Cost & Management Accounting
Bachelors of Business (Specialized in Finance) – Study Notes & Tutorial Questions
Chapter 6: Process Costing
Introduction to process costing

Process costing is a costing method used where it is not possible to identify separate units of production, or jobs, usually because of the continuous nature of the production processes involved.

It is common to identify process costing with continuous production such as the following.

- Oil refining
- Foods and drinks
- Paper
- Chemicals

Process costing may also be associated with the continuous production of large volumes of low-cost items, such as cans or tins.

Features of process costing

a. The output of one process becomes the input to the next until the finished product is made in the final process.

b. The continuous nature of production in many processes means that there will usually be closing work in progress which must be valued. In process costing it is not possible to build up cost records of the cost per unit of output or the cost per unit of closing inventory because production in progress is an indistinguishable homogeneous mass.

c. There is often a loss in process due to spoilage, wastage, evaporation and so on.

d. Output from production may be a single product, but there may also be a by-product (or byproducts) and/or joint products.

The aim of this chapter is to describe how cost accountants keep a set of accounts to record the costs of production in a processing industry. The aim of the set of accounts is to derive a cost, or valuation, for output and closing inventory.
Framework for dealing with process costing

Process costing is centred around four key steps. The exact work done at each step will depend on whether there are normal losses, scrap, opening and closing work in progress.

- Step 1 Determine output and losses
- Step 2 Calculate cost per unit of output, losses and WIP
- Step 3 Calculate total cost of output, losses and WIP
- Step 4 Complete accounts

Let's look at these steps in more detail

Step 1 Determine output and losses. This step involves the following.

- Determining expected output
- Calculating normal loss and abnormal loss and gain
- Calculating equivalent units if there is closing or opening work in progress

Step 2 Calculate cost per unit of output, losses and WIP. This step involves calculating cost per unit or cost per equivalent unit.

Step 3 Calculate total cost of output, losses and WIP.

In some examples this will be straightforward; however in cases where there is closing and/or opening work-in-progress a statement of evaluation will have to be prepared.

Step 4 Complete accounts.

This step involves the following.

- Completing the process account
- Writing up the other accounts required by the question
Losses in process costing

Losses may occur in process. If a certain level of loss is expected, this is known as normal loss. If losses are greater than expected, the extra loss is abnormal loss. If losses are less than expected, the difference is known as abnormal gain.

Normal loss is the loss expected during a process. It is not given a cost.

Abnormal loss is the extra loss resulting when actual loss is greater than normal or expected loss, and it is given a cost.

Abnormal gain is the gain resulting when actual loss is less than the normal or expected loss, and it is given a 'negative cost'.

Since normal loss is not given a cost, the cost of producing these units is borne by the 'good' units of output.

Abnormal loss and gain units are valued at the same unit rate as 'good' units. Abnormal events do not therefore affect the cost of good production. Their costs are analysed separately in an abnormal loss or abnormal gain account.

*Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing.*

- Pele
**Losses with scrap value**

Scrap is 'Discarded material having some value.'

- The scrap value of normal loss is usually deducted from the cost of materials.
- The scrap value of abnormal loss (or abnormal gain) is usually set off against its cost, in an abnormal loss (abnormal gain) account.

As the questions that follow will show, the three steps to remember are these.

**Step 1**

Separate the scrap value of normal loss from the scrap value of abnormal loss or gain.

**Step 2**

In effect, subtract the scrap value of normal loss from the cost of the process, by crediting it to the process account (as a 'value' for normal loss).

**Step 3**

Either subtracts the value of abnormal loss scrap from the cost of abnormal loss, by crediting the abnormal loss account.

Or subtract the cost of the abnormal gain scrap from the value of abnormal gain, by debiting the abnormal gain account.
Abnormal losses and gains never affect the cost of good units of production. The scrap value of abnormal losses is not credited to the process account, and abnormal loss and gain units carry the same full cost as a good unit of production.

**Losses with a disposal cost**

You must also be able to deal with losses which have a disposal cost.

The basic calculations required in such circumstances are as follows.

(a) Increase the process costs by the cost of disposing of the units of normal loss and use the resulting cost per unit to value good output and abnormal loss/gain.

(b) The normal loss is given no value in the process account.

(c) Include the disposal costs of normal loss on the debit side of the process account.

(d) Include the disposal costs of abnormal loss in the abnormal loss account and hence in the transfer of the cost of abnormal loss to the income statement

**Valuing closing work in progress**

When units are partly completed at the end of a period (and hence there is closing work in progress), it is necessary to calculate the equivalent units of production in order to determine the cost of a completed unit.
**Equivalent units**

Equivalent units are notional whole units which represent incomplete work, and which are used to apportion costs between work in process and completed output.

**Different rates of input**

In many industries, materials, labour and overhead may be added at different rates during the course of production.

a) Output from a previous process (for example the output from process 1 to process 2) may be introduced into the subsequent process all at once, so that closing inventory is 100% complete in respect of these materials.

b) Further materials may be added gradually during the process, so that closing inventory is only partially complete in respect of these added materials.

c) Labour and overhead may be 'added' at yet another different rate. When production overhead is absorbed on a labour hour basis, however, we should expect the degree of completion on overhead to be the same as the degree of completion on labour.

When this situation occurs, equivalent units, and a cost per equivalent unit, should be calculated separately for each type of material, and also for conversion costs.
Valuing opening work in progress: FIFO method

Account can be taken of opening work in progress using either the FIFO method or the weighted average cost method.

The FIFO method of valuation deals with production on a first in, first out basis. The assumption is that the first units completed in any period are the units of opening inventory that were held at the beginning of the period.

Valuing opening work in progress: weighted average cost method

An alternative to FIFO is the weighted average cost method of inventory valuation which calculates a weighted average cost of units produced from both opening inventory and units introduced in the current period.

By this method no distinction is made between units of opening inventory and new units introduced to the process during the accounting period. The cost of opening inventory is added to costs incurred during the period, and completed units of opening inventory are each given a value of one full equivalent unit of production.

Which method should be used?

FIFO inventory valuation is more common than the weighted average method, and should be used unless an indication is given to the contrary. You may find that you are presented with limited information about the opening inventory, which forces you to use either the FIFO or the weighted average method. The rules are as follows.

a) If you are told the degree of completion of each element in opening inventory, but not the value of each cost element, then you must use the FIFO method.

b) If you are not given the degree of completion of each cost element in opening inventory, but you are given the value of each cost element, then you must use the weighted average method.
Joint products and by-products

Joint products are two or more products separated in a process, each of which has a significant value compared to the other. A by-product is an incidental product from a process which has an insignificant value compared to the main product.

Joint products are two or more products which are output from the same processing operation, but which are indistinguishable from each other up to their point of separation.

A by-product is a supplementary or secondary product (arising as the result of a process) whose value is small relative to that of the principal product.

a) Joint products have a substantial sales value. Often they require further processing before they are ready for sale. Joint products arise, for example, in the oil refining industry where diesel fuel, petrol, paraffin and lubricants are all produced from the same process.

b) The distinguishing feature of a by-product is its relatively low sales value in comparison to the main product. In the timber industry, for example, by-products include sawdust, small offcuts and bark.

What exactly separates a joint product from a by-product?

a) A joint product is regarded as an important saleable item, and so it should be separately costed. The profitability of each joint product should be assessed in the cost accounts.

b) A by-product is not important as a saleable item, and whatever revenue it earns is a 'bonus' for the organisation. Because of their relative insignificance, by-products are not separately costed.
**Problems in accounting for joint products**

The point at which joint products and by-products become separately identifiable is known as the split off point or separation point. Costs incurred up to this point are called common costs or joint cost.

Costs incurred prior to this point of separation are common or joint costs, and these need to be allocated (apportioned) in some manner to each of the joint products. In the following sketched example, there are two different split-off points.

![Diagram of split-off points](image)

**Problems in accounting for joint products are basically of two different sorts.**

a) How common costs should be apportioned between products, in order to put a value to closing inventories and to the cost of sale (and profit) for each product.

b) Whether it is more profitable to sell a joint product at one stage of processing, or to process the product further and sell it at a later stage.

**Dealing with common costs**

The main methods of apportioning joint costs, each of which can produce significantly different results are as follows.

- Physical measurement
- Relative sales value apportionment method; sales value at split-off point
The problem of costing for joint products concerns common costs, that is those common processing costs shared between the units of eventual output up to their 'split-off point'. Some method needs to be devised for sharing the common costs between the individual joint products for the following reasons.

   a) To put a value to closing inventories of each joint product.
   b) To record the costs and therefore the profit from each joint product.
   c) Perhaps to assist in pricing decisions.

Here are some examples of the common costs problem.

   a) How to spread the common costs of oil refining between the joint products made (petrol, naphtha, kerosene and so on).
   b) How to spread the common costs of running the telephone network between telephone calls in peak and cheap rate times, or between local and long distance calls.

Various methods that might be used to establish a basis for apportioning or allocating common costs to each product are as follows.

   - Physical measurement
   - Relative sales value apportionment method; sales value at split-off point

WHAT HURTS YOU TODAY, MAKES YOU STRONGER TOMORROW.
Dealing with common costs: physical measurement

With physical measurement, the common cost is apportioned to the joint products on the basis of the proportion that the output of each product bears by weight or volume to the total output. An example of this would be the case where two products, product 1 and product 2, incur common costs to the point of separation of $3,000 and the output of each product is 600 tons and 1,200 tons respectively.

Product 1 sells for $4 per ton and product 2 for $2 per ton.

The division of the common costs ($3,000) between product 1 and product 2 could be based on the tonnage of output.

<table>
<thead>
<tr>
<th>Output</th>
<th>Product 1</th>
<th>Product 2</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>600 tons</td>
<td>1,200 tons</td>
<td>1,800 tons</td>
</tr>
<tr>
<td>Proportion of common cost</td>
<td>600/1,800</td>
<td>1,200/1,800</td>
<td>1,800/1,800</td>
</tr>
<tr>
<td>Apportioned cost</td>
<td>$1,000</td>
<td>$2,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Sales</td>
<td>2,400</td>
<td>2,400</td>
<td>4,800</td>
</tr>
<tr>
<td>Profit</td>
<td>1,400</td>
<td>400</td>
<td>1,800</td>
</tr>
<tr>
<td>Profit/sales ratio</td>
<td>58.3%</td>
<td>16.7%</td>
<td>37.5%</td>
</tr>
</tbody>
</table>

Physical measurement has the following limitations.

a) Where the products separate during the processes into different states, for example where one product is a gas and another is a liquid, this method is unsuitable.

b) This method does not take into account the relative income-earning potentials of the individual products, with the result that one product might appear very profitable and another appear to be incurring losses.
Dealing with common costs: sales value at split-off point

The relative sales value method is the most widely used method of apportioning joint costs because (ignoring the effect of further processing costs) it assumes that all products achieve the same profit margin.

With relative sales value apportionment of common costs, the cost is allocated according to the product's ability to produce income. This method is most widely used because the assumption that some profit margin should be attained for all products under normal marketing conditions is satisfied. The common cost is apportioned to each product in the proportion that the sales (market) value of that product bears to the sales value of the total output from the particular processes concerned.

Accounting for by-products

The most common method of accounting for by-products is to deduct the net realisable value of the byproduct from the cost of the main products.

A by-product has some commercial value and any income generated from it may be treated as follows.

a) Income (minus any post-separation further processing or selling costs) from the sale of the byproduct may be added to sales of the main product, thereby increasing sales turnover for the period.

b) The sales of the by-product may be treated as a separate, incidental source of income against which are set only post-separation costs (if any) of the by-product. The revenue would be recorded in the income statement as 'other income'.

c) The sales income of the by-product may be deducted from the cost of production or cost of sales of the main product.

 d) The net realisable value of the by-product may be deducted from the cost of production of the main product. The net realisable value is the final saleable value of the by-product minus any post-separation costs. Any closing inventory valuation of the main product or joint products would therefore be reduced.
The choice of method (a), (b), (c) or (d) will be influenced by the circumstances of production and ease of calculation, as much as by conceptual correctness. The method you are most likely to come across in examinations is method (d). An example will help to clarify the distinction between the different methods.
Practice Questions

Question 1

Suppose that input to a process is 1,000 units at a cost of MVR 4,500. Normal loss is 10% and there is no opening or closing stocks. Determine the accounting entries for the cost of output and the cost of the loss if actual output were as follows.

a) 860 units (so that actual loss is 140 units)

b) 920 units (so that actual loss is 80 units)

Question 2

Shiny Co has two processes, Y and Z. There is an expected loss of 5% of input in process Y and 7% of input in process Z. Activity during a four-week period is as follows.

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material input (kg)</td>
<td>20,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Output (kg)</td>
<td>18,500</td>
<td>26,100</td>
</tr>
</tbody>
</table>

Is there an abnormal gain or abnormal loss for each process?

Question 3

During a four-week period, period 3, costs of input to a process were $29,070. Input was 1,000 units, output was 850 units and normal loss is 10%.

During the next period, period 4, costs of input were again $29,070. Input was again 1,000 units, but output was 950 units.

There were no units of opening or closing inventory.

Required

Prepare the process account and abnormal loss or gain account for each period.
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**Question 4**

3,000 units of material are input to a process. Process costs are as follows.

Material MVR 11,700

Conversion costs MVR 6,300

Output is 2,000 units. Normal loss is 20% of input.

**Required**

Prepare a process account and the appropriate abnormal loss/gain account.

**Question 5**

Charlton Co manufactures a product in a single process operation. Normal loss is 10% of input. Loss occurs at the end of the process. Data for June are as follows.

Opening and closing inventories of work in progress Nil

Cost of input materials (3,300 units) MVR 59,100

Direct labour and production overhead MVR 30,000

Output to finished goods 2,750 units

Calculate the full cost of finished output in June.

**Question 6**

3,000 units of material are input to a process. Process costs are as follows.

Material MVR 11,700

Conversion costs MVR 6,300

Output is 2,000 units. Normal loss is 20% of input.

The units of loss could be sold for MVR1 each. Prepare appropriate accounts.
Question 7

JJ has a factory which operates two production processes, cutting and pasting. Normal loss in each process is 10%. Scrapped units out of the cutting process sell for $3 per unit whereas scrapped units out of the pasting process sell for $5. Output from the cutting process is transferred to the pasting process: output from the pasting process is finished output ready for sale.

Relevant information about costs for control period 7 are as follows.

<table>
<thead>
<tr>
<th></th>
<th>Cutting process</th>
<th>Pasting process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>MVR</td>
<td>Units</td>
</tr>
<tr>
<td>Input materials</td>
<td>18,000</td>
<td>54,000</td>
</tr>
<tr>
<td>Transferred to pasting process</td>
<td>16,000</td>
<td></td>
</tr>
<tr>
<td>Materials from cutting process</td>
<td>16,000</td>
<td></td>
</tr>
<tr>
<td>Added materials</td>
<td>14,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Labour and overheads</td>
<td>32,400</td>
<td>135,000</td>
</tr>
<tr>
<td>Output to finished goods</td>
<td></td>
<td>28,000</td>
</tr>
</tbody>
</table>

Required

Prepare accounts for the cutting process, the pasting process, abnormal loss, abnormal gain and scrap.

DON'T BE AFRAID TO MAKE MISTEAKS
Question 8

Ally Co has the following information available on Process 9.

<table>
<thead>
<tr>
<th>PROCESS 9 ACCOUNT</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>10,000 kg</td>
<td>$59,150</td>
</tr>
<tr>
<td>Finished goods</td>
<td>8,000 kg</td>
<td>$52,000</td>
</tr>
<tr>
<td>Closing WIP</td>
<td>2,000 kg</td>
<td>$7,150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$59,150</td>
</tr>
</tbody>
</table>

How many equivalent units were there for Closing WIP?

Question 9

Ashley Co operates a process costing system. The following details are available for Process 2.

Materials input at beginning of process 12,000 kg, costing MVR18,000

Labour and overheads added MVR 28,000

10,000kg were completed and transferred to the Finished Goods account. The remaining units were 60% complete with regard to labour and overheads. There were no losses in the period.

What is the value of Closing WIP in the process account?

There are two gifts we should give our children: one is roots, and the other is wings.
Question 10

Suppose that Columbine Co is a manufacturer of processed goods, and that results in process 2 for April 20X3 were as follows.

Opening inventory

Material input from process 1 4,000 units

Costs of input:

Material from process 1 6,000

Added materials in process 2 1,080

Conversion costs 1,720

Output is transferred into the next process, process 3.

Closing work in process amounted to 800 units, complete as to:

Process 1 material 100%

Added materials 50%

Conversion costs 30%

Required

Prepare the account for process 2 for April 20X3.
Suppose that information relating to process 1 of a two-stage production process is as follows, for August 20X2.

Opening inventory 500 units: degree of completion 60%
Cost to date MVR2,800
Costs incurred in August 20X2 MVR
Direct materials (2,500 units introduced) 13,200
Direct labour 6,600
Production overhead 6,600 26,400
Closing inventory 300 units: degree of completion 80%

There was no loss in the process.

Required
Prepare the process 1 account for August 20X2.

Walter Co uses the FIFO method of process costing. At the end of a four week period, the following information was available for process P.

Opening WIP 2,000 units (60% complete) costing MVR 3,000 to date
Closing WIP 1,500 units (40% complete)
Transferred to next process 7,000 units

How many units were started and completed during the period?
Question 13

The following information relates to process 3 of a three-stage production process for the month of January 20X4.

Opening inventory

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300 units complete as to:</td>
<td>MVR</td>
</tr>
<tr>
<td>Materials from process 2</td>
<td>100%</td>
</tr>
<tr>
<td>Added materials</td>
<td>90%</td>
</tr>
<tr>
<td>Labour</td>
<td>80%</td>
</tr>
<tr>
<td>Production overhead</td>
<td>80%</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4,400</td>
</tr>
<tr>
<td></td>
<td>1,150</td>
</tr>
<tr>
<td></td>
<td>540</td>
</tr>
<tr>
<td></td>
<td>810</td>
</tr>
<tr>
<td></td>
<td>6,900</td>
</tr>
</tbody>
</table>

In January 20X4, a further 1,800 units were transferred from process 2 at a valuation of MVR 27,000.

Added materials amounted to MVR 6,600 and direct labour to MVR 3,270. Production overhead is absorbed at the rate of 150% of direct labour cost. Closing inventory at 31 January 20X4 amounted to 450 units, complete as to:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Process 2 materials</td>
<td>100%</td>
</tr>
<tr>
<td>Added materials</td>
<td>60%</td>
</tr>
<tr>
<td>Labour and overhead</td>
<td>50%</td>
</tr>
</tbody>
</table>

Required

Prepare the process 3 account for January 20X4 using FIFO valuation principles.
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**Question 14**

Cheryl Co operates a FIFO process costing system. The following information is available for last month.

- **Opening work in progress**: 2,000 units valued at MVR 3,000
- **Input**: 60,000 units costing MVR 30,000
- **Conversion costs**: MVR 20,000
- **Units transferred to next process**: 52,000 units
- **Closing work in progress**: 10,000 units

Opening work in progress was 100% complete with regard to input materials and 70% complete as to conversion. Closing work in progress was complete with regard to input materials and 80% complete as to conversion.

What was the number of equivalent units with regard to conversion costs?

**Believe in yourself!**
Question 15

Magpie produces an item which is manufactured in two consecutive processes. Information relating to process 2 during September 20X3 is as follows.

Opening inventory 800 units

Degree of completion:  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Process 1 materials</td>
<td>100%</td>
<td>4,700</td>
</tr>
<tr>
<td>Added materials</td>
<td>40%</td>
<td>600</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>30%</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,300</td>
</tr>
</tbody>
</table>

During September 20X3, 3,000 units were transferred from process 1 at a valuation of MVR 18,100. Added materials cost MVR 9,600 and conversion costs were MVR 11,800.

Closing inventory at 30 September 20X3 amounted to 1,000 units which were 100% complete with respect to process 1 materials and 60% complete with respect to added materials. Conversion cost work was 40% complete.

Magpie uses a weighted average cost system for the valuation of output and closing inventory.

Required

Prepare the process 2 account for September 20X3.

Question 16

During August, a factory commenced work on 20,000 units. At the start of the month there were no partly finished units but at the end of the month there were 2,000 units which were only 40% complete. Costs in the month were MVR 3,722,400.

(a) How many equivalent units of closing WIP were there in the month?

(b) What is the total value of fully completed output which would show in the process account?
Chapter 6: Process Costing

Question 17

1. Define process costing.

2. Process costing is centered around four key steps.

   Step 1.

   Step 2.

   Step 3.

   Step 4.

3. Abnormal gains result when actual loss is less than normal or expected loss.
   True   [ ]
   False  [ ]

4. 
   Normal loss (no scrap value)  Same value as good output (positive cost)
   Abnormal loss  [ ]  No value
   Abnormal gain  Same value as good output (negative cost)

Question 18

How is revenue from scrap treated?

A. As an addition to sales revenue
B. As a reduction in costs of processing
C. As a bonus to employees
D. Any of the above

6. What is an equivalent unit?

7. When there is closing WIP at the end of a process, what is the first step in the four-step approach to process costing questions and why must it be done?

8. What is the weighted average cost method of inventory valuation?

9. Unless given an indication to the contrary, the weighted average cost method of inventory valuation should be used to value opening WIP.
   True   [ ]
   False  [ ]
**Question 19**

Three joint products are manufactured in a common process, which consists of two consecutive stages. Output from process 1 is transferred to process 2, and output from process 2 consists of the three joint products, Hans, Nils and Bumpsydaisy. All joint products are sold as soon as they are produced.

Data for period 2 of 20X6 are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Process 1</th>
<th>Process 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening and closing</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Direct material</td>
<td>$60,000</td>
<td>$226,200</td>
</tr>
<tr>
<td>(30,000 units at $2 per unit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$76,500</td>
<td>$10% of input</td>
</tr>
<tr>
<td>Normal loss</td>
<td>10% of input</td>
<td></td>
</tr>
<tr>
<td>Scrap value of normal</td>
<td>$0.50 per unit</td>
<td>$2 per unit</td>
</tr>
<tr>
<td>loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>26,000 units</td>
<td>10,000 units of Hans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7,000 units of Nils</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,000 units of Bumpsydaisy</td>
</tr>
</tbody>
</table>

Selling prices are $18 per unit of Hans, $20 per unit of Nils and $30 per unit of Bumpsydaisy.

**Required**

(a) Prepare the Process 1 account.
(b) Prepare the Process 2 account using the sales value method of apportionment.
(c) Prepare a profit statement for the joint products.

**Question 20**

During November 20X3, Splatter Co recorded the following results.

Opening inventory

- main product P, nil
- by-product Z, nil

Cost of production $120,000

Sales of the main product amounted to 90% of output during the period, and 10% of production was held as closing inventory at 30 November.

Sales revenue from the main product during November 20X2 was $150,000.

A by-product Z is produced, and output had a net sales value of $1,000. Of this output, $700 was sold during the month, and $300 was still in inventory at 30 November.

**Required**

Calculate the profit for November using the four methods of accounting for by-products.
Chapter 6: Process Costing

**Question 21**

What is the difference between a joint product and a by-product?
What is meant by the term ‘split-off’ point?
Name two methods of apportioning common costs to joint products.

**Question 22**

Shiny Co has two processes, Y and Z. There is an expected loss of 5% of input in process Y and 7% of input in process Z. Activity during a four week period is as follows.

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material input (kg)</td>
<td>20,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Output (kg)</td>
<td>18,500</td>
<td>26,100</td>
</tr>
</tbody>
</table>

Is there an abnormal gain or abnormal loss for each process?

**Question 23**

3,000 units of material are input to a process. Process costs are as follows.

<table>
<thead>
<tr>
<th></th>
<th>Material</th>
<th>Conversion cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MVR 11,700</td>
<td>MVR 6,300</td>
</tr>
</tbody>
</table>

Output is 2,000 units. Normal loss is 20% of input.

**Required**

Prepare a process account and the appropriate abnormal loss/gain account.
Question 24

Ashley Co operates a process costing system. The following details are available for Process 2.

<table>
<thead>
<tr>
<th>Materials input at beginning of process 12,000 kg costing</th>
<th>MVR 18,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour and OH added</td>
<td>MVR 28,000</td>
</tr>
</tbody>
</table>

10,000 kg were completed and transferred to the Finished Goods Account. The remaining units were 60% complete with regard to labour and OH. There were no losses in the period.

What is the value of closing WIP in the process accounts?

Question 25

Cheryl Co operates a FIFO process costing system. The following information is available for last month.

<table>
<thead>
<tr>
<th>Opening WIP</th>
<th>2,000 units valued at</th>
<th>MVR 3,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>60,000 units costing</td>
<td>MVR 30,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td></td>
<td>MVR 20,000</td>
</tr>
<tr>
<td>Units transferred to next process</td>
<td>52,000 units</td>
<td></td>
</tr>
<tr>
<td>Closing WIP</td>
<td>10,000 units</td>
<td></td>
</tr>
</tbody>
</table>

Opening WIP was 100% complete with regard to input materials and 70% complete as to conversion. Closing WIP was complete with regard to input materials and 80% complete as to conversion.

What was the number of equivalent units with regard to conversion costs?
Chapter 6: Process Costing

Question 26

A company produces a certain food item in a manufacturing process. On 1\textsuperscript{st} November, there was no opening inventory of work in process. During November, 600 units of material were input to the process, with a cost of MVR10,000. Direct labour cost in November were MVR4,450. Production OH is absorbed at the rate of 200\% of direct labour costs. Closing inventory on 30 November consisted of 200 units which were 100\% complete as to materials and 80\% complete as to labour OH. There was no loss in process.

a) Calculate the full production cost of completed units during November.

b) Calculate the value of closing WIP on 30\textsuperscript{th} November.

Question 27

A company uses process costing to establish the cost per unit of its output.

The following information was available for the last month.

<table>
<thead>
<tr>
<th>Input units</th>
<th>10,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output units</td>
<td>9,350</td>
</tr>
<tr>
<td>Opening inventory</td>
<td>350 units, 100% complete for materials and 70% complete for conversion costs</td>
</tr>
<tr>
<td>Closing inventory</td>
<td>550 units, 100% complete for materials and 30% complete for conversion costs</td>
</tr>
</tbody>
</table>

The company uses weighted average method of valuing inventory.

What were the equivalent units for conversion costs?

Question 28

A company operates a continuous process into which 3,500 units of material costing MVR9,500 was input in a period. Conversion costs for this period were MVR12,780 and losses, which have a scrap value of MVR1.25, are expected at rate of 10\% of input. There were no opening or closing inventories and output for the period was 2,800 units.

What was the output valuation?
Question 29

The following information relates to a company’s polishing process for the previous period.

<table>
<thead>
<tr>
<th>Output to finished goods</th>
<th>5,510 units valued @ MVR 29,950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal loss</td>
<td>287 units</td>
</tr>
<tr>
<td>Actual loss</td>
<td>120 units</td>
</tr>
</tbody>
</table>

All losses have a scrap value of MVR2.60 per unit and there was no opening or closing WIP.

Calculate the value of the input during the period.

Question 30

Two products (W and X) are created from a joint process. Both products can be sold immediately after split-off. There are no opening inventories or WIP. The following information is available for last period.

Total joint production costs $776,160

<table>
<thead>
<tr>
<th>Product</th>
<th>Production units</th>
<th>Sales units</th>
<th>Selling price per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>12,000</td>
<td>10,000</td>
<td>$10</td>
</tr>
<tr>
<td>X</td>
<td>10,000</td>
<td>8,000</td>
<td>$12</td>
</tr>
</tbody>
</table>

Using the sales value method of apportioning joint production costs, what was the value of the closing inventory of product X for last period?
**Question 31**

Polly Co operates a process costing system, the final output from which is three different products: Bolly, Dolly and Folly. Details of the three products for March are as follows.

<table>
<thead>
<tr>
<th></th>
<th>Bolly</th>
<th>Dolly</th>
<th>Folly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selling price per unit</strong></td>
<td>$25</td>
<td>$18</td>
<td>$32</td>
</tr>
<tr>
<td><strong>Output for March</strong></td>
<td>6,000 units</td>
<td>10,000 units</td>
<td>4,000 units</td>
</tr>
</tbody>
</table>

22,000 units of material were input to the process, costing $242,000. Conversion costs were $121,000. No losses were expected and there were no opening or closing inventories.

Using the unit basis of apportioining joint costs, what was the profit or loss on sales of Dolly for March?

**Question 32**

Randolph manufactures two joint products, J and K, in a common process. A by-product X is also produced. Data for the month of December 2012 were as follows.

<table>
<thead>
<tr>
<th></th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opening inventory</strong></td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Costs of processing</strong></td>
<td>Direct material</td>
</tr>
<tr>
<td></td>
<td>Direct labour</td>
</tr>
</tbody>
</table>

Production OH are absorbed at the rate of 300% of direct labour costs.

<table>
<thead>
<tr>
<th></th>
<th>Production unit</th>
<th>Sales unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output and sales consisted of:</strong></td>
<td>Product J</td>
<td>8,000</td>
</tr>
<tr>
<td></td>
<td>Product K</td>
<td>8,000</td>
</tr>
<tr>
<td></td>
<td>By-product X</td>
<td>1,000</td>
</tr>
</tbody>
</table>

The sales value per unit of J, K and X is $4, $6 and $0.50 respectively. The saleable value of the by-product is deducted from process costs before apportioning costs to each joint product. Costs of the common processing are apportioned between product J and product K on the basis of sales value of production.

Calculate individual profit for December 2012 for product J & K.
Question 33

A company manufactures two joint products, P and R, in a common process. Data for June are as follows:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening inventory</td>
<td>1,500</td>
</tr>
<tr>
<td>Direct material added</td>
<td>12,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>13,400</td>
</tr>
<tr>
<td>Closing inventory</td>
<td>3,780</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Production unit</th>
<th>Sales unit</th>
<th>Sales price $ per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>4,500</td>
<td>5,500</td>
<td>5.50</td>
</tr>
<tr>
<td>R</td>
<td>6,600</td>
<td>5,500</td>
<td>10</td>
</tr>
</tbody>
</table>

a) If costs are apportioned between joint products on a sales value basis, what was the cost per unit of product R in June?

b) If costs are apportioned between joint product on a physical unit basis, what was the total cost of product P production in June?
Chapter 6: Process Costing

**Question 34**

A company manufactures three joint products and one by product from a single process.

Data for May are as follows.

<table>
<thead>
<tr>
<th>Opening and closing inventories</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials input</td>
<td>$190,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$55,000</td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Units</th>
<th>Sales price $ per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint product L</td>
<td>3,200</td>
<td>32.50</td>
</tr>
<tr>
<td>Joint product M</td>
<td>2,100</td>
<td>42.50</td>
</tr>
<tr>
<td>Joint product N</td>
<td>4,300</td>
<td>38.50</td>
</tr>
<tr>
<td>By – product R</td>
<td>1,100</td>
<td>2.50</td>
</tr>
</tbody>
</table>

By – product sales revenue is credited to the sales account. Joint costs are apportioned on a sales value basis.

What were the full production costs of product M in May (to the nearest $)?

**Question 35**

Two product (W & X) are created from a joint process. Both products can be sold immediately after split-off. There are no opening inventories or WIP. The following information is available for last period.

Total joint production costs $177,780

<table>
<thead>
<tr>
<th>Product</th>
<th>Production units</th>
<th>Sales units</th>
<th>Selling price per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>13,000</td>
<td>11,000</td>
<td>$11</td>
</tr>
<tr>
<td>X</td>
<td>11,000</td>
<td>9,000</td>
<td>$13</td>
</tr>
</tbody>
</table>

Using the sales value method of apportioning joint production costs, what was the value of the closing inventory of product X for last period?
Chapter 6: Process Costing

Question 36

A chemical process has a normal wastage of 10% of input. In a period, 2,500 kgs of material were input and there was an abnormal loss of 75 kgs.

What quantity of good production was achieved?

Question 37

A company manufactures Chemical X, in a single process. At the start of the month there was no work-in-progress. During the month 300 litres of raw material were input into the process at a total cost of $6,000. Conversion costs during the month amounted to $4,500. At the end of the month 250 litres of Chemical X were transferred to finished goods inventory. The remaining work-in-progress was 100% complete with respect to materials and 50% complete with respect to conversion costs. There were no losses in the process.

The equivalent units for closing work-in-progress at the end of the month would have been:

If there had been a normal process loss of 10% of input during the month the value of this loss would have been:

Question 38

In a particular process, the input for the period was 2,000 units. There were no inventories at the beginning or end of the process. Normal loss is 5 per cent of input. In which of the following circumstances is there an abnormal gain?

(i) Actual output = 1,800 units
(ii) Actual output = 1,950 units
(iii) Actual output = 2,000 units

Life is not fair, get used to it.

-Bill Gates-
Chapter 6: Process Costing

**Question 39**

In a process account, abnormal losses are valued:

A. At their scrap value  
B. The same as good production  
C. At the cost of raw materials  
D. The same as normal losses  

(2 marks)

**Question 40**

A company needs to produce 340 litres of Chemical X. There is a normal loss of 10% of the material input into the process. During a given month the company did produce 340 litres of good production, although there was an abnormal loss of 5% of the material input into the process.

How many litres of material were input into the process during the month?

**Question 41**

A company produces a certain food item in a manufacturing process. On 1 November, there was no opening inventory of work in process. During November, 500 units of material were input to the process, with a cost of $9,000. Direct labour costs in November were $3,840. Production overhead is absorbed at the rate of 200% of direct labour costs. Closing inventory on 30 November consisted of 100 units which were 100% complete as to materials and 80% complete as to labour and overhead. There was no loss in process.

The full production cost of completed units during November was

The value of the closing work in progress on 30 November is

---

You can close your eyes to the things you don’t want to see, but you can’t close your heart to the things you don’t want to feel.

- Johnny Depp
**Question 42**

A company makes a product in two processes. The following data is available for the latest period, for process 1.

Opening work in progress of 200 units was valued as follows.

- Material: $2,400
- Labour: $1,200
- Overhead: $400

No losses occur in the process.

Units added and costs incurred during the period:

- Material: $6,000 (500 units)
- Labour: $3,350
- Overhead: $1,490

Closing work in progress of 100 units had reached the following degrees of completion:

- Material: 100%
- Labour: 50%
- Overhead: 30%

The company uses the weighted average method of inventory valuation.

How many equivalent units are used when calculating the cost per unit in relation to overhead?

The value of the units transferred to process 2 was

**Question 43**

A company uses process costing to establish the cost per unit of its output.

The following information was available for the last month:

- Input units: 10,000
- Output units: 9,850
- Opening inventory: 300 units, 100% complete for materials and 70% complete for conversion costs
- Closing inventory: 450 units, 100% complete for materials and 30% complete for conversion costs

The company uses the weighted average method of valuing inventory.

What were the equivalent units for conversion costs?
Chapter 6: Process Costing

**Question 44**

A company uses process costing to value its output. The following was recorded for the period:

- Input materials: 2,000 units at $4.50 per unit
- Conversion costs: $13,340
- Normal loss: 5% of input valued at $3 per unit
- Actual loss: 150 units

There were no opening or closing inventories.

What was the valuation of one unit of output to one decimal place?

**Question 45**

A company operates a continuous process into which 3,000 units of material costing $9,000 was input in a period. Conversion costs for this period were $11,970 and losses, which have a scrap value of $1.50, are expected at a rate of 10% of input. There were no opening or closing inventories and output for the period was 2,900 units.

What was the output valuation?

**Question 46**

The following information relates to a company’s polishing process for the previous period.

- Output to finished goods: 5,408 units valued at $29,744
- Normal loss: 276 units
- Actual loss: 112 units

All losses have a scrap value of $2.50 per unit and there was no opening or closing work in progress.

The value of the input during the period was:

"Change will not come if we wait for some other person or some other time. We are the ones we've been waiting for. We are the change that we seek." — Barack Obama
Chapter 6: Process Costing

Question 47

A company manufactures two joint products, P and R, in a common process. Data for June are as follows.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening inventory</td>
<td>$1,000</td>
</tr>
<tr>
<td>Direct materials added</td>
<td>$10,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$12,000</td>
</tr>
<tr>
<td>Closing inventory</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Production</th>
<th>Sales</th>
<th>Sales price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Units</td>
<td>Units</td>
<td>$ per unit</td>
</tr>
<tr>
<td>P</td>
<td>4,000</td>
<td>5,000</td>
<td>5</td>
</tr>
<tr>
<td>R</td>
<td>6,000</td>
<td>5,000</td>
<td>10</td>
</tr>
</tbody>
</table>

If costs are apportioned between joint products on a sales value basis, what was the cost per unit of product R in June?

If costs are apportioned between joint products on a physical unit basis, what was the total cost of product P production in June?

Question 48

A company manufactures two joint products and one by-product in a single process. Data for November are as follows.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material input</td>
<td>$216,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$72,000</td>
</tr>
</tbody>
</table>

There were no inventories at the beginning or end of the period.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output</td>
<td>Sales price</td>
</tr>
<tr>
<td></td>
<td>Units</td>
<td>$ per unit</td>
</tr>
<tr>
<td>Joint product E</td>
<td>21,000</td>
<td>15</td>
</tr>
<tr>
<td>Joint product Q</td>
<td>18,000</td>
<td>10</td>
</tr>
<tr>
<td>By-product X</td>
<td>2,000</td>
<td>2</td>
</tr>
</tbody>
</table>

By-product sales revenue is credited to the process account. Joint costs are apportioned on a sales value basis. What were the full production costs of product Q in November (to the nearest $)?
Chapter 6: Process Costing

**Question 49**

A company manufactures three joint products and one by-product from a single process. Data for May are as follows.

<table>
<thead>
<tr>
<th>Opening and closing inventories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials input</td>
<td>$180,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Joint product</th>
<th>Units</th>
<th>Sales price $ per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>3,000</td>
<td>32</td>
</tr>
<tr>
<td>M</td>
<td>2,000</td>
<td>42</td>
</tr>
<tr>
<td>N</td>
<td>4,000</td>
<td>38</td>
</tr>
<tr>
<td>By-product R</td>
<td>1,000</td>
<td>2</td>
</tr>
</tbody>
</table>

By-product sales revenue is credited to the sales account. Joint costs are apportioned on a sales value basis.

What were the full production costs of product M in May (to the nearest $)?

**Question 50**

Two products G and H are created from a joint process. G can be sold immediately after split-off. H requires further processing before it is in a saleable condition. There are no opening inventories and no work in progress. The following data are available for last period:

<table>
<thead>
<tr>
<th>Total joint production costs</th>
<th>384,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further processing costs (product H)</td>
<td>159,600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Selling price per unit</th>
<th>Sales Units</th>
<th>Production Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>$0.84</td>
<td>400,000</td>
<td>412,000</td>
</tr>
<tr>
<td>H</td>
<td>$1.82</td>
<td>200,000</td>
<td>228,000</td>
</tr>
</tbody>
</table>

Using the physical unit method for apportioning joint production costs, what was the cost value of the closing inventory of product H for last period?
Chapter 6: Process Costing

**Question 51**

Two products (W and X) are created from a joint process. Both products can be sold immediately after split-off. There are no opening inventories or work in progress. The following information is available for last period:

<table>
<thead>
<tr>
<th>Product</th>
<th>Production units</th>
<th>Sales units</th>
<th>Selling price per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>12,000</td>
<td>10,000</td>
<td>$10</td>
</tr>
<tr>
<td>X</td>
<td>10,000</td>
<td>8,000</td>
<td>$12</td>
</tr>
</tbody>
</table>

Total joint production costs $776,160

Using the sales value method of apportioning joint production costs, what was the value of the closing inventory of product X for last period?

**Question 52**

Information relating to two processes (F and G) was as follows:

<table>
<thead>
<tr>
<th>Process</th>
<th>Normal loss as % of input</th>
<th>Input litres</th>
<th>Output litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>8</td>
<td>65,000</td>
<td>58,900</td>
</tr>
<tr>
<td>G</td>
<td>5</td>
<td>37,500</td>
<td>35,700</td>
</tr>
</tbody>
</table>

For each process, was there an abnormal loss or an abnormal gain?

Process F

Process G

---

*If you want the cooperation of humans around you, you must make them feel they are important — and you do that by being genuine and humble.*

— Nelson Mandela
Question 53

A company operates a process in which no losses are incurred. The process account for last month, when there was no opening work-in-progress, was as follows:

<table>
<thead>
<tr>
<th>Process Account</th>
<th>$</th>
<th></th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs arising</td>
<td>624,000</td>
<td>Finished output</td>
<td>480,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10,000 units)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closing work-in-progress (4,000 units)</td>
<td>144,000</td>
</tr>
<tr>
<td></td>
<td>624,000</td>
<td></td>
<td>624,000</td>
</tr>
</tbody>
</table>

The closing work-in-progress was complete to the same degree for all elements of cost.

What was the percentage degree of completion of the closing work-in-progress?

Question 54

Two products G and H are created from a joint process. G can be sold immediately after split-off. H requires further processing into product HH before it is in a saleable condition. There are no opening inventories and no work in progress of products G, H or HH. The following data are available for last period:

<table>
<thead>
<tr>
<th></th>
<th>$</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total joint production costs</td>
<td>350,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further processing costs of product H</td>
<td>66,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Production units</th>
<th>Closing inventory units</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>420,000</td>
<td>20,000</td>
</tr>
<tr>
<td>HH</td>
<td>330,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>

Using the physical unit method for apportioning joint production costs, what was the cost value of the closing inventory of product HH for last period?
**Chapter 6: Process Costing**

**Question 55**

A company which operates a process costing system had work-in-progress at the start of last month of 300 units (valued at £1,710) which were 60% complete in respect of all costs. Last month a total of 2,000 units were completed and transferred to the finished goods warehouse. The cost per equivalent unit for costs arising last month was $10. The company uses the FIFO method of cost allocation.

What was the total value of the 2,000 units transferred to the finished goods warehouse last month?

**Question 56**

Charleville operates a continuous process producing three products and one by-product. Output from the process for a month was as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Selling price per unit</th>
<th>Units of output from process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>£18</td>
<td>10,000</td>
</tr>
<tr>
<td>2</td>
<td>£25</td>
<td>20,000</td>
</tr>
<tr>
<td>3</td>
<td>£20</td>
<td>20,000</td>
</tr>
<tr>
<td>4 (by-product)</td>
<td>£2</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Total output costs were £277,000.

What was the unit valuation for product 3 using the sales revenue basis for allocating joint cost?

**Question 57**

Adam, the management accountant of Mark Limited, has on file the costs per equivalent unit for the company's process for the last month but the input costs and quantities appear to have been mislaid.

Information that is available to Adam for last month is as follows:

- Opening work in progress: 100 units, 30% complete
- Closing work in progress: 200 units, 40% complete
- Normal loss: 10% of input valued at £2 per unit
- Output: 1,250 units

The losses were as expected and Adam has a record of there being 150 units scrapped during the month. All materials are input at the start of the process. The cost per equivalent unit for materials was £2.60 and for conversion costs was £1.50.

Mark Limited uses the FIFO method of stock valuation in its process account.

Required:

(a) Calculate the units input into the process. (2 marks)
(b) Calculate the equivalent units for materials and conversion costs. (4 marks)
(c) Using your answer from (b) calculate the input costs. (4 marks)
Question 58

Duddon Ltd makes a product that has to pass through two manufacturing processes, I and II. All the material is input at the start of process I. No losses occur in process I but there is a normal loss in process II equal to 7% of the input into that process. Losses have no realisable value.

Process I is operated only in the first part of every month followed by process II in the second part of the month. All completed production from process I is transferred into process II in the same month. There is no work in progress in process II.

Information for last month for each process is as follows:

Process I
- Opening work in progress: 200 units (40% complete for conversion costs) valued in total at £16,500
- Input into the process: 1,900 units with a material cost of £133,000
- Conversion costs incurred: £93,500
- Closing work in progress: 50% complete for conversion costs

Process II
- Transfer from process I: 1,800 units
- Conversion costs incurred: £78,450
1,650 completed units were transferred to the finished goods warehouse.

Required:
(a) Calculate for process I:
   (i) the value of the closing work in progress; and
   (ii) the total value of the units transferred to process II. (4 marks)
(b) Prepare the process II account for last month. (4 marks)
(c) Identify TWO main differences between process costing and job costing. (2 marks)

“A journey of a thousand miles begins with a single step”
— Confucius
Chapter 6: Process Costing

Question 59

A company which operates a process costing system had work in progress at the start of last month of 300 units (valued at £1,710) which were 60% complete in respect of all costs.

Last month a total of 2,000 units were completed and transferred to the finished goods warehouse. The cost per equivalent unit for costs arising last month was £10. The company uses the FIFO method of cost allocation.

What was the total value of the 2,000 units transferred to the finished goods warehouse last month?

Question 60

Maybud Ltd operates Process X which creates two joint products, A and B, in the ratio of 3:2 by volume. There is no work in progress. The following information relates to Process X for last month:

(i) 80,000 litres of raw materials with a total cost of £158,800 were input into the process and conversion costs were £133,000.

(ii) A normal process loss of 5% of the input was expected. An actual loss of 5,500 litres was identified at the end of the process. Losses have a realisable value of 75p per litre.

It is company policy to apportion joint costs to products using the net realisable value method. After Process X, both product A and product B are further processed at a cost of £2 per litre and £3 per litre respectively. The final selling prices of the products are as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>£ per litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
</tr>
</tbody>
</table>

Required:

(a) Prepare the process account for last month including the output volume and cost of products A and B separately. (7 marks)

(b) Explain clearly how an abnormal gain arises in a process. Indicate where it would appear in a process account and how it would be valued. (3 marks)

Question 61

A company operates a process costing system using the first in first out (FIFO) method of valuation. No losses occur in the process.

The following data relate to last month:

<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>Degree of completion</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening work in progress</td>
<td>100</td>
<td>60%</td>
<td>£680</td>
</tr>
<tr>
<td>Completed during the month</td>
<td>900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closing work in progress</td>
<td>150</td>
<td>48%</td>
<td></td>
</tr>
</tbody>
</table>

The cost per equivalent unit of production for last month was £12.

What was the value of the closing work in progress?

What was the total value of the units completed last month?
**Question 62**

At the end of manufacturing in Process I, product K can be sold for £10 per litre. Alternatively product K could be further processed into product KK in Process II at an additional cost of £1 per litre input into this process. Process II is an existing process with spare capacity in which a loss of 10% of the input volume occurs. At the end of the further processing, product KK could be sold for £12 per litre.

Which of the following statements is correct in respect of 9,000 litres of product K?

**Question 63**

Yeomen Ltd uses process costing and the FIFO method of valuation. The following information for last month relates to Process G, where all the material is added at the beginning of the process:

- **Opening work-in-progress:** 2,000 litres (30% complete in respect of conversion costs) valued in total at £24,600 (£16,500 for direct materials; £8,100 for conversion).
- **Costs incurred:**
  - Direct materials: £99,600 for 12,500 litres of input
  - Conversion: £155,250
- **Normal loss:** 8% of input in the period. All losses, which are incurred evenly throughout the process, can be sold for £3 per litre.
- **Actual output:** 10,000 litres were transferred from Process G to the finished goods warehouse.
- **Closing work-in-progress:** 3,000 litres (45% complete in respect of conversion costs).

**Required:**

(a) Prepare the Process G Account for last month in £ and litres.  
(b) Identify TWO types of organisation where it would be appropriate to use service (operation) costing. For each one suggest a suitable unit cost measure.
**Question 64**

Luiz Ltd operates several manufacturing processes in which stocks of work-in-progress are never held. In process K, joint products (P1 and P2) are created in the ratio 2:1 by volume from the raw materials input. In this process a normal loss of 4% of the raw materials input is expected. Losses have a realisable value of £5 per litre. The joint costs of the process are apportioned to the joint products using the sales value basis. At the end of process K, P1 and P2 can be sold for £25 and £40 per litre respectively.

The following information relates to process K for last month:

<table>
<thead>
<tr>
<th>Raw materials input</th>
<th>90,000 litres at a total cost of £450,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual loss incurred</td>
<td>4,800 litres</td>
</tr>
<tr>
<td>Conversion costs incurred</td>
<td>£216,000</td>
</tr>
</tbody>
</table>

**Required:**

(a) Prepare the process K account for last month in which both the output volumes and values for each joint product are shown separately. (7 marks)

The company could further process product P1 in process L to create product XP1 at an incremental cost of £3 per litre input. Process L is an existing process with spare capacity. In process L a normal loss of 8% of input is incurred which has no value. Product XP1 could be sold for £30 per litre.

**Required:**

(b) Based on financial considerations only, determine, with supporting calculations, whether product P1 should be further processed in process L to create product XP1. (3 marks)

**Question 65**

A business uses process costing to establish stock valuations and profitability of its products. Output from the process consists of three separate products: two joint products and a by-product. Details of the process is as follows:

**Input costs:**

<table>
<thead>
<tr>
<th>Materials</th>
<th>£45,625 for 12,500 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour</td>
<td>£29,500</td>
</tr>
<tr>
<td>Overheads</td>
<td>£26,875</td>
</tr>
</tbody>
</table>

The process is expected to lose 20% of the input. This is sold for scrap for £4 per unit.

The following details relate to the output from the process:

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>% of output</th>
<th>Final sales value per unit</th>
<th>Further costs to complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Joint</td>
<td>50%</td>
<td>£20</td>
<td>£10</td>
</tr>
<tr>
<td>B</td>
<td>Joint</td>
<td>40%</td>
<td>£25</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>By-product</td>
<td>10%</td>
<td>£2</td>
<td></td>
</tr>
</tbody>
</table>

Joint costs are allocated on the basis of net realisable value at split-off.

**Required:**

(a) Establish the total cost of the output from the process. (4 marks)

(b) Calculate the profit per unit for each of the joint products, A and B. (6 marks)
Question 66

DFK2 Ltd. operates a process costing system, where the output of Process 1 is transferred to Process 2. The following information relates to Process 1 for the period just ended:

- Material input: 10,000 kgs at €5 per kg
- Direct labour: 5,000 hours at €12 per hour
- Production overheads: Absorbed at 100% of direct labour cost
- Normal loss: 5% of input
- Scrap value: €7.50 per kg
- Actual loss: 600 kgs

There was no opening or closing work-in-progress in Process 1 in the period.

What was the value of the output transferred to Process 2 during the period?

Question 67

Croker Ltd uses process costing techniques for its monthly valuations of output. There are no stock holdings and raw material input for the month was 2,000 units costing €5 each. Conversion costs were €17,400 and 150 units were recorded as actual losses. Normal losses are expected to be 10% of input and can be sold as scrap for €2 each.

The value of one unit of output using process costing principles (rounded to the nearest cent) is:

Question 68

Plato Ltd uses process costing to value its output. The following information is available for ‘Process 1’ for the month of June:

- Materials (1,000 units inputted): €5,000
- Conversion costs: €6,000
- Normal loss: 10%
- Actual loss: 120 units
- Scrap value of units: €2

There is no opening or closing stock.

The value of one unit of output for ‘Process 1’ is:
Question 69

Singha Industries Ceylon (SIC) refines common raw materials to manufacture three joint products - Product A, Product B and Product C and one by-product namely Product D. At present the joint costs are allocated to the products based on weight (physical unit method). The following common costs have been incurred for the past 6 months.

- Total materials utilised = Rs. 64.474 million
- Direct labour = Rs. 6 million
- Manufacturing overheads = Rs. 5 million

The output and their market prices during past 6 months were:

<table>
<thead>
<tr>
<th>Product</th>
<th>Output (kgs)</th>
<th>Market price (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>158,000</td>
<td>275</td>
</tr>
<tr>
<td>Product B</td>
<td>94,800</td>
<td>425</td>
</tr>
<tr>
<td>Product C</td>
<td>47,200</td>
<td>520</td>
</tr>
<tr>
<td>Product D (by-product)</td>
<td>9,480</td>
<td>50</td>
</tr>
</tbody>
</table>

The output proportion and the costs are expected to remain unchanged during the next year.

You have recently joined SIC and are in the process of developing an appropriate joint cost allocation system. A friend of yours has advised you to use the sales value at the split off point for this allocation.

Further processing of product A

Product A can be further processed to manufacture product E at a variable processing cost of Rs.50 per kg of product E produced. Product E can be sold at Rs.330 per kg. Further processing will increase the fixed processing cost by Rs.0.2 million per month. During further processing 5% of the input will be wasted. However, at present the management is not producing product E because of low cost imported substitutes.
Chapter 6: Process Costing

You are required to;

(a) Calculate the cost per unit based on physical unit method and the profit generated for the past six months. (4 marks)

(b) Evaluate the management’s decision not to further process product A to produce product E. (3 marks)

(c) Evaluate the validity of your friend’s advice on the cost allocation model. (2 marks)

(d) Calculate the cost of each product allocating the joint costs based on the market value at the split off point. (3 marks)

(e) It has been rumoured that the government is going to impose an import duty of Rs. 100 per kg on imported substitutes for product E. Advise the management whether they should manufacture product E in the future. (3 marks)

(Total 15 marks)

“Don’t worry about failure, you only have to be right once.”

-Drew Houston, CEO of Dropbox
All-Chemi (Pvt) Ltd., (ACL) is a chemical importing and trading company and is planning to purchase a chemical refinery system to manufacture some of its chemicals which are currently being imported. This machinery is capable of producing three main types of chemicals (joint products) namely Chemical A, Chemical B and Chemical C and one by-product namely Chemical D by processing common raw materials as given below.

The following details have been furnished in relation to this refinery system.

<table>
<thead>
<tr>
<th>Output</th>
<th>Expected Composition of Output (as a % of inputs)</th>
<th>Market Price per kg (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical A</td>
<td>50%</td>
<td>170</td>
</tr>
<tr>
<td>Chemical B</td>
<td>30%</td>
<td>240</td>
</tr>
<tr>
<td>Chemical C</td>
<td>15%</td>
<td>310</td>
</tr>
<tr>
<td>Chemical D (by-product)</td>
<td>3%</td>
<td>40</td>
</tr>
<tr>
<td>Total waste</td>
<td>2%</td>
<td>-</td>
</tr>
</tbody>
</table>

The main input materials are X and Y, both added to the system at the beginning, in the proportion of 4:1 respectively.

The prices of X and Y are Rs. 85 per kg and Rs. 150 per kg, respectively. 2% of the input will anyway be disposed as waste at the end of the processing time, with no commercial value. However waste has to be incinerated/burned by a Central Environmental Authority (CEA) approved incinerator who currently charges Rs. 140 to incinerate 1kg of such waste.

The capacity of refinery system is 100 metric ton of input materials per month. Following joint costs have been estimated at this level of processing.

   Labour costs      - Rs. 1,040,000 per month.
   Total overhead costs - Rs. 1,200,000 per month (Excluding depreciation).

Cost of the refinery system is Rs. 26 million and can be used for 5 years at the end of which the used system can be sold for Rs.5 million. Depreciation is to be charged to the accounts on straight line basis. ACL’s current sales quantities of Chemical A, B and C are more than the quantities that can be manufactured from the new system at its full capacity level.

Production manager has suggested that the above joint cost can be apportioned to each chemical based on the weight of output.

**You are the assistant management accountant of ACL and require to;**

(a) Prepare a statement showing the profit for a month from the proposed refinery system. Based on this statement advise the management on the purchase of the refinery system.

(7 marks)
Chapter 6: Process Costing

(b) If the company decides to buy the refinery system:

i. Calculate the unit cost of each chemical manufactured in the refinery system apportioning joint cost based on the sales value method.

(3 marks)

ii. Explain how would you justify the superiority of sales value method for joint cost apportionment in the above (i) scenario, than the production manager’s proposal.

(2 marks)

(c) The Chemical 'A' can be further processed to produce Chemical 'AA' the current price of which is Rs. 220 per kg. However a proportion of 2% (on input quantity) of Chemical 'A' will be wasted during the processing and has to be incinerated.

Special equipment has to be hired for further processing and the total cost of further processing per month including cost of hire of this equipment, in order to process entirety of Chemical 'A' to Chemical 'AA', would be Rs. 1.7 million per month (excluding incineration cost at Rs. 140 per kg.)

Advise the management whether Chemical 'A' should be further processed (Clearly show your calculations).

(3 marks)
(Total 15 marks)
Question 71

(a) Compare process costing and job costing with examples. (3 marks)

(b) Aichi Ltd is a manufacturing organisation with two sequential processes namely Process I and Process II. Output (measured in units) of Process I is transferred to Process II where they are further processed with additional raw materials. Output of Process II is transferred as finished goods. Information for the month of August 2013 is as follows:

<table>
<thead>
<tr>
<th>Process II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening work in progress (WIP)</td>
<td>200 Units</td>
</tr>
<tr>
<td>Transferred from Process I (10,000 units) (Rs.)</td>
<td>47.5 million</td>
</tr>
<tr>
<td>Additional materials (Rs.)</td>
<td>11.54 million</td>
</tr>
<tr>
<td>Labour (Rs.)</td>
<td>4.715 million</td>
</tr>
<tr>
<td>Overheads (Rs.)</td>
<td>2.829 million</td>
</tr>
<tr>
<td>Transferred to finished goods</td>
<td>9,300 Units</td>
</tr>
<tr>
<td>Closing work in progress (WIP)</td>
<td>300 Units</td>
</tr>
</tbody>
</table>

Output transferred from Process I will be introduced to Process II at the commencement. Additional raw material is introduced only when the process II is 55% complete. Normal losses are expected to be 5% of input units transferred from Process I. Losses are deemed to arise at the end of the process II and can be sold for Rs. 1,000 per unit.

Opening work in progress (WIP) in Process II is 60% completed with regard to labour and overheads. Closing WIP in process II is 50% completed in respect of labour and overheads. Products are completed on first in first out method (FIFO).

(i) Calculate the normal and abnormal losses made during the month of August. (2 marks)
(ii) Calculate the quantity of the output in August that has been completed out of the units introduced from process I during the same month. (that is excluding the units produced by completing the opening WIP).

(1 mark)

(iii) Prepare a statement of equivalent units for the month of August and thereby calculate cost per equivalent unit under each cost component.

(7 marks)

(iv) Prepare the normal and abnormal loss accounts.

(2 marks)

(Total 15 marks)
Chapter 6: Process Costing

Question 72

(a) Explain what is meant by each of the following process costing terms:

(i) Normal loss (2 marks)
(ii) Abnormal loss (2 marks)

(b) The input to a process in May 2012 was 4,000 units. Normal loss is 5% of input. Costs of production during May were:

£
Direct materials 7,400
Direct labour 2,600
Production overhead 5,200

Actual output during May 2012 was 3,560 units.

Required:

(i) Calculate the cost per unit of output. (3 marks)
(ii) Prepare the Process Account for the month of May 2012. (8 marks) (Total 15 marks)

Question 73

In the context of process costing, define both joint products and by-products. State three methods of apportioning the production costs of joint products. (7 marks)
Chapter 6: Process Costing

Question 74

The valuation of work-in-progress is an important part of process costing.

Explain what is meant by the term Equivalent Units in relation to process costing.

Question 75

A company starts to manufacture on 1 April 2009. During the month of April the company commences the production of 40,000 units. At the end of April there are 3,000 units still in process.

Additional information:

(1) All materials have been input to the process.

(2) Work-in-progress is only one-third complete as regards labour.

(3) Costs for the period are: materials $20,000 and labour $19,000.

Required:

Calculate both the cost of finished production and the cost of work-in-progress.

(7 marks)

“Don’t compare yourself with anyone in this world...if you do so, you are insulting yourself.”

~ Bill Gates
**Question 76**

Glossy Ltd produces a brand of shampoo called ‘Gleamsoft’. It blends a liquid soap with a special ingredient (which has no significant volume). The resulting liquid is then put into bottles costing £0.20 each. Each bottle of Gleamsoft contains one third of a litre of shampoo and sells for £3.

The data given below refers to the month of May:

**Inputs into the blending process:**

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid soap</td>
<td>15,246</td>
</tr>
<tr>
<td>Special ingredient</td>
<td>30,780</td>
</tr>
<tr>
<td>Process labour</td>
<td>5,259</td>
</tr>
</tbody>
</table>

The output from the process was 10,800 litres.

Overhead is charged to the process at 100% on Process labour cost.

The blending process normally causes losses of about 10% of input liquid soap. The losses take the form of a thicker soap which is sold for £1 per litre.

The monthly budgeted **maximum** output of the process is 10,800 litres.

**Required:**

(a) (i) Prepare the process account for the blending process for the month of May.

(ii) Calculate the normal profit per bottle of shampoo.  \( \text{(14 marks)} \)

---

**EBay may be a shark in the ocean, but I'm a crocodile in the Yangtze River. If we fight in the ocean, we lose, but if we fight in the river, we win,**

— Jack Ma —
Question 77

Maxpen plc produces paint by combining chemicals in a continuous process. During week commencing 4 May 2009, the following results were recorded:

- Material used was 10,000 litres at a cost of £6.50 per litre.
- 10 employees worked 40 hours each at a rate of £7.00 per hour.
- Fixed overheads are absorbed at a rate of 150% of direct labour cost.
- Finished goods produced was 8,200 litres and a further 1,200 litres remained as work in progress. It was estimated that the work in progress was 60% complete.
- There was no opening work in progress.

The company expects to achieve a normal loss of 10% of material input. There is no recoverable waste material with any scrap value.

Required:

(a) Calculate the expected cost per litre of paint produced. (3 marks)

(b) Calculate the value of the abnormal loss or gain, if any, and explain how this will be treated in the accounts. (5 marks)

(c) Draw up the process account for week commencing 4 May 2009. (8 marks)

(d) If the normal loss material could be retrieved and sold for £1.80 per litre, calculate the revised unit cost of paint produced. (4 marks)

(e) Give examples of circumstances that might have caused the abnormal loss to occur and recommend to management what action should be taken if these losses occur regularly. (5 marks)

(Total 25 marks)
### Question 78

Able Ltd produces one product, which passes through two processes, the output from Process 1 becoming the input to Process 2.

For April 2005 the following figures are available:

<table>
<thead>
<tr>
<th></th>
<th>Process 1</th>
<th>Process 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input 5,000 units</td>
<td>$20,000</td>
<td></td>
</tr>
<tr>
<td>Transfer from Process 1</td>
<td>$8,600</td>
<td>3,800 units</td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td>$11,700</td>
</tr>
<tr>
<td>Overhead</td>
<td>50% Labour</td>
<td>50% Labour</td>
</tr>
<tr>
<td>Normal Loss</td>
<td>10% Input</td>
<td>5% Input</td>
</tr>
<tr>
<td>Closing WIP</td>
<td>400 units</td>
<td>200 units</td>
</tr>
<tr>
<td>Output</td>
<td>3,800 units</td>
<td>3,500 units</td>
</tr>
<tr>
<td>Scrap value of losses</td>
<td>$1.3 per unit</td>
<td>$3.5 per unit</td>
</tr>
</tbody>
</table>

Closing Work in Progress in both processes is complete as to materials, and 50% complete as to labour and overhead costs.

All the losses from Process 1 were sold at $1.3 per unit and all of those from Process 2 were sold at $3.5 per unit.

**Required:**

Prepare the following:

(a) Process 1 account (9 marks)
(b) Process 2 account (9 marks)
(c) Abnormal Loss account (2 marks)
(d) Abnormal Gain account (2 marks)
(e) Normal Loss account (3 marks)  
(Total 25 marks)
Question 79

(a) In the context of Process Costing, define
   (i) Normal loss
   (ii) Abnormal loss

   State the treatment of both in a system of process accounts. (6 marks)

(b) State the three methods that are commonly used to apportion joint processing costs over joint products that emerge from a single process. (7 marks)
Question 80

Dyer Ltd manufactures four products (W, X, Y and Z) in a single process. The joint costs of the process for a given period are $104,000.

The company produced and sold the following quantities in the period:

- W: 700 kilos, Selling Price: $50 per kilo
- X: 800 kilos, Selling Price: $60 per kilo
- Y: 1,000 kilos, Selling Price: $60 per kilo
- Z: 700 kilos, Selling Price: $30 per kilo

Required:

(a) Calculate the profit for each of the four products, using the following methods of apportionment for the joint production costs (work to the nearest $).

(i) Weight of output method

(ii) Sales value of output method

(b) The company is considering further processing of Product Y. The cost of the further processing would be $6 per kilo. There would be a 10% loss in the process and the new product would be sold for $70 per kilo.

(i) Calculate the profit or loss that would occur if the further processing is carried out.

(ii) Calculate the minimum selling price that would make further processing worthwhile.
Question 81

Lather Ltd operates a single process to manufacture soap.

The following figures relate to a recent period.

<table>
<thead>
<tr>
<th>Input</th>
<th>Material</th>
<th>20,000 kilos at $5 per kilo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labour</td>
<td>16,000 hours at $6.25 per hour</td>
</tr>
<tr>
<td></td>
<td>Overhead</td>
<td>16,000 hours at $3 per hour</td>
</tr>
</tbody>
</table>

There is an expected loss of 5% of input weight, which can be sold for $1.2 per kilo.

The actual output for the period was 18,800 kilos and the closing work in progress was 1,000 kilos, which was complete as to material and 50% complete as to labour and overhead.

**Required:**

(a) Prepare, showing all relevant workings:

   (i) The main process account (6 marks)

   (ii) The normal loss account (4 marks)

   (iii) The abnormal gain account. (6 marks)

(b) The finished output is divided in the ratio 3:2 to produce the “Domestic” and the “Fragrant” brands. Perfume is added to the Fragrant brand at a cost of $0.5 per kilo. Packaging costs are $0.2 per kilo for the Domestic brand, and $0.4 per kilo for the Fragrant brand. If each kilo of finished output yields twenty bars of soap, calculate the cost of one bar of soap for each of the Domestic and the Fragrant brand. (9 marks) (Total 25 marks)
Question 82

In the context of process costing, define:

(i) Equivalent units;
(ii) Normal loss;
(iii) Abnormal loss;
(iv) Joint products;
(v) By products. 

(10 marks)
Question 83

MeeWood Company produces products through two processes: cutting and assembly. At the beginning of July 2012, the cutting process has opening WIP of 200 units at $8,102 and its breakdown was:

<table>
<thead>
<tr>
<th>Degree of Completion</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>100%</td>
</tr>
<tr>
<td>Labour</td>
<td>30%</td>
</tr>
<tr>
<td>Overheads</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

In July 2012, 1,000 units of materials were added to the cutting process. Due to limitations of the cutting machine, 10% of materials added to the cutting process were expected to become loss with a scrap value of $9 per unit. It is the company’s cost accounting policy to deduct the scrap value of normal losses from the cost of materials in the current process. By end of July, 940 units of finished cutting process were transferred out to the next process: assembly. 100 units remained in closing WIP and their degrees of completion of individual inputs were:

| Materials | 100%  |
| Labour    | 60%   |
| Overheads | 40%   |

Costs incurred in July were:

| Materials       | $20,700 |
| Labour          | $5,074  |
| Overheads       | $10,920 |

Required:
Prepare the following accounts for the month of July 2012 using the weighted average method and first-in-first-out method:
(i) Process account; and
(ii) Abnormal loss account

Detailed workings on equivalent units and the cost per equivalent unit of individual cost elements must be shown.