,000 = Rs. 8,000(F)

Overhead Volume Variance:

= Recovered/Absorbed Overhead - Budgeted Overhead

= 950 Units × 5 hrs. × Rs.20 - Rs. 98,000 = Rs. 3,000(A)

THE END