Dr.Babasaheb Ambedkar Open University

DACA
DIPLOMA IN ADVANCE COST ACCOUNTING

Block

2

Various forms of Costing

Unit –5

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Unit : 5 : Job Costing, Process Costing, Singal Costing, Batch Costing, Operating Costing, Contract Costing

Introduction

This chapter mainly deals with the various ways used for the costing products and services in different circumstances. Costing of products and services can be done in various ways depending upon the circumstances like unit costing, job costing, operating costing, batch costing, contract costing, process costing, operating costing etc. We will discuss during this chapter one by one about various methods of recording costs.

Structure of the Chapter:

5.1 Objectives:

By the end of this chapter the student will learn about,

- Basic understanding and calculation of Job costing
- Basic understanding and calculation of Process costing
- Basic understanding and calculation of Batch costing
- Basic understanding and calculation of Singal costing
- Basic understanding and calculation of Operating costing
- Basic understanding and calculation of Contract costing

5.2 Singal or Output Costing:

Unit cost is a method of costing used in those industries, which are engaged in manufacturing exclusively one homogeneous product or a few grades of the same product. The unit cost is the average cost, that is, the total cost divided by the number of units produced. It is also referred to as single/output costing. The examples of industries in which this type of costing is applicable are cement, paper, sugar, steel, quarries, brickworks, and breweries.

Cost Sheet

A cost sheet or production statement is the statement that provides a logical, detailed and systematic presentation of various elements of cost information obtained through the cost records. It also includes the figures of sales revenue and profits.

Production Account

Production account is an accounting presentation (ledger account shape) of the information contained in the production statement. In financial accounting, it is known by the name of manufacturing account.

In preparing the cost sheet, the following items need special attention.

Salvage Value of Scrap Material

Cost of production should be reduced by the sale proceeds of scrap. In case material is not processed, sale proceeds of such materials should be deducted from the cost of materials issued. Where materials have undergone manufacturing process, the sale proceeds from such scrap should be deducted from the factory cost.

Defective Product

Defective products can sometimes be made saleable after incurring extra expenditure. When such defects are caused by normal reasons, the additional expenditure on salvaging these products is included as a part of factory cost; but in case of abnormal reasons, the cost of rectification of these products is transferred to the costing profit and loss account.

By-Product

The sale proceeds realised from by-products is deducted from the factory cost.

Work-in-Process

The adjustment for opening and closing work-in-process should be carried out at the appropriate stage (prime cost or work cost) in preparing the statement of cost of production.

The formats of cost sheet/production statement and production account are given in below.

Cost Sheet for the Period.....

(Units produced)

Particulars	Last Period		Current Period	
	Total cost	Unit cost	Total cost	Unit cost
Direct materials consumed				
Direct wages				
Other direct/chargeable expenses	—	—	—	—
Prime Cost				
Add factory or works overheads (specify each item)	—	—	—	—
Factory Cost, (gross)				
Add opening work-in-process				
Less closing work-in-process	—	—	—	—
Factory Cost (net)				
Add administrative overheads				
Cost of Production				
Add opening stock of finished goods				
Less closing stock of finished goods	—	—	—	—
Cost of Goods Sold				
Add selling overheads (specify each item)	—	—	—	—
Cost of Sales				
Add profit as per cent of cost price or selling price	—	—	—	—
Safes Revenue (Total)	—	—	—	—

Production Account for the Period.....

Particulars	Dr Amount	Particulars	Cr Amount
To direct materials:	—	By prime cost c/d	—
Opening stock			
Add purchases			
Add carriage on purchase			
Less closing stock			
To direct labour			
To other direct/chargeable expenses			
To prime cost b/d		By closing stock of work-in-process	
To factory overheads (specify each item)		By factory cost c/d	
To opening stock of work-in-process			
To factory cost b/d		By cost of production c/d	
To administrative overheads (specify each item)			
To opening stock of finished goods		By closing stock of finished goods	
To cost of production b/d		By cosi of goods sold c/d	
To cost of goods sold b/d		By cost of sales c/d	
To selling overheads (specify each item)			
To cost of sales b/d		By sales	
To profit (balancing figure)			

Bid Price

Cost sheet or statement of cost of production and profit is a useful means of determining the bid price to be quoted for a specific tender. In preparing such a statement, probable changes in the input prices/rates should be taken into account. Moreover, fixed costs should be ignored if the tender output can be met out of the existing plant capacity of the firm.

5.3 Job Costing

Job Costing is used when single units are being produced. The aim of Job Costing is to determine the cost of a specific job. Jobs are undertaken according to customer's specifications. The most common use of Job Costing is by small factories in the engineering industry, printing, machine tool manufacturing, foundries, repair shops, garages and several such other industries where jobs are undertaken according to the requirements of customers, Cost unit is each job. Specific order costing is "the category of basic costing methods applicable where the work consists of separate contracts, jobs or batches, each of which is authorised by a specific order or contract" (ICMA definition).

Job Costing is 'that form of specific order costing which applies where work is undertaken to customer's special requirements. As distinct from contract costing, each

job is of comparatively short duration' (ICMA definition).

As the name implies, job-order costing refers to a costing system that determines the production cost of individual orders/jobs. Under this system, costs are assigned to, and accumulated for, each job. This section illustrates job costing as a method of cost accumulation. Mainly such type of costing technique is used when costing is required to be done for a particular job or order. The job-order cost system refers to the procedures to accumulate costs when work is performed pursuant to an order, and when products are manufactured or services rendered to meet individual customers' specifications. Here, the cost should be recorded separately for each job. The order may be for a single item or a number of identical items manufactured as a group, that is, a batch. Moreover, since each job requires varying amounts of materials and labour and different levels of skills or attention, the cost of one job would differ from another. Thus, the distinguishing feature of job-order costing is the ability to identify costs with a specific project/job/order or group of units.

Following is a performa job cost sheet.

Job Cost Sheet

	Job No.
Customer name	Date started
and address	Date promised
Description	Date finished
Quantity	Special remarks, if any

	Materials			*Labour*			*Overheads*	
Quantity	Rate	Amount	Hours	Rate	Amount	Hours	Rate	Amount
Department 1								
Department 2								
Department 3								

Cost Summary

		Labour	*Overheads*	*Total*	
	Materials				
				Actual	*Estimate*
Department 1					
Department 2					
Department 3					
Job order price					
Profit (Loss)					

Discrepancies between actual and estimated costs are explained below:

1.

2.

3.

Over-applied or Under-applied Manufacturing Overheads When predetermined overhead rate is used as the basis of absorption of overheads, it is seldom that the total overhead costs applied to jobs in a given period are equal to the total overhead costs of that period. When the applied overhead exceeds the actual, it is referred to as over-applied/absorbed overhead. It is known as under-applied/absorbed in case the applied is less than the actual. The difference between the actual and applied manufacturing overhead costs is designated as the *variance,*

Disposition of Variance Overhead variances may be disposed of by following either of the two methods: (i) They may be assigned to the income statement of the current period by charging the entire amount to the cost of goods sold account; or (ii) They may be considered as the cost of production of the current period and accordingly may be pro-rated to work-in-process, finished goods and cost of goods sold. The treatment would depend on the nature of such variance.

If the variance has been an outcome of unusual events of the current period, it should be charged to the cost of goods sold. But if such a variance has been caused by errors in estimation or fundamental changes in cost structure, it should be pro-rated over work-in-process, finished goods and cost of goods sold.

The following journal entries would be required to give effect to manufacturing overheads.

Factory ledger

1. Debit Factory Overhead Control A/c, and Credit General Ledger (For indirect manufacturing costs incurred).
2. Debit Work-in-Process/Individual Jobs A/c, and Credit Factory Overhead Control A/c (For charging indirect overheads to jobs).
3. Debit Cost of Goods Sold A/c, and Credit Factory Overhead Control A/c

   (For charging under-applied overheads to cost of goods sold account under first method). Entry number (3) would be reversed in the case of over-applied overheads.
4. Debit Work-in-Process/Individual Jobs Debit Finished Goods inventory Debit Cost of Goods Sold, and

Credit Factory Overhead Control A/c

(For charging under-applied overheads under pro-rating method). Entries (3) and (4) would be reversed in the case of over-applied overheads. General ledger

1. Debit Factory Ledger A/c, and Credit Various Credits (Accounts Payable), Credit Accumulated Depreciation, and so on.

(For indirect manufacturing costs incurred).

For subsequent transactions no entry is required in the general ledger as these transactions do not affect the general ledger accounts.

Accounting for Completed Jobs Normally, in a job costing system when work on a job is completed, it would be available for delivery to a customer. At the time of

completion, all work-in-process account balances pertaining to that job are transferred directly to cost of goods sold account. In case, production is made in anticipation of future sale, relevant costs from work-in-process will be transferred to the finished goods inventory account. The journal entries in the factory ledger would be as follows:

1. ***Production is as per order***

Debit Cost of Goods Sold A/c, and

Credit Work-in-process A/c

(Transfer of cost on completion of the job).

2. Production is for future sale

(a) Debit Finished Goods Inventory A/c, and Credit Work-in-process A/c

(b) *At the time of sale*

Debit Costs of Goods Sold A/c, and Credit finished goods inventory.

5.4 Operating Costing

Operation costing is "the category ofbasic costing methods applicable where standardised goods or services result from a sequence of repetitive and more or less continuous operations or processes to which costs are charged before being averaged over the units produced during the period" (ICMA Definition).

Operating costing is used for service industries. The term operating costing is applied to unit costing of services as opposed to products. It is applicable where standardised services are provided either by an undertaking or by a service cost centre within an undertaking. E.g. road and rail transport companies, electricity undertakings, hospitals, theatres;

Operating costing is essentially a part of unit costing. Like unit costing, the cost per unit in operating costing is based on average cost. Example of units to express average cost are as follows:

Organisation	Cost unit
Transport undertakings	Passenger-km (passenger traffic) or Tonne-km (goods transport)
Electricity boards/organisation	Kilowatt-hours
Hospitals	Patient-days, outpatients treated, cost per major or minor surgical operation
Boiler houses	Quantity (kg or Ib) of steam generated
Canteens	Meals served; cups of tea sold.

Corresponding to the fixed costs, variable costs and semi-variable costs in manufacturing organsiations, the operating costs in service organisations are generally categorised into three groups, namely standing charges, running costs and repairs and maintenance.

Standing Charges

Standing charges are those, which are incurred irrespective of the mileage run. Included in this category are the following expenses:

1. License fees
2. Insurance premium
3. Road, tax
4. Garage costs and administration

Running Costs

Running costs are those which vary more or less in direct proportion to the mileage run. The following is a list of such expenses:

1. Cost of fuel (diesel, petrol etc.)
2. Lubricants, grease and oil
3. Repairs and maintenance (strictly semi-variable)

In transport, the total operating cost should be determined with reference to each vehicle under suitable cost headings, namely, standing charges, running charges and maintenance charges. The passenger-km or tonne-km can be conceived as a function of the following variables:

1. The number of vehicles (fleet)
2. The carrying capacity of the vehicle in terms of number of passengers/freight
3. Distance travelled
4. Number of days on an average for which the vehicle is likely to be in operation
5. Number of trips -in a day; going and coming should be considered as two trips
6. Passenger/weight actually carried on an average

5.5 Batch Costing

It is a natural type of system to be utliised in situations when a firm manufactures products in readily identifiable batches or definite lots.

The I.C.M.A. London has defined batch costing as "that form of specific order costing which applies where similar articles are manufactured in batches either for sale or for use within the company".

In most cases, this costing is similar to job-costing. "A batch is a cost unit which consists of a gr‹iup of similar articles, which maintain its identity throughout one or more stages of production:" Hence, the cost recording procedure in the batch costing system is similar to that of the job costing system.

Batch costing is a form of job costing in which a batch of identical products is taken as the cost unit. A convenient batch of production is treated as a job. Then the batch cost is used to determine the unit cost of articles. It is a modification of job costing. It is used when manufacturing consists of repetitive production and certain number of articles are manufactured in one batch. The cost procedure is similar to job costing. Here also, a production order number is alloted for each batch and costs are collected in a similar way as followed in job costing.

For identification purposes, each batch is required to be numbered in batch costing as each job is numbered in the job costing system. Similarly, direct material, direct labour and any other direct costs which can be traced directly to a specific batch are charged to it and indirect manufacturing overheads are applied at the predetermined rate. Thus, the normal principles of job-order costing system apply to batch costing also. However, there are some points of distinction between the two.

The unique feature which distinguishes job costing from batch costing is that, while in the former production is tailored to meet the customers' specifications, in the latter, in general, goods are produced to inventory them for future sale to customers.

5.6 Contract Costing

Contract costing is 'thatform of specific order costing which applies where work is undertaken to customers' special requirements and each order is of a long duration' (ICMA Definition).

It is a specialized costing system, which applies to construction works. This section outlines and illustrates contract costing. It first discusses the cost accumulation process in contracts, which are completed in one accounting year. It is followed by a discussion of determination of profit on 'incomplete contracts. *Cost plus* contracts are covered in the last part.

Contract Accounts

A separate account is kept for each individual *contract* for the purpose of cost accumulation and profit determination. Each contract account constitutes the *cost unit* as well as the *cost centre.* Generally, under other costing systems, cost is allocated first to the cost centre (may be a department or process) and then to the individual jobs (cost units). The nature of contract work is such that most of the costs (material, labour and overheads) are directly traceable to the contract. All direct costs are debited to the contract account; indirect/overhead costs relating to the overall administration and other

central services are apportioned to each contract on some predetermined equitable basis. On completion of the contract, the contract price is credited to the contract account; excess credit and excess debit respectively represent profit and loss from the contract.

Proforma Contract Account

Dr.		Cr.	
Particulars	*Amount*	*Particulars*	*Amount*
To materials (direct)		*By* materials returned to store	
To materials (issued from the store)		By materials transferred to another contract site	
To wages and salaries		By materials sold	
To sub-contract payments To other direct expenses		By abnormal loss (theft of materials, loss of plant due to fire, and so on.)	
To indirect expenses (apportioned share of overhead)		By closing stock of materials	
To plant and equipment (purchase price/book value)		By plant and equipment (closing balance)	
To profit and loss A/c (surplus)		By profit and loss A/c (deficiency)	

Profit Determination on Incomplete Contracts

The determination of profit in case of contracts which are not completed in one accounting year is an important aspect of contract accounting.

The actual profits will be known only on completion of the contract, but a contractor would be interested in determining the profits periodically to even out fluctuations in the profits of the firm. When a part/ proportion of profits is not taken into account each year, the contractor's annual accounts may show low profits (or even a loss) for each year in which no major contract(s) is/are completed and exceptionally high profits in any year in which a large contract(s) is/are completed. Thus, there would be wide fluctuations in the contractor's annual profits making inter-year profits incomparable.

Based on the foregoing conventions, the determination of profit on incomplete contracts to be credited to profit and loss account can be summarised as follows:

(a) When work certified is 25 per cent or more but less than 50 per cent of the total contract

Estimated (notional) profit × 1/3 × Cash received / Work certified

(b) When work certified is 50 per cent or more

Estimated (notional) profit × 2/3 × Cash received / Work certified

The difference between the estimated and transferred profits represents the *reserve for future contingencies* left in the contract account to be carried forward to the following year(s).

To show the *pari passu* relationships between work certified and the amount of profit to be transferred to the current year's profit and loss account, the estimated profit can be

computed on the basis of following equation. However, this equation should be applied when at least 25 per cent of the work is complete.

Estimated profit × Work certified / Contract price × Cash received / Work certified

Estimated profit × Cash received / Work certified

Estimated Profit

When a contract is nearing completion, the contractor would be in a better position to estimate future profits with a greater degree of accuracy. Since the contract has reached on advanced stage, he would find himself in a position where he can estimate the likely future costs to be incurred to get the contract completed and a margin for contingencies. These costs can be added to the costs already incurred on the contract. The *total cost* so arrived at can be deducted from the contract price to arrive at the profit figure. Even in this case, the profit to be carried to the profit and loss account is generally required to be adjusted both for future contingencies and the cash received:

Estimated total profit × Value of work certified / Contract price × Cash received / Work certified

Estimated profit × Value of work certified / Contract price

When cash position is satisfactory.

Estimated total profit means: [Contract price - Costs already incurred + Estimated future costs

+ Margin for contingencies]

In case of non-availability of information about work certified, profit

= Estimated total profit × Cost of work to date / Estimated total cost

Dr. *Proforma Contract Account* *Cr.*

	(When the Work is in Process)
To materials (direct)	By materials returned to store
To materials (ex-store)	By materials transferred to contract sit
To wages and salaries	(specify number)
To sub-contract payments	By materials sold
To other direct expenses	By abnormal loss
To plant (purchased)	By closing stock of materials
To profit and loss A/c (transfer part	of By closing value of plant
realised profits)	By work-in-progress
To reserve for future contingencies	Certified
	Uncertified
	(When the Work is Completed)

To work-in-progress (opening)	By reserve for future contingencies
Work certified	By materials returned
Work uncertified	By plant returned
To plant	By any other item to be credited
Opening balance	By contractee (with the contract price)
Purchase	
To other items of expenses	
To profit and loss A/c (profit)	

Balance Sheet

Liabilities	*Asscts*
Profit and loss A/c [will include profit on contract)	Work-in-progress
(specify the contract number)]	Work certified
Less loss on contract (specify the contract number)	Work uncertified

Sundry creditors	Less reserve for contigencies
Wages accrued	Less contractee (payment received)
Direct expenses accrued	Materials in hand
Any other expenses(specify)	Materials at site
Contract A/c	
To balance c/d	By bank (amount received)
	By balance b/d

Escalation Clause

If the escalation clause is stipulated in the contract, the contractee will compensate the contractor for rise in prices of material and labour beyond a certain percentage. In such cases an upward adjustment of rates will be made.

Cost Plus Contracts

The system of cost-plus contracts was introduced in the foreign countries just after the First World War. In order to avoid delays in estimating, Western governments had entered into contracts on the basis of reimbursing the actual cost plus a certain percentage to cover Admn. overheads and profits. Under this system, the contractee does not settle with the contractor any fixed amount for the contract work. It will be the actual cost plus a certain percentage to cover Admn. overheads and profit. The items included are direct costs as well as costs of supervision, fixed expenses and allowances for waste, scrap, normal losses etc.

5.7 Process, Joint and By-Product Costing

Process costing is "that form of operation costing which applies where standardised goods are produced." (ICMA Definition).

Process Costing

The process costing system refers to the procedure of determining the average unit cost in situations in which the product passes through more than one stage of the manufacturing process. Process costing is appropriate for industries such as chemicals, food processing, petroleum refining, glass, metal manufacturing, steel making, paper, and so on.

In process costing, units of output produced receive identical attention from each production department or operation. The process cost system identifies costs with units of work performed during a period of time. In process costing, unit costs are determined periodically. In process costing, production is for building up inventories for future sales and, therefore, production precedes sales. In process costing, the materials needed for output are known and, hence, the materials inventory kept on hand tends to be higher *vis-à-vis* job costing. In process costing, automation/mechanisation is feasible to a greater extent entailing higher overhead costs, but in job costing production runs are relatively short since the number of units produced each time depends on specific orders received. In marked contrast, in process costing, production being on a mass scale, production runs are long and often continuous. Cost-of-

production reports for each production process, department or operation constitute the focal points of the process costing system.

Cost Accumulation in Process Costing

The process cost system accumulates production costs according to departments or processes. Process costing assumes a sequential flow of costs from one process to another as units of output pass through a number of specified production processes. That is, the units leave the first process and take their costs with them to the second process, the units leave the second process and take their costs with them to the third process, and this process continues till the last process, when output is finally completed. Each process performs part of the total operation and transfers its 'finished' output to the next process, in which it is the input/raw material for further processing. The finished product of the last process is transferred to the finished goods inventory. Thus, the cost becomes cumulative as production moves along, the final process determining the total cost. In process costing, a work-in-process account (process account) is set up for each production process, and the material, labour and indirect manufacturing overhead costs are recorded as the work progresses. Direct materials and direct labour costs are assigned to the respective process accounts using materials requisition forms and payroll records. Likewise, indirect manufacturing overhead costs are often allocated to the units of each process on the basis of a predetermined departmental overhead application rate.

Incomplete Units

Given the nature of the production process, some units may remain incomplete at the time of accounting for the total cost of production. In such a situation, some units are complete while others are incomplete/ partially complete. For the purpose of cost accumulation, the units of production are to be converted into comparable units. They are referred to as *equivalent units*. Symbolically:

Equivalent units = Actual number of partially completed units × Stage of completion

Process Accounts/Production Cost Report

Under the process costing system, the cost of production can be shown in form of production cost reports and/or process cost accounts.

Production Cost Report:

The purpose of a production report is to summarize all of the activity that takes place in a department's work in process account for a period. A production report consists of three parts:

- A quantity schedule and a computation of equivalent units.
- A computation of costs per equivalent unit.
- A reconciliation of all cost flows into and out of the department during the period.

It provides the summary of the production activity and costs of each process or department. On the basis of information regarding production activity in the report, it is possible to determine the number of equivalent units processed, unit costs per equivalent unit, and the quantity and cost of ending work-in-process inventories and of

units completed and transferred to subsequent processing departments/finished goods inventory account.

The total cost of production of each process is split into:

(i) Cost of output *and*

(ii) Closing inventory.

The distribution between these two elements would depend on the method of valuation of work-in-process (closing inventory), namely, weighted average method and first-in-first-out (FIFO) method.

Weighted Average Cost Method

Emphasize that the weighted-average method does not attempt to separate units in the beginning inventory from units started during the current period. Costs and units from beginning inventory are blended together with costs and units from the current period.

Under this method, total costs in process are divided by *equivalent* units produced by the process to ascertain the cost per equivalent unit. Total cost in process is the sum of the current production costs and the costs of opening work-in-process. Total equivalent units produced by the process are determined by adding units completed during the current period and equivalent units of work performed on opening and closing inventories.

FIFO Method

Unlike the weighted average cost method, this method is based on the assumption that units in process at the beginning of the period are the first to be completed and accordingly the first costs incurred in the current period should be attached to the units of the opening work-in-process inventory. Therefore, under this method, the cost of the units that are completed from the opening inventory is separated from the cost of the units that have been introduced and completed during the current period. As a result, under the FIFO method, closing work-in-process inventory is based on the cost pertaining to the current period only *vis-à-vis* average cost under the weighted average cost method.

Thus, The FIFO method separates the costs and equivalent units in beginning inventory from the costs incurred and work done during the current period. (The weighted-average method combines them.)

FIFO assumes the beginning inventory is completed before any new units are started.

Spoilage

In the case of firms whose output passes through several stages, some, wastage/spoilage of units takes place for a variety of reasons, such as breakdown of machines, use of substandard material, poor workmanship, evaporation, shrinkage, and so on. The effect of wastage is that the actual units produced are less than the units introduced initially.

Thus, Spoilage refers to unacceptable units of production that are discarded or are sold for net disposal proceeds.

The treatment of spoiled units depends on the nature of the spoilage/wastage/loss. The wastage may be normal or abnormal. *Normal loss* may be defined as the loss of units which is an inherent part of the production process caused by natural or unavoidable causes such as milling, drying, breaking, weighing,

evaporating, processing, loading, unloading, and so on. Any loss in excess of the normal spoilage is called *abnormal loss.* It is a controllable loss. It involves consumption of resources without accruing corresponding benefits to the firm.

- *Normal spoilage* is spoilage that arises under efficient operating conditions.
    - Costs of normal spoilage are usually viewed as a part of the costs of *good units* manufactured.
    - Normal spoilage rates should be computed using the total good units completed as the base.
- *Abnormal spoilage* is spoilage that is not expected to arise under efficient operating conditions.
    - Abnormal spoilage is regarded as avoidable and controllable.
    - Abnormal spoilage costs are written off as losses.

It is likely that the wasted units (normal as well as abnormal) may have salvage value. The sale proceeds of the units in normal waste would reduce the cost of production. The loss on abnormal wastage charged against the costing profit and loss account will be lower to the extent of the revenue received from their sale.

The unit cost with normal spoilage and with salvage value is computed as per following equation no. 1 and the amount of loss on account of abnormal spoilage to be transferred to profit and loss account is determined as in equation no 2.

1. Cost per unit = (Total process cost-Salvage value of normal spoilage) ÷
   (Total units introduced-Normal loss in units)
2. Abnormal loss = [Abnormal loss in units × Unit production cost] ÷
   Salvage value of abnormal spoilage

Inter-Process Profits

The transfer of the output of one process to another can either be at the cost or at the market/inflated price. The cost basis of inter-process transfer of output has a serious limitation in that the efficiency or inefficiency of one process is passed on to the next. The market price basis overcomes this weakness.

The efficiency of process operations can be judged by comparing the value of output of a process with the price which would be paid for purchasing material from the market. *Market/inflated price transfer formula* has an additional advantage in that the final process account is not artificially distorted by inclusion of a figure of profit which has, in fact, accrued throughout the sequence of prior processes. Each process is, thus, made to stand by itself. Therefore, the *'economy cost'* of performing such operations should be determined. For these reasons, inter-process transfer should be at the current market value or by the addition of an arbitrary percentage to cost. Such transfers would involve inter-process profits.

One important consequence of inflated transfer price (for inter-processes output) would be on valuation of closing stock. The inter-processes profit should be deducted from the closing inventory to show the inventory at cost price.

Joint Products

Two or more products produced simultaneously from a common set of inputs through a single manufacturing process (joint process), are called joint products.

The costs of two or more products of relatively significant sales value that are simultaneously produced by a process or series or processes. The products are not individually identifiable until after a stage of production known as the *splitoff point.* No one of the products may be produced without also producing the other, although the proportions in which they are produced may be variable. Since joint products are the result of the use of some common items of cost, these items of cost are known as common/joint costs. The joint/multiple products resulting from common costs can be either sold at this stage of production or they can be processed further. Therefore, this stage of the joint production process is known as the *split-off point. Split-off point* is that stage in the manufacturing process where the joint products are separately identifiable. Prior to the point of split-off/ separation, products are not subject to identification nor are the costs. Therefore, production costs incurred prior to the split-off point are called *joint costs,* and those incurred after the split-off point are called *separable costs.*

The steps for Effective Determination of Joint Costs

- Define Joint Products
- Define By-Products
- Determine the Split-Off Point
- Identify Separable Costs
- Determine the Cost Impact of Joint Products
- Calculate the Proper Allocation of Joint Product Costs
- Analyze the Cost Impact of Scrap and Waste
- Determine the Cost Impact of Rework

Allocation of Joint Costs

The allocation of joint cost serve no useful control or decision-making purpose but is usually regarded a necessary for stock valuation and income measurement. The critical problem in accounting for joint products is that of allocating common process costs among the separate/multiple outputs that emerge from the joint process. The allocation method used will determine the amount of common processing cost allocated to each of the joint outputs. The commonly-used methods for allocating joint processing costs include:

1. Physical quantities method/Unit method.
2. Relative sales value method/Net realisable value method.
3. Net realisable value less normal profit method.
4. Weighted averages cost method.

Physical Quantities Method/Unit Method Under this method, the total costs

(material, labour and overhead) incurred in the joint production process are allocated to various products in proportion to the physical measurement of the output. The physical measure might be volume, weight, surface area or any other common measure of the physical characteristics. Thus, under this method, the common attribute is aggregated and the joint costs are allocated on the basis of each product's relative share of it.

Relative Sales Value/Net Realisable Value (NRV) Method As per this method, joint costs are *prorated* among multiple products on the basis of the market value of the products manufactured. This method is based on the premise that if a product has a higher sale price, it costs more to produce and, hence, the market value basis to allocate join costs.

If the joint products can be sold at the split-off point, sales price measure can *directly and conveniently* be applied for joint costs allocation. In case the products are not readily marketable at the split-off point, but require further processing, it is necessary to estimate the sales value at the split-off-point. This is usually estimated by taking the sale value after further processing and deducting the additional processing costs. Net realisable value = Sales value after further process - Further processing cost.

Joint Cost Allocation Using Sales Value Method

Product	*Output (kgs)*	*Market price*	*Market value*	*Rates*	*Allocated joint cost*	*Cost per unit*
X	400	Rs 33	Rs 13,200	132/473	Rs 6,140	Rs 15.35
Y	250	44	11,000	110/473	5,116	20.46
Z	350	66	23,100	231/473	10,744	30.70
	1,000		47,300		22,000	22.00

Thus, the costs per unit are in proportion to the sale prices. The relative sale price method generates the same margin percentage (53.48 per cent) for all products. Thus, this approach implies a matching of input costs with revenues generated by each output.

Net Realisable Value Less Normal Profit Method This method is based on the fundamental axiom that profits are earned on total cost incurred, and not on joint costs only. The following are the steps required to apply this method:

(i) Determine the ratio of the total production cost (joint and separable) to total final market value. This ratio is an average cost ratio per rupee of sales.

(ii) Subtract the average cost ratio form 100 per cent to find an average/normal profit ratio,

(iii) Finally, subtract the sum of the separable costs and normal profit from the market value. The amount so arrived at would be allocated joint costs corresponding to each product.

Joint Cost Allocation Using NRV Less Normal Profit Method

Product	*Output (kgs)*	*Market value*	*Normal profit*	*Separable costs*	*Joint cost allocation*	*Joint cost per unit*
X	400	Rs 13,200	Rs 2,177	Rs 6,000	Rs 5,023	Rs 12,557
Y	250	11,000	1,814	4,500	4,686	22,744
Z	350	23,100	3,809	7,000	12,291	35,117
	1,000	47,300	7,800	17,500	22,000	

Working Notes

Normal profit ratio =100 per cent - [Total costs - (Joint + Separable) × 100] ÷ Total market value = 100 per cent - [(Rs 22,000 + Rs 17,500) × 100 ÷ Rs 47,300, 83.5 per cent = 16.5 per cent

It may be noted that gross profit margin is uniform (16.5 per cent) for all the products as per this method which may not be a desirable characteristic. Therefore, this method should again not be taken as a perfect measure of allocating joint costs but, certainly, it is one, which is logically superior to others discussed so far.

Weighted Average Method Where the products are heterogeneous, the weighted average method can provide a reasonable basis for allocating joint costs. This method is theoretically superior to the physical quantity method as this method, by assigning different weights to different products, recognises some significant characteristics of the output.

According to this method, the volume of output for each product is multiplied by a weight that reflects the collective differences among the products. In order to have reliable results from the method, weights should be assigned after giving due and careful consideration to all the relevant characteristics of the product.

By-Products

A by-product is incidental to the process of manufacturing the main/joint products. It is an output whose value does not contribute materially to the revenues of the firm. Its amount, relative to the value of the main product, is small. By-products differ from scrap. For instance, scrap is sold as it is while by-products may have to undergo additional processing before sale. Moreover, it may so happen that the disposal of scrap may involve some expenses instead of yielding any revenue, whereas a by-product always generates some revenue.

The accounting treatment of by-products will depend on whether the by-product is sold at the split-off point or processed further. The former is discussed here while the latter is covered in the next section. The two most commonly used methods of accounting for by-products are: (1) Miscellaneous income method, and (2) Net realisable value method (NRV).

Miscellaneous Income Method

Under this method, sales revenue contributed by the by-products is considered as miscellaneous income of the firm. All costs are assigned to only the main products and not to the by-products. This method is considered as the most appropriate when the value of the by-product is uncertain or so trivial that it is not likely to have any significant/noticeable effect on inventory or profit.

Net Realisable Value Method

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale. In case the value of a by-product is large enough to have a significant effect on inventory or profits, the by product should be valued at its net realisable value/sale value. This treatment would cause *reduction in the cost of production of the main products.* The cost of the joint process is assigned to the joint products as well as to by-products. Therefore, the cost of production of the main output would be lower by the proportionate charge to the by-product.

Sell now (at Split-Off Point) or Process Further

As mentioned in the preceding section, a joint product can be sold at the split-off point or processed further and sold later as a completed production unit. This section explains the accounting for the sale or further processing of the main products as well as the by-products. This exercise will be helpful to the management in arriving at a decision, whether the product should be sold at the split-off point or processed further. From the point of view of managerial decision-making, incremental costs of further processing should be compared with the incremental revenue. This aspect is comprehensively elaborated in a subsequent chapter dealing with short-term decisions.

By products Processed Further

There are several methods of accounting for costs of further processing: (i) Recognition of no profit on sale of by-products; (ii) Recognition of normal profit on by-products; and (iii) Separate cost records for byproducts.

Recognition of No Profit on Sale of By-products Method Under this method, share of joint costs allocated to by-products would be determined by subtracting both selling and further processing costs from the sale price of by-products. Sale price of by-products - Further processing cost beyond split-off point - Selling cost = Joint costs

Recognition of Normal Profit on Sale of By-Products/Reversal Cost Method The share of joint costs assigned to by-products is given by by following equation.

Sale-price-Further processing cost beyond shift off point-Selling cost-Estimated normal profit.

This method is also known as the reversal cost/replacement/opportunity cost method and is most appropriate when by-products are used/utilised in the firm itself as material for manufacturing/processing some other products. Under this method, by-products are valued at the price which would have been paid by the firm in making outside purchases for these products.

Separate Cost Record for By-products This method is most appropriate in situations when the joint manufacturing process yields by-products which are relatively of high value and/or of large quantity; they also require further processing after separation from the joint manufacturing process. In such situations, the by-products cease to be by products; they become as significant as the main products. Accordingly, they must normally be treated as main products and the cost allocated on some equitable and rational basis.

5.8 Practical Exercise:

1. Jagat Ltd employs job-order costing. It uses an annual predetermined rate for

applying manufacturing overheads to jobs. The company furnishes you with the following information regarding its overheads for the coming year at normal activity: Fixed overheads, Rs 4,00,000; and Variable overheads, Rs 3,00,000. The estimates of the direct labour cost, direct labour hours and machine-hours at normal activity along with a set of correlation coefficients between overheads and various measures of activity, as compiled from past records, are also given:

	Normal level of activity	*Correlation coefficient with overheads*
Direct labour cost	Rs 10,00,000	0.7
Direct labour hours	2,00,000	0.8
Machine hours	1 ,00,000	0.6

Determine the predetermined (i) fixed, (ii) variable, and (iii) total overhead rates.

Solution

Predetermined overhead rates should be based on direct labour-hours (DLH):

(i) Predetermined fixed overhead rate = Rs 4,00,000 + 2,00,000 = Rs 2 (ii) Predetermined variable overhead rate = Rs 3,00,000 ÷ 2,00,000 = Rs 1.50 (iii) Total predetermined overhead rate = Rs 7,00,000 4- 2,00,000 = Rs 3.50

2. Further assume that Jagat Ltd during the first quarter received an invitation from a regular customer to bid on a job. The job was estimated to require Rs 1,00,000 of direct materials and the following: Direct labour cost, Rs 50,000; Direct labour-hours, 15,000; and Machine-hours, 5,000

Determine the bid price the company should quote assuming its normal practice of charging 20 per cent on factory cost to cover other administrative overheads and profit. Assume further that the company uses a predetermined factory overhead rate to assign factory overheads to jobs.

Solution

Job Cost Sheet to Determine the Bid Price

Particulars	*Amount*
Direct materials	Rs 1,00,000
Direct labour cost	50,000
Prime cost	1 ,50,000
Add factory overheads (15,000 direct labour-hours @ Rs 3.5 per hour)	52,500
Factory cost	2,02,500
Add *20* per cent for administrative overheads and profit	40,500
Bid price	2,43,000

Suppose in above illustration, the company's actual overheads were Rs 1,80,000 and total direct labour-hoars used were 45,000 in the first quarter. The applied overheads would amount to Rs 1,57,500 [45,000 DLH × Rs 3.50 (Total predetermined

overhead rate per hour)]; overhead is under-applied by Rs 22,500 (Rs 1,80,000-Rs 1,57,500).

3. Work out, in cost sheet form, the unit cost of production per tonne of special paper, manufactured by a Rapar mills in May of the current year from the following data:

Direct materials:

Paper pulp—500 tonnes @ Rs 500 per tonne

Other materials—100 tonnes @ Rs 300 per tonne

Direct labour:

80 skilled men @ Rs 30 per day for 25 days

40 unskilled men @ Rs 20 per day for 25 days

Direct expenses:

Special equipment—Rs 30,000

Special dyes—Rs 10,000

Works/factory overheads:

Variable @ 100 per cent and fixed @ 60 per cent on direct wages

Administrative overhead @ 10 per cent of factory cost

Selling and distribution overhead @ 15 per cent on work cost

400 tonnes of special paper was manufactured and sold @ Rs 2,000 per tonne and Rs 8,000 was realised by the sale of waste material during the course of manufacture. The scrap value of the special equipment and dyes after utilisation in manufacture is nil.

Prepare the production account also.

Solution

Cost Sheet for the Period Ending May, Current Year

Particulars	Total cost (400 tonnes)	Cost per tonne
Direct materials used:		
Paper pulp	Rs 2,50,000	Rs 625
Other materials	30,000	75
Direct labour cost:		
Skilled men (80 men × Rs 30 × 25 days)	60,000	150
Unskilled men (40 men × Rs 20 × 25 days)	20,000	50
Other direct expenses:		
Special equipment	30,000	75
Special dyes	10,000	25
Prime cost	4,00,000	1,000
Add factory overheads:		
Variable (100 per cent on direct wages)	80,000	200
Fixed (Rs 80,000 × 0.60)	48,000	120
Less sale proceeds of waste material	(8,000)	20
Factory/Works cost	5,20,000	1,300
Add administrative overheads:		
10 per cent of factory cost	52,000	130
Cost of production	5,72,000	1,430
Add selling and distribution overheads: (Rs 5,20,000 × 0.15)	78,000	195
Cost of sales	6,50,000	1,625
Profit	1,50,000	375
Sales	8,00,000	2,000

Note Sale proceeds of waste materials have been deducted at the stage of factory overheads since -materials have undergone manufacturing process.

Production Account for the Period Ending May Current Year

Particulars	Dr Amount	Particulars	Cr Amount
To direct materials:		By prime cost c/d	Rs 4,00,000
Paper pulp			
(500 tonnes × Rs 500)	Rs 2,50,000		
Other materials			
(100 tonnes × Rs 300)	30,000		
To direct labour:			
Skilled men (80 × Rs 30 × 25)	60,000		
Unskilled men	20,000		
(40 × Rs 20 × 25)			
To other direct expenses:			
Special equipment	30,000		
Special dyes	10,000		
	4,00,000		4,00,000
To prime cost b/d	4,00,000	By sale proceeds of waste material	8,000
To factory overheads:			
Variable	80,000	By factory cost c/d	5,20,000
Fixed	48,000		
	5,28,000		5,28,000
To factory cost b/d	5,20,000	By cost of production c/d	5,72,000
To administrative overheads	52,000		
	5,72,000		5,72,000
To cost of production b/d	5,72,000	By cost of sales c/d	6,50,000
To selling and distribution overheads	78,000		
	6,50,000		6,50,000
To cost of sales b/d	6,50,000	By sales	8,00,000
To profit	1,50,000		
	8,00,000		8,00,000

4. Jasmine Ltd. uses a job-order cost system. The following is a summary of its operations during January:

1. Purchases of raw materials and supplies, Rs 37,500.

2. Materials and supplies were requisitioned and issued as follows: Direct materials:

Job No.	101	Rs 6,000	
	102	9,000	
	103	1,400	Rs 16,400
Indirect materials			4000

3. Factory payroll sent to the general office for payment was distributed as follows: Direct labour:

	Job No. 101	Rs 5,400
	102	6,000
	103	600
		Rs 12,000
Indirect labour		4,000

4. Indirect miscellaneous manufacturing costs incurred, Rs 5,200.

5. Indirect manufacturing costs were applied using a rate of 70 per cent of direct labour cost.

6. Job No. 101 (100 units) and Job No. 102 (50 units) were completed and transferred to finished goods.

7. Goods despatched to customers were as follows: From Job No. 101, 50 units; From Job No. 102, 100 units.

Prepare the required ledger accounts to record the above transactions in the factory ledger.

Solution

Job Ledger

	Job No. 101	*Job No. 102*	*Job No. 103*
Raw materials and supplies	Rs 6,000	Rs 9,000	Rs 1,400
Direct labour	5,400	6,000	600
Indirect manufacturing costs applied	3,780	4,200	420
	15,180	19,200	2,420

Factory Ledger Accounts

Raw Materials and Supplies A/c

To general ledger (purchase of inventory)	Rs 37,500	By work-in-process	Rs 16,400
		By factory overhead control A/c	400

Work-in-Process A/c

To raw materials and supplies	Rs 16,400	By finished goods (cost of Job Nos. 101 and 102	Rs 34,380
To general ledger (direct labour payment)	12,000		
To factory overhead control (applied A/c)	8,400		

Finished Goods Inventory A/c

To work-in-process	Rs 34,380	By cost of goods sold (Rs 7,590 + Rs 12,800)	Rs 20,390

Cost of Goods Sold A/c

To finished goods inventory	Rs 20,390

Factory Overhead Control A/c

To raw materials and supplies	Rs 400
To general ledger (indirect labour payment)	4,000
To general ledger (miscellaneous expenses)	5,200

Factory Overhead Control Applied A/c

By work-in-process **Rs 8,400**

General Ledger Accounts

By raw materials and supplies	Rs 37,500
By work-in-process	12,000
By factory overhead control A/c	4,000
By factory overhead control A/c	5,200

Note Ledger accounts are not balanced as the transactions pertain to only a month's period.

General Ledger Accounts

Factory Ledger (A/c)

To accounts payable	Rs 37,500
To wages payable 16,000 To miscellaneous credits	5,200

Accounts Payable A/c

By factory ledger A/c	Rs 37,500

Wages Payable A/c

By factory ledger A/c	Rs 16,000

Miscellaneous Credits A/c

By factory ledger A/c	Rs 5,200

Debits in these accounts would be made when payments are made.

The above cost recording procedure is valid when a *separate* factory ledger is maintained. We now enumerate the accounting system when the general ledger records *all* transactions and no separate factory ledger is maintained.

5. The following extracts of costing information related to commodity P for the half year ending September 30 of the current year:

Purchases of raw materials	Rs 1,32,000
Direct wages	1,10,000
Rent, rates, insurance and works overhead	44,000
Carriage inwards 1,584 Stock, April 1 of the current year:	
Raw materials 22,000	
Finished products (1,600 tonnes)	17,600
Stock, September 30 of the current year:	
Raw materials	24,464
Finished products (3,200 tonnes)	35,200
Work-in-process, April 1	5,280
Work-in-process, September 30	17,600
Cost of factory supervision	8,800
Sales of finished product	3,30,000

Advertising, discounts allowed and selling costs amounted to Rs 0.75 per tonne sold and 25,600 tonnes of commodity were produced during the period.

You are required to ascertain (a) the value of raw materials used; (b) prime cost; (c) the cost of turnover of the period; (d) net profit for the period; and (e) net profit per tonne of the commodity sold.

Solution

Production Statement/Cost Sheet for the Half-Year Ending September 30

Particulars	Total cost		Cost per tonne
Direct materials consumed:			
Opening stock	Rs 22,000		
Add purchases	1,32,000		
Add carriage on purchases	1,584		
Less closing stock	(24,464)	Rs 1,31,120	
Direct wages		1,10,000	
Prime cost (25,600 tonnes)		2,41,120	Rs 9.41875
Add factory overheads:			
Rent, rates, insurance and works overheads	44,000		
Cost of factory supervision	8,800	52,800	
Gross works cost		2,93,920	
Add opening work-in-process inventory		5,280	
Less closing work-in-process inventory		(17,600)	1.58125[@]
Net works cost (cost of production)		2,81,600	11.00
Add opening finished goods inventory (1,600 tonnes)		17,600	
Less closing finished goods inventory (3,200 tonnes)		(35,200)	—
Cost of goods sold (24,000 tonnes) (25,600 + 1,600 - 3,200)		2,64,000	11.00
Add selling and distribution overheads		18,000	0.75
Cost of sales		2,82,000	11.75
Add profit (balancing figure)		48,000	2.00
Sales revenue (24,000 tonnes)		3,30,000	13.75

[@]Factory overheads per tonne of output is Rs 1.58125, that is, cost of goods sold, Rs 11—prime cost, Rs 9.41875.

Note The firm is assumed using the average costing method of valuing work-in-process.

6. The following transactions occurred at the Sujata Ltd:

1. Issued Rs 1,000 in supplies from the materials inventory.

2. Purchased materials worth Rs 20,000.

3. Purchased materials costing Rs 15,800 on cash basis.

4. Paid for the materials purchased.

5. Issued materials worth Rs 17,000 to the production department.

6. Incurred wages of Rs 42,000 which were debited to a temporary account called the wages payable account. Of this amount, Rs 8,000 was withheld for taxes; the balance was paid in cash to the employees.

7. Analysis of the wage accounts reveals that 60 per cent was direct labour, 30 per cent indirect manufacturing labour and 10 per cent administrative and selling costs.

8. Paid cash for utilities, power, equipment maintenance, and other miscellaneous items for the manufacturing plant. The total amount was Rs 21,600.

9. Applied overhead on the basis of 175 per cent of direct labour costs.

10. Depreciation on plant and equipment is to be charged at Rs 10,500.

11. The to ›wing balances appeared in the accounts of company:

	Opening	*Closing*
Materials inventory	Rs 37,050	—
Work-in-process inventory	8,250	—
Finished goods inventory	41 ,500	Rs 33,200
Cost of goods sold		65,850

You are required to prepare T accounts to show the costs during the period.
SOLUTION

Ledger Accounts

Materials Inventory A/c

To balance b/d	Rs 37,050	By factory overhead control A/c	Rs 1,000
To accounts payable	20,000	By work-in-process inventory	17,000
To cash (purchases)	15,800	By balance c/d	54,850
	72,850		72,850
To balance b/d	54,850		

Work-in-Process Inventory A/c

To balance b/d	Rs 8,250	By finished goods inventory A/c	Rs 57,550
To raw materials inventory	17,000	By balance c/d	37,000
To factory overhead control A/c	44,100		
To wages control A/c (Rs 42,000 × 0.60)	25,200		
	94,550		94,550
To balance b/d	37,000		

Finished Goods Inventory A/c

To balance b/d	Rs 41 ,500	By cost of goods sold	Rs 65,850
To work-in-process inventory (balancing figure)	57,550	By balance c/d	33,200
To balance b/d	33,200		
	99,050		90,050

Factory Overhead Control A/c

To raw materials inventory	Rs 1,000	By work-in-process A/c	Rs 44,100
To wages control A/c	12,600	(Rs 25,200 × 1 .75)	
(Rs 42,000 × 0.30)		By factory-overhead control 3 1,600 applied A/c	
To cash (for various overheads)	21,600	(under-absorbed)	
To accumulated depreciation to pant	10,500		
	45,700		45,700

7. In Gemini Ltd. A product passes through two processes, A and B. During the month ended June 30, 1,500 units were produced. The detailed cost break-up is as follows:

	Process A	*Process B*
Direct materials	Rs 90,000	Rs 75,000
Direct labour	75,000	1,50,000
Direct expenses	15,000	18,000

Indirect overhead costs during the period were Rs 60,000 apportioned to the processes on the basis of direct labour cost. No work-in-progress existed at the beginning and end of the period. Prepare relevant process accounts.

Solution

Process A Account

To direct materials	Rs 90,000	By cost of output transferred	
To direct labour	75,000	to process B	Rs 2,00,000
To direct expenses	15,000		
To indirect overheads (Rs 60,000 × 1/3)	20,000		
	2,00,000		2,00,000

Process B Account

To process A (cost transferred)	Rs 2,00,000	By cost of output transferred	
To direct material	75,000	to finished goods inventory	Rs 4,83,000
To direct labour	1,50,000		
To direct expenses	18,000		
To indirect overheads (Rs 60,000 × 2/3	40,000		
	4,83,000		4,83,000

Finished Goods Inventory

To process B (cost of output)	4,83,000

8. From the following cost records of Manilal Paints Ltd., you are required to prepare production account with maximum possible break-up of costs and profits for the quarter ending March 31 of the current year:

Opening raw materials inventory	Rs 1,50,000
Closing raw materials inventory	1 ,80,000
Direct wages	1,00,000
Indirect wages	10,000
Opening work-in-process inventory	55,000
Closing work-in-process inventory	70,000
Sales	4,00,000
Purchase of raw materials	1,30,000
Carriage on purchases of materials	5,000
Factory rent, rates and power	30,000
Depreciation of plant and machinery	7,000
Repairs of machinery	3,000
Advertising	12,000

Office rent and taxes	5,000
Salesmen salaries and commission	15,000
Opening stock of finished goods inventory	1,00,000
Closing stock of finished goods inventory	65,000
Sale of scrap	2,000

9. Power Ltd. furnishes the following information for 10,000 TV valves manufactured during the previous year:

Material	Rs 90,000
Direct wages	60,000
Power and consumable stores	12,000
Factory indirect wages	15,000
Lighting of factory	5,500
Defective work (cost of rectification)	3,000
Clerical salaries and management expenses	33,500
Selling expenses	5,500
Sale proceeds of scrap	2,000
Plant repairs, maintenance and depreciation	11,500

Last year, the net selling price was Rs 31.60 per unit and all the units were sold. As from April 1 of the current year, the selling price was reduced to Rs 31 per unit. It was estimated that production could be increased in the current year by 50 per cent due to spare capacity. Rates for materials and direct wages would increase by 10 per cent.

You are required to prepare a statement of cost and profit for the current year, assuming that 15,000 units will be produced and sold during the year and that factory overheads will be recovered as a percentage of direct wages, and office and selling expenses as a percentage of the works cost.

Solution

Project Statement of Cost and Profit for the Current Year (Output 15,000' Units)

Particulars	Total cost	Cost per unit
Material cost @ Rs 9.90 per unit	Rs 1,48,500	Rs 9.90
Direct wages @ Rs 6.60 per unit	99,000	6.60
Prime cost	2,47,500	16.50
Add factory overheads (0.75 × direct wages)*	74,250	4.95
Work cost	3,21,750	21.45
Add office and selling overheads (0.20 × works cost)	64,350	4.29
Cost of sales	3,86,100	25.74
Estimated profit (balancing figure sales price-cost of sales)	78,900	5.26
Sales revenue	4,65,000	31.00

Working Notes

Determination of Factory Overheads:	
Factory overheads (previous year):	
Power and consumable stores	Rs 12,000
Factory indirect wages	15,000
Lighting of factory	5,500
Cost of rectification of defective work (assumed to be normal)	3,000
Plant repairs, maintenance and depreciations	11,500
Less sale of scrap	2,000
Total	45,000
Direct wages	60,000
Factory overheads as per cent of direct wages	75

Determination of Office and Selling Overheads:	
Works cost (previous year):	
Material cost	Rs 90,000
Direct wages	60,000
Factory overheads as above	45,000
	1,95,000
Selling and office overheads (Rs 33,500 + Rs 5,500)	39,000
Office and selling overheads as per cent of works cost	20

10. A shop-floor supervisor of Raj Ltd. presents the following per unit cost for Job No. 420 to determine the selling price:

Materials	Rs 70
Direct wages (18 hours @ Rs 2.50) (Department X, 8 hours; Department Y, 6 hours; Department Z, 4 hours)	45
Chargeable expenses (special stores items)	5
	120
Add 33.33 per cent for expenses	40
Total	160

Analysis of the profit and loss A/c for the current year shows the following:

Materials used		Rs 1,50,000	Sales less returns	Rs 2,50,000
Direct wages:				
Department X	Rs 10,000			
Department Y	12,000			
Department Z	8,000	30,000		
Special stores items		4,000		
Overheads:				
Department X	5,000			
Department Y	9,000			
Department Z	2,000	16,000		
Gross profit c/d		50,000		
		2,50,000		2,50,000
Selling expenses		20,000	Gross profits b/d	50,000
Net profit		30,000		
		50,000		50,000

It is also noted that average hourly wage rates for the 3 departments, X, Y, and Z are similar. Direct labour-hour method is followed to absorb overheads.

You are required to: (i) Draw up a job cost sheet; (ii) Calculate revised cost for the current year, using actual figures as basis; and (iii) Add 20 per cent to total costs to determine selling price.

Solution

Job Cost Sheet

Customer name	Job No. 421
Description and quantity	Date started
Special remarks	Date promised
	Date finished

Particulars	*Rate*	*Hours/quantity*	*Amount*
Materials used			Rs 70.00
Direct wages:			
Department X	Rs 2.50	8	20.00
Department Y	2.50	6	15.00
Department Z	2.50	4	10.00
Direct expenses			5.00
Prime cost			120.00
Indirect overheads: (see working note)			
Department X	1.25	8	10.00
Department Y	1 .875	6	11.25
Department Z	0.625	4	2.50
Cost of production (total cost)			143.75
Add 20 per cent profit margin on cost			28.75
Selling price			172.50

Working Note.

Determination of Overhead Rate

Department	*Overheads*	*Direct labour-hours (Total wages + hourly rates)*	*Rate per hour*
X	Rs 5,000	4,000	Rs 1.25
Y	9,000	4,800	1.875
Z	2,000	3,200	0.625

11. The normal expenses attributable to machine No. I and the normal hours for which the machine is expected to be utilized in the current year are indicated below for Swati Ltd.:

Fixed		Rs 2,000
Variable:		
Power	Rs 1,500	
Repairs	900	
Lubricants	600	3,000
		5,000

Predetermined normal hours of working:	
To make ready	200
Running on jobs	800
Total	1,000

From the data furnished below, compute the cost of job No. 8237:

Materials consumed (10 units of Rs 5 per unit)	Rs50
Direct labour cost:	
To make ready: 2 machine-hours at Re 1	2
Running on job: 8 machine-hours at Re 1	8
	60

Solution

Job Cost Sheet

Customer name	Job No. 8237 ....
Description and quantity	Date started .....
Special remarks	Date promised .....
(Machine III is used on job)	Date finished ....

Particulars	*Rate*	*Hours/units*	*Amount*
Materials (Requisition No....)	Rs 5	10	Rs 50
Wages: (To make ready)	1	5	2
(Running on job)	1	8	8
Prime cost			60
Factory overheads:			
To make ready	2	2	4
Running on job (see working note)	5.75	8	46
Cost of production			110

Determination of factory overheads: Total normal machine-hours are 1,000; of which setting-up time (to make ready) is 200 hours. Fixed expenses will be pro-rated on the basis of 1,000 hours and variable expenses on the basis of 800 hours the machine worked. The rates, so determined would be:

Fixed overhead rate to make ready (Rs 2,000, total expenses 1 ,000)	Rs 2.00
Variable (Rs 3,000, total expenses ÷ 800)	3.75
Overhead rate to make ready	2.00
Overhead rate for running time would be the sum of the two rates, (Rs 2 + Rs 3.75)	5.75

12. From the following information of Rajiv Limited, prepare a statement of equivalent units.

Opening inventory: Partially completed units (40 per cent complete) 600

Units introduced during the period 10,000

Closing inventory (partially completed units: 70 per cent complete) 2,000

Solution

Statement of Equivalent Units

1. Work necessary to complete opening inventory (600 × 0.60) 360

2. Work necessary to start and finish units introduced during the current year

(10,000 - 2,000 partially completed units)
8,000

3. Work performed on closing inventory (2,000 × 0.70)
1,400

Total number of equivalent units
9,760

13. From the following data, prepare a production statement of the Kajal stoves Ltd. for the current year ending March 31:

Opening materials inventory	Rs 70,000
Closing materials inventory	9,800
Purchase of materials	1,05,000
Factory wages	1,90,000
Factory expenses	35,000
Establishment expenses	20,000
Opening finished inventory Nil	
Closing finished inventory	70,000
Sales	3,78,000

The number of stoves manufactured during the year was 8,000. The company wants to quote for the supply of 2,000 stoves for the coming year. The stoves to be quoted are similar to those in the current year but cost of materials is expected to increase by 10 per cent and factory labour by 20 per cent.

Prepare a statement showing the price to be quoted so as to give the same percentage of profit on turnover as was realised during the current year assuming that other costs will be the same as in the previous year.

Solution

Statement of Cost of Production and Profit to Quote Prices

Particulars	**Total cost** (2,000 units)	Cost per unit
Materials cost	Rs 45,430 [1]	Rs 22.715
Direct wages	57,000 [2]	28.500
Prime cost	1,02,430	51.215
Add factory expenses @ Rs 4.375(Rs 35,000 ÷ 8,000 units)	8,750	4.375
Factory cost	1,11,180	55.590
Add establishment expenses @ Rs 2.50 (Rs 20,000 ÷ 8,000 units)	5,000	2.500
Cost of production	1,16,180	58.090
Add margin of profit (0.10 × sales or 1/9 of cost price)	12,908	6.454
Quotation price	1,29,088	64.544

Working Notes

Determination of Material Cost:		
Opening inventory		Rs 70,000
Add purchases		1,05,000
Less closing inventory		(9,800)
Cost of material consumed ÷ Number of stoves manufactured		1,65,200
		8,000
Material cost per unit		20.650
Add 10 per cent cost (increase)		2.065
Material cost (current) per unit		22.715
Determination of Labour Cost: (Rs 1,90,000 -f 8,000)		23.75
Add 20 per cent increase		4.75
Current labour cost per unit		28.50
'Determination of Margin of Profit on Sales of Previous Year:		
Sales revenue		Rs 3,78,000
Less cost of production:		
Cost of materials consumed	Rs 1,65,200	
Factory wages	1,90,000	
Factory expenses	35,000	
Establishment expenses	20,000	
	4,10,200	
Less closing inventory of finished product	(70,000)	3,40,200
Profit		37,800
Profit as per cent of sales revenue = (Rs 37,800 ÷ Rs 3,78,000)		
= 10 per cent		

14. From the following particulars make out a weekly cost sheet showing profit on the main product of Ravi Petrolium Ltd:

Crude oil used	5,00,000 litres @	Rs 0.50
Petrol produced (main product)	1,50,000 litres	2.50
By-products:		
(i) Lubricating oil produced	50,000 litres	2.00
(ii) Fuel oil produced	2,50,000 litres	1.00
(iii) Kerosene produced	30,000 litres	0.80
Raw materials consumed		48,000
Wages paid		1,20,000
Repairs and renewals		86,000
Salaries and general charges		50,000

Show the percentage of each product to the weight of crude oil used.

Solution

Cost Sheet For the Week Ending (Units in Litres)

Particulars	Quantity (litres)	Total cost	Cost per unit
Crude oil used (input)	5,00,000	Rs 2,50,000	
Raw materials		48,000	
Wages		1,20,000	
Repairs and renewals		86,000	
Salaries and general charges		50,000	
Total cost of production of main product and by-products (joint cost)		5,54,000	
Less sale proceeds from by-products (output)			
Lubricating oil	(50,000)	(1,00,000)	
Fuel oil	(2,50,000)	(2,50,000)	
Kerosene	(30,000)	(24,000)	
Wastage (assumed to be normal)	(20,000)	Nil	
Cost of production of main product (petroleum)	1,50,000	1,80,000	Rs 1 .20
Profit (balancing figure)		1,95,000	1.30
Sales revenue		3,75,000	2.50

Statement Showing the Percentage of Each Product to be Weight of Crude Used

Input (litres)	Particulars	Output (litres)	Percentage
5,00,000	Crude oil		
	Petrol	1,50,000	30
	Lubricating oil	50,000	10
	Fuel oil	2,50,000	50
	Kerosene	30,000	6
	Wastage Total	20,000	4
5,00,000		5,00,000	100

15. From the following production record of Purab Ltd., prepare a statement of equivalent units:

Units in process-opening		2,000
Stage of completion (%):	material	100
	labour	60
	overheads	50
New units introduced		20,000
Units completed		18,000
Units in process-closing		4,000
Stage of completion (%):	material	100
	labour	50
	overheads	40

Solution

Statement of Equivalent Units

Input	*Particulars*	*Number of units (completed or otherwise)*	*Work performed during the current period [stage of completion (per cent)]*			*Equivalent produced units: input units × stage completion in respect of*		
			Material	*Labour*	*Over-heads*	*Material*	*Labour*	*Over-heads*
Opening inventory 2,000 units + 20,000 units introduced during the current period	Work expended on opening inventories (100 per cent stage of completion) Units started and completed during the current period (18,000 total units completed inventory)	2,000	Nil	40	50	—	800	1,000
		16,000	100	100	100	16,000	16,000	16,000
	Closing inventory (work-in-process)	4,000	100	50	40	4,000	2,000	1,600
22,000		22,000				20,000	18,800	18,600

16. The Rajguru Ltd manufactures special-purpose small machines to order. In the beginning of the year, there were two jobs in process, namely, Job No. 110 and Job No. 111. The following costs were applied to these jobs in the previous year:

	Job 110	*Job 111*
Direct materials	Rs 25,000	Rs 40,000
Direct labour	20,000	15,000
Overheads	22,200	16,650
	67,200	71 ,650

During January of the current year, the following transactions took place:

1. Raw materials costing Rs 2,00,000 were purchased on account.

2. Supplies costing Rs 40,000 were purchased for cash.

3. Jobs 102, 103 and 104 were started and the following costs applied to them:

	Job 102	*Job 103*	*Job 104*
Direct materials	Rs 15,000	Rs 50,000	Rs 35,000
Direct labour	25,000	30,000	20,000

4. Jobs 110 and 111 were completed; additional direct labour costs incurred on them were Rs 10,000 and Rs 20,000 respectively.

5. Wages paid to production employees during January totalled Rs 1,25,000, of which accrued wages of the previous year were Rs 25,000; wages payable at the end of the current month were Rs 20,000.

6. Depreciation for the month totalled Rs 50,000.

7. Utilities bills totalling Rs 60,000 were received for the January operations.

8. Supplies costing Rs 10,000 were used.

9. Miscellaneous overhead expenses totalled Rs 12,000 for January.

Actual overhead is applied for individual jobs at the end of each month using a rate based on actual direct-labour costs. You are required to

(a) Determine the overhead rate for the month of January.

(b) Pass the necessary journal entries for each of the transactions that book place during January.

(c) Specify all subsidiary records affected by each transaction.

(d) Determine the amount of profit earned on Jobs 110 and 111, assuming job prices of Rs 1,10,000 and Rs 1,70,000 respectively.

(e) Prepare a statement of cost of goods manufactured.

Solution

(a) Determination of Overhead Rate (January)

Indirect labour:	
Wages paid	Rs 1,25,000
Less wages outstanding of previous year	(25,000)
Add wages outstanding of current month	20,000

		1 ,20,000	
Less direct labour			
Job 110	Rs 10,000		
111	20,000		
102	25,000		
103	30,000		
104	20,000	(1,05,000)	Rs 15,000
Depreciation			50,000
Utilities			60,000
Supplies			10,000
Miscellaneous overhead			12,000
Total overheads			1 ,47,000
Actual direct labour cost			1 ,05,000
Overhead rate (Rs 1 ,47,00 0 / 1,05,000) × 100 (per cent)			140

(b) and (c) Subsidiary Records Affected by the Fransactions are Shown Along with Journal Entry.

Particulars		*Dr Amount*	*Cr Amount*
Stores control A/c	Dr	Rs 2,00,000	
To accounts payable			Rs 2,00,000
(Inventory ledger cards, payable ledger)			
Supplies inventory A/c	Dr	40,000	
To bank			40,000
(Supplies inventory may have separate records and accordingly subsidiary ledgers would be affected)			
Work-in-process A/c	Dr	1 ,00,000	
To stores control			1,00,000
(Job cost sheets and inventory ledger cards)			
Factory overhead control A/c	Dr	15,000	
(individual labour)			
Work-in-process	Dr	1 ,05,000	
To wages payable			1,20,000

(Overhead ledger cards, job cost sheets and payable ledger)			
Wages payable A/c	Dr	1 ,25,000	
To bank/cash			1 ,25,000
(Payables ledger)			
Factory overhead control A/c	Dr	1 ,32,000	
To accumulated depreciation			50,000
To accounts payable (utilities)			60,000
To supplies inventory			10,000
To sundry accounts			12,000
(overheads ledger *cards payables ledger and fixed assets ledger)*			
Accounts payable (utilities)	Dr	50,000	
To bank/cash			50,000
(Accounts payable ledger)			
Work-in-process A/c	Dr	1 ,47,000	
To factory overhead control			1 ,47,000
(Job cost sheets and overhead ledger cards)			
Finished stock inventory	Dr	2,10,850	
To work-in-process			2,10,850

(d) Job Cost Sheet (for jobs 110 and 111)

Particulars	*Job 100*	*Job 101*
Opening work-in-process		
Direct materials	Rs 25,000	Rs 40,000
Direct labour	20,000	15,000
Overhead	22,200	16,650
	67,200	71,650
Add current month cost		
Direct labour	10,000	20,000
Overhead (140 per cent)	14,000	28,000
Total cost	91 ,200	1,19,650
Profit (balancing figure)	18,800	50,350
Job prices	1,10,000	1 ,70,000

(e) Statement of Cost of Goods Manufactured for the Month of January

Particulars		*Amount*
Direct materials		Rs 1,00,000
Direct labour		1 ,05,000
Prime cost		2,05,000
Add factory overheads		
Indirect labour	Rs 15,000	
Depreciation	50,000	
Utilities	60,000	
Supplies	10,000	
Miscellaneous overheads	12,000	1 ,47,000
Gross *factory cost*		3,52,000
Add work-in-process (opening)		
Job 110	67,200	
Job 111	71,650	1 ,38,850
Less closing work-in-process		
Job 102 (Rs 15,000 + Rs 25,000 + Rs 35,000)	75,000	
Job 103 (Rs 50,000 + Rs 30,000 + Rs 42,000)	1 ,22,000	
Job 104 (Rs 35,000 + Rs 20,000 + Rs 28,000)	83,000	(2,80,000)
Cost of goods manufactured		2.10,850

17. For the firm in example 15 given above, assume following:

Cost of 2,000 units in process (opening):

Materials	Rs 6,000
Labour	3,600
Overheads	2,400

Processing costs during the current period

Materials	69,900
Labour	56,560
Overheads	58,360

Prepare a cost of production report for the current period using (a) weighted average, and (b) FIFO costing methods.

Solution

Cost of Production Report of Process A (Weighted average cost method)

Flow of completed or partially completed units:	
Opening	2,000
Introduced	20,000
Total in process	22,000
Less completed	18,000
In process	4,000

Equivalent units in process:

	Conversion costs		
	Material	*Labour*	*Overhead*
Units completed	18,000	18,000	18,000
Equivalent units in ending inventory	4,000	2,000	1,600
	22,000	20,000	19,600

Total cost to be accounted for:

	Material	*Labour*	*Overheads*	*Total*
Work-in-process (opening)	Rs 6,000	Rs 3,600	Rs 2,400	Rs 12,000
Current costs	69,900	56,560	58,360	1 ,84,820
Total cost in process	75,900	60,160	60,760	1 ,96,820
Equivalent units (EU) in process	22,000	20,000	19,600	—
Cost per equivalent unit in process (Total cost ÷ EU)	3.45	3.008	3.1	9.558

Costs accounted for:

Transferred to finished goods inventory (18,000 × Rs 9.558)			1,72,044
Work-in-process (closing inventory)			
Materials (4,000 × 100 per cent × Rs 3.45)	Rs 13,800		
Labour (4,000 × 0.50 × Rs 3.008)	6,016		
Overheads (4,000 × 0.40 × Rs 3.1)	4,960		24,776
Total costs accounted for			1 ,96,820

Cost of Production Report of Process A (FIFO method)

Flow of completed or partially completed units:	
Opening	2,000
Introduced	20,000

Total in process	22,000
Less completed	18,000
In process	4,000

Equivalent units manufactured:

		Conversion costs	
	Material	*Labour*	*Overheads*
Units completed	18,000	18,000	18,000
Equivalent units in ending inventory	4,000	2,000	1,600
Equivalent units in process	22,000	20,000	19,600
Less equivalent units in opening inventory	2,000	1,200	1,000
Equivalent units manufactured	20,000	18,800	18,600

Total costs to account for:

	Material	*Labour*	*Overheads*	*Total*
Opening work-in-process	—	—	—	Rs 12,000
Current costs	Rs 69,900	Rs 56,560	Rs 58,360	1 ,84,820
Total costs in process				1 ,96,820
Equivalent units manufactured	20,000	18,800	18,600	—
Cost per equivalent unit manufactured	3.495	3.0085	3.1376	9.6411

Costs *accounted for:*

Transferred to finished goods inventory		
First batch:		
Work-in-process opening inventory	Rs 12,000	
Add conversion costs:		
Labour (2,000 × 0.40 × Rs 3.0085)	2,406.8	
Overheads (2,000 × 0.50 × Rs 3.1376)	3,137.6	17,544.4
Second batch:		
Started and completed (16,000 × Rs 9.6411)		1,54,257.6

Work-in-process (closing):		
Materials (4,000 × 100 per cent × Rs 3.495)	13,980	
Labour (4,000 × 0.50 × Rs 3.0085)	6,017	
Overheads (4,000 × 0.40 ×Rs 3.1376)	5,020.16	25,017.16
		1,96,819.16

Comparison For comparison of the two costing methods, summary results of important items are listed below:

	FIFO		*Weighted average cost*
(A) Cost of output transferred from			
(i) Opening inventory Rs	17,544.40		Rs 1,72,044
(ii) Current production	1,54,257.60	Rs 1,71,802	
(B) Closing work-in-process		25,017.16	24,776
		1,96,819.16	1,96,820

18. Tran Ltd is running 4 buses between two towns which are 100 kms apart: the seating capacity of each bus is 50 passengers and 80 per cent of this capacity is actually used. Each vehicle makes 2 round trips daily and the vehicles are working on an average of 25 days a month. Determine the passenger-kms. Also, determine cost per passenger-km, if the total operating costs for 4 buses are Rs 32,00,000.

Solution

Passenger-km = Number of buses × Distance × Capacity × Trips × 2 × Days × Percentage of the capacity used

$= (4 \times 100 \times 50 \times 2 \times 2 \times 25) \times 0.80 = 16,00,000$

Cost per passenger-km =Total costs/ Total passenger-kms = Rs 32,00,000/16,00,000

= Rs 2

When the transport undertaking owns vehicles having different capacities, cost unit should be determined with reference to varying capacities.

19. Suraj transport company operates the following fleet: 20 trucks of 10 tonne capacity, 10 trucks of 5 tonne capacity, 5 mini-trucks of 2 tonne capacity each.

The first two types of trucks are used for long distances and the mini-truck is utilised for local transport only. In a week, the following distances were covered by each of the trucks: 10 tonne capacity truck, 600 kms; 5 tonne capacity truck, 500 kms; 2 tonne capacity truck, 300 kms.

If the total cost is Rs 3,70,000, determine the cost per tonne-km, assuming that all vehicles worked to their full capacity during the period.

Solution

Determination of Total Tonne-Kilometers (kms)

Number of vehicle	**Capacity in tonnes**	Distance in kms	Tonne-kms
20	10	600	1,20,000
10	5	500	25,000
5	2	300	3,000
			1,48,000

Cost per tonne-kilometre = Rs 3,70,000/1,48,000 = Rs 2.50

20. Super Ltd produces gramophone records and has several different recording companies as clients. Since each order is separately identifiable, a job order accounting system is in use. Two departments are utilized, and the following overhead budget data at normal activity are available for the whole current year as well as the actual overhead cost for the first month (April):

	Overhead budget for the current year at normal level of activity	*Actual overheads(April)*
Department X		
Fixed	Rs 7,20,000	Rs 66,000
Variable	6,00,000	63,000
Department Y		
Fixed	10,80,000	87,000
Variable	9,00,000	51 ,000

During January, 2 jobs were in production (219 and 211). The following is a summary of some of the data from their respective job cost sheets.

	Job 219 Departments		*Job 211 Departments*	
	X	Y	X	Y
Direct labour	Rs 1,08,000	Rs 15,000	Rs 36,000	Rs 42,000
Direct labour-hours	24,000	3,000	6,000	9,000
Machine-hours	4,800	24,000	3,000	12,000

The estimates of the departments' direct-labour cost, direct labour-hours, and machine-hours at normal activity are also provided in the following table, along with a set of correlation coefficients between overheads and the various measure of activity that have been compiled from past production and cost data.

	Department X		*Department* Y	
	Normal level of	*Correlation co-*	*Normal level*	*Correlation co-*

	activity	*efficient with overheads*	*of activity*	*efficient with overheads*
Direct labour cost	Rs 15,00,000	0.8	Rs 7,20,000	0.6
Direct labour-hours	3,00,000	0.9	1,50,000	0.8
Machine-hours	90,000	0.5	6,00,000	0.9

During April, the company received an invitation from a regular customer to bid on a job which, if won, would be executed in May. The job was estimated to require Rs 1,50,000 of materials and to involve:

	Department X	*Department* Y
Direct labour cost	Rs 75,000	Rs 33,000
Direct labour-hours	15,000	6,000
Machine-hours	3,000	21 ,000

How much overhead would you include in the bid? Estimate the bid price, the company should quote, assuming the company's normal practice of charging 20 per cent on cost price as profit.

Job Cost Sheet to Determine the Tender Price

Particulars	*Amount*		*Amount*
Direct materials			Rs 1,50,000
Direct labour cost:			
Department X	Rs 75,000		
Department Y	33,000		1,08,000
Prime cost			2,58,000
Add overhead costs			
Department X:			
Fixed (15,000 × Rs 2.40)	36,000		
Variable (15,000 × Rs *2)*	30,000	Rs 66,000	
Department Y:			
Fixed (21 ,000 × Rs 1 .80)	37,800		
Variable (21 ,000 × Rs 1 .50)	31,500	69,300	1 ,35,300
Factory cost			3,93,300
Add estimated profit @ 20 per cent on cost			78,660
Bid price			4,71,960

Working Notes

Determination of overhead rates:

Department X [Direct labour hours (DLH) has been taken as basis as there is the highest correlation between DLH and overhead incurred]

Fixed = Rs 7,20,000 / 3,00,000

DLH = Rs 2.40

Variable = Rs 6,00,000 / 3,00,000

DLH = Rs 2.00

Department Y [Machine-hour rate (MHR) has been taken as the basis as there is the highest correlation between MHR and overhead]:

Fixed = Rs 10,80,000 / 6,00,000 = Rs 1.80

Variable = Rs 9,00,000 / 6,00,000 = Rs 1.50

21. Anup Ltd. is engaged in making standard products which pass through three departments. The cost figures of the factory for the month of November of the current year are furnished below:

		Departments		
Particulars	Total	A	B	C
Direct materials	Rs 18,600	Rs 7,500	Rs 6,400	Rs 4,700
Labour cost	15,000	6,000	5,000	4,000
Total overhead expenditure	7,500	3,000	2,500	2,000
	41,100	16,500	13,900	10,700

Prepare a simple cost sheet for products X and Y on the basis of data furnished below:

	Departments		
	A	B	C
Product X — Material	Rs 100	Rs 200	Rs 300
— Labour	50	60	70
Product Y — Material	50	90	140
— Labour	70	60	80

Solution

Cost Sheet of Products X and Y for the Month of November

Particulars	Total cost		Percentage of total cost	
	X	Y	X	Y
Department A				
Direct materials	Rs 100	Rs 50	Rs 11.50	Rs 8.40
Direct labour	50	70	5.74	11.77
Overheads (0.50 × direct wages)	25	35	2.87	5.88
(a) Total	175	155	20.11	26.05
Department B				

Direct materials	200	90	22.99	15.13
Direct labour	60	60	6.90	10.09
Overhead (0.50 × direct wages)	30	30	3.45	5.04
(b) Total	290	180	33.34	30.26
Department C				
Direct materials	300	140	34.48	23.53
Direct labour	70	80	8.05	13.45
Overhead (0.50 × direct wages)	35	40	4.02	6.72
(c) Total	405	260	46.55	43.70
Total (a + b + c)	870	595	100.00	100.00

Note It is obvious from the cost figures of November that the firm is following the percentage of labour cost method as the basis of recovering overheads.

22. You are required to prepare a cost-sheet of Ramesh Ltd. showing the actual and estimated cost of a batch of 100 units from the following information: The batch passes through 3 departments, A, B and C. Materials used for the batch:

Department A—600 units @ Rs 10 per unit

Department B—50 units @ Rs 20 per unit Direct labour

Department A—100 hours @ Rs 2 per hour

Department B—20 hours @ Rs 2.50 per hour

Department C—100 hours @ Rs 1.50 per hour Factory overhead

Department A—150 per cent on direct wages

Department B—Rs 10 per labour hour

Department C—66.67 per cent on direct wages.

After the batch is complete, 100 units of raw materials issued to department A are found to be surplus and are returned to stores.

A comparison of the actual costs with the estimated costs of the direct materials and the factory overhead has shown that the actual costs exceed the respective estimated costs by 20 per cent, whereas the actual labour costs is 25 per cent lower than the estimated costs.

You are required to show in the cost sheet, the costs of the batch and the difference between the estimated costs and the actual costs. Show detailed workings separately.

Solution

Batch Cost Sheet (100 units)

Special remarks ..... Batch no .....

Date started ..... Date finished .....

	Cost		
	Actual	*Estimated*	Adverse *(A)* *Favourable (F)*
Materials: (Requisition no....)			
Department A (600 units × Rs 10) Rs 6,000			
Less returns (100 units × Rs 10) 1,000	Rs 5,000	Rs 4,167	Rs 833A
Department B (50 units × Hs 20)	1,000	833	167A
Direct labour:			
Department A (100 hours × Rs 2)	200	250	50F
B (20 hours × Rs 2.50)	50	62	12F
C (100 hours × Rs 1.50)	150	188	38F
Factory overhead:			
Department A (200 × Rs 1 .5)	300	250	50A
B (20 × Rs 10)	200	167	33A
C (150 × Rs 0.67)	100	83	17A
Total	7,000	6,000	1 ,000A

Summary of Variances: Department -wise

	Actual	*Estimated*	*Variance*
Department A: Materials	Rs 5,000	Rs 4,167	Rs 833A
Labour	200	250	50F
Overheads	300	250	50A
Total	5,500	4,667	833A
Department B: Materials	1,000	833	167A
Labour	50	62	12F
Overheads	200	167	33A
Total	1,250	1,062	188A
Department C: Materials	150	188	38F

Labour	100	83	17A
Total	250	271	21 F

23. Adeshwar Ltd. has undertaken to supply 200 pieces of a component per month for the ensuing 6 months. Every month a batch order is opened against which materials and labour-hours are booked at actuals; overheads are levied at a per/labour hour rate. The selling price contracted for is Rs 8 per piece. From the following data, present the cost and profit per piece of each batch order and overall position of the order for 1,200 pieces:

Months	*Batch output*	*Material cost*	*Direct wages*	*Direct labour-hours*
January	210	Rs 650	Rs 120	240
February	200	640	140	280
March	220	680	150	280
April	180	630	140	270
May	200	700	150	300
June	220	720	160	320

The other details are:

Month	*Chargeable expenses*	*Direct labour-hours*
January	Rs 12,000	Rs 4,800
February	10,560	4,400
March	12,000	5,000
April	10,580	4,600
May	13,000	5,000
June	12,000	4,800

Solution

Batch Cost Sheet for Six Months (January to June)

Month	*Materia l*	Cost *of production*			*Batch (units)*	*output Cost per unit (5 X 6)*	*Selling price per unit*	*Profit (loss) per unit*
		Direct wages	*Overheads* *	*Total*				
(D	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
January	Rs 650	Rs 120	Rs 600	Rs. 1,370	Rs 210	Rs 6.52	Rs 8	Rs 1 .48
February	640	140	672	1,452	200	7.26	8	0.74
March	680	150	672	1,502	220	6.83	8	1.17
April	630	140	621	1,391	180	7.73	8	0.27
May	700	150	780	1,630	200	8.15	8	(0.15)
June	720	160	800	1,680	220	7.64	8	0.36

4,020	860	4,145	9,025	1,230

*Overheads = (Direct labour-hours × Labour-hour rate) Labour-hour rate = (Chargeable expenses / Direct labour-hours)

Overall Position of the Order of 1,200 Units

Sale revenue (1,200 × Rs 8)		Rs 9,600
Less cost of production	[Rs. 9,025 / 1,230 *1,200]	8,805
Profit		795

24. In Sarvoday Ltd. a plant installed 20 years ago at a cost of Rs 30,000 is still in use though its book value has been brought down to Re 1 (nominal). The cost figure of its output per mensum are given below:

Electrical power	Rs 300
Repairs and maintenance	450
Consumable stores	50
Wages of 12 workers (gross)	1,800
Raw materials (production)	26,000
Overheads allocated	2,400
	31,000

Units produced: 20,000, sold at Rs 2 per unit, selling expenses being Rs 3,000 per mensum. The management scrapped this plant and installed a more efficient modern plant and particulars of its womngs are given below:

Cost of new plant installed (subject to 10 per cent depreciation per annum)		Rs 1,35,000
Electric power		750
Repairs and maintenance		650
Consumable stores		100
Wages of 12 workers (existing)		2,700
Salaries of new mechanics and machinemen:		
2 mechanics, Rs 250 each	Rs 500	
3 mechanics, Rs 300 each	900	1,400
Overheads allocated		3,600

The new plant utilises raw materials costing Rs 80,000 per mensem and produces 70,000 units which are sold at Rs 2.10 each. The selling expenses increased to Rs 7,000 per mensem. The plant cost and additional capital outlay involved in increasing stock of raw materials and extended credit to customers was financed by a 9% Debenture issue for Rs 3,00,000, the proceeds of which were wholly utilised on the change-over from old to new plant. This change also involved lay-off of workers and the wages paid to them during the period and other losses due to non-working of the

plant for a period of two months amounted to Rs 24,000 and it was decided by the management that the loss should be absorbed in production accounts in the remaining period of eight months in the current financial year.

You are required to prepare a comparative cost sheet for the last month of working of the old plant and the first month's working of the new plant indicating the monthly profit and loss on account of the change-over.

Assume that realisation on the sale of old plant is adjusted in the estimated loss of Rs 24,000 and ignore interest on extended credit to customer for which no indication has been given.

Solution

Comparative Cost Sheet Showing the Effect of Change of the Existing Plant to the New One on the Profits of the Firm

	Old plant (20,000 units)			New plant (70,000 units)		
Particulars	Total cost	Unit cost	Per cent to price	Total cost	Unit cost	Per cent to total sale price
Raw materials	Rs 26,000	Rs 1.30	Rs 65.0	Rs 80,000	Rs 1.14	Rs 54.28
Wages	1,800	0.09	4.5	2,700		
Salaries of new mechanics/ machinemen				1,400	0.058	2.77
Prime cost	27,800	1.39	69.5	84,100	1.198	57.05
Add factory overheads						
Electric power	300			750		
Repair and maintenance	450	0.04	2.0	650	0.020	0.95
Consumable stores	50			100		
Depreciation for 1 month:						
Old plant (book value)	___	___	___			
New plant (0.10 × Rs 1,35,000)7 12 months				1,125	0.016	0.76
Factory cost	28,600	1.43	71.5	86,725	1.234	58.76
Add other miscellaneous overheads:						
Allocated overheads	2,400	0.12	6.00	3,600	0.045	2.14
Interest on debentures for one month (Rs 3,00,000 × 0.09 × 1/12)				2,250	0.032	1.52
Loss due to change-over of the plant to be spread over 8 months (Rs 24,000 ÷ 8)				3,000	0.043	2.05
Cost of production	31 ,000	1.55	77.5	95,575	1.354	64.47
Add selling overheads	3,000	0.15	7.5	7,000	0.100	4.76

Cost of sales	34,000	1.70	85.0	1 ,02,575	1.454	69.23
Profit (balancing figure)	6,000	0.30	15.0	44,425	0.646	30.77
Sales revenue	40,000	2.00	100.0	1 ,47,000	2.100	100.00

Notes

1. Since expenses related to factory are separately given, allocated overheads are assumed to be administrative overheads.
2. Interest normally should not form part of cost sheet. But it has been taken into account here as the purpose of the exercise is to ascertain the comparative cost of production; the interest is clubbed with general overheads and not shown separately as a financial charge. Likewise, loss due to change-over is dealt with. Alternatively, both these expenses could have been shown as direct expenses.

25. The following is the trial balance of Shah Ltd engaged in the execution of Contract 786 for the year ending March 31 of the current year:

	Dr Amount	*Cr Amount*
Amount received (contractor's account)		Rs 3,00,000
Buildings	Rs 1,60,000	
Creditors		72,000
Bank balance	35,000	
Capital account		5,00,000
Materials	2,00,000	
Wages	1,80,000	
Expenses	47,000	
Plant	2,50,000	
Total	8,72,000	8,72,000

The work on Contract 786 had commenced on April 1 of the current year. Materials costing Rs 1,70,000 were sent to the site of the contract but those costing Rs 6,000 were destroyed in an accident. Wages amounting to Rs 1,80,000 were paid during the year. Plant costing Rs 50,000 was used on the contract all through the year. Plant with a cost of Rs 2,00,000 was used from April 1 to December 31 and was then returned to the stores. Materials of the cost of Rs 4,000 were at site on March 31.

The contract was for Rs 6,00,000 and the work certified was 80 per cent of the total contract work at the end of the year. Uncertified work was estimated at Rs 15,000 on March 31. Expenses are charged to contract at 25 per cent of wages. Plant is to be depreciated at 10 per cent for the entire year.

Prepare Contract 786 account for the current year ending March 31 and make out the balance sheet as on that date in the books of Premier Construction Company Ltd Also prepare contractee's account.

Solution

Contract A/c (786) for the Year Ending March 31

	Dr Amount		*Cr Amount*
To materials	Rs 1,70,000	By profit and loss A/c(abnormal	
To wages	1 ,80,000	loss due to materials destroyed	Rs 6,000
To plant (Rs 50,000 +	2,50,000	In an accident)	
Rs 2,00,000)			
To expenses allocated to		By plant at site (Rs 50,000 -	
contract (0.25 × Rs 1 ,80,000)	45,000	Rs 5,000, depreciation	
To profit c/d	90,000	@ 1 0 per cent for the full year)	45,000
		By plant returned to store	
		(Rs 2,00,000 - Rs 15,000, depre-	
		ciation @ 10 per cent for 9 months)	1,85,000
		By materials at site	4,000
		By *work-in-process:*	
		Work certified (0.80 × Rs 6,00,000)	4,80,000
		Work uncertified	15,000 .
	7,35,000		7,35,000
To profit and loss A/c'	37,500	By profit b/d	90,000
To reserve for unforeseen			
contingencies[2]	52,500		
	90,000		90,000

Determination of profit (to be transferred to profit and loss account)

Estimated profit × 2/3 × Cash received / Work certified

or Rs 90,000 × 2/3 × Rs 3,00,000 / Rs. 4,80,000 = Rs. 37,500

[2]Reserve for unforeseen contingencies = Rs 90,000 - Rs 37,500 = Rs 52,500

General Profit and Loss Account

To abnormal loss	Rs 6,000	By contract A/c (747)	Rs 37,500
To absorbed expenses (Rs 47,000 - Rs 45,000)	2,000		
To depreciation on plant (Rs 2,00,000 for 3 months @ 10 per cent)	5,000		
To net profit	24,500		
	37,500		37,500

Contractee 's Account

To balance c/d	3,00,000	By bank	3,00,000
		By balance b/d	3,00,000

Balance Sheet as on at March 31

Liabilities	*Amount*	*Assets*	*Amount*
Capital	Rs 5,00,000	Buildings	Rs 1,60,000
Profit and loss A/c	24,500	Plant in store	
Creditors	72,000	(Rs 2,00,000 - Rs 20,000)	1 ,80,000
		Plant at site (Rs 50,000 - Rs 5,000)	45,000
		Materials in store (Rs 2,00,000- Rs1, 70,000)	30,000
		Materials at site	4,000
		Work-in-process:	
		Work certified Rs 4,80,000	
		Work uncertified 15,000	
		Less reserve for unfore-	
		seen contingencies (52,500)	
		Less cash received from contractee (3,00,000)	1 ,42,500
		Bank balance	35,000
	5,96,500		5,96,500

26. In Shivani Ltd., six hundred kgs of material was charged to process I at the rate of Rs 4 per kg. The direct labour accounted for Rs 200 and the other departmental expenses amounted to Rs 760. The normal loss is 10 per cent of input. During the period, the actual production was 500 kgs and 100 kgs was scrap. Assuming that the scrap is saleable at Rs 2 per kg, prepare a ledger account of process I, showing the values of normal and abnormal losses.

Solution

Process I Account

Particulars	*Units (kgs)*	*Amount*	*Particulars*	*Units (kgs)*	*Amount*
To materials	600	Rs 2,400	By normal loss (600 × 0.10)	60	Rs 120
To wages		200	By abnormal loss	40	240
To departmental expenses		760	By process II (500 units transferred at Rs 6 each)	500	3,000
	600	3,360		600	3,360

Working Notes

Cost per unit = (Rs 3,360 - Rs 120)/ 540 units = Rs 6

Amount of abnormal loss

Units introduced	600
Less normal loss (10 per cent)	60
Normal output expected	540
Less actual output achieved	500
Abnormal loss (units)	40
(×) Cost per unit	Rs6
Total loss	240
Less sale value of scrap (40 × Rs 2)	80
Total	160

27. Alap Ltd. manufacture four sizes of formica board, A, B, C and D in its workshop and transfers them to the sales department at a profit of 50 per cent on transfer price. The workers are paid piece rates of Rs 2, Rs 4, Rs 6 and Rs 8 per board for sizes A, B, C and D respectively. Dearness allowance at flat rate of Rs 10 per direct labour day is distributed among workers. Miscellaneous direct payments to workers are 25 per cent of the basic wages. From the following information for the month of July, you are required to find out the total cost per board of each size and its transfer price:

Sizes	A	B	C	D
Direct labour day	100	200	300	200
Number of boards manufactured	4,000	2,500	2,000	1,500
Direct materials	Rs 25,000	Rs 15,000	Rs 20,000	Rs 20,000
Workshops' overhead				
Indirect materials	Rs 4,800			
Indirect labour	4,000			
Indirect expenses	8,000			

Indirect materials are to be apportioned on the basis of direct material- cost and remaining expenses are to be allocated on the basis of direct labour days.

Solution

Statement of Cost of Production and Profit of Formica Board (A,B,C and D) for the Month Ending July

Particulars	Total cost				Cost per unit			
	A	B	C	D	A	B	C	D
	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs
Direct materials	25,000	15,000	20,000	20,000	6.25	6.00	10.00	13.34
Direct wages[@]	11,000	14,500	18,000	17,000	2.75	5.80	9.00	11.33
Prime cost	36,000	29,500	38,000	37,000	9.00	11.80	19.00	24.67
Add factory overheads								
Indirect materials (0.10 × direct material cost): (Rs 8,000 ÷ 80,000)	2,500	1,500	2,000	2,000	0.63	0.60	1.00	1.33
Indirect labour (in proportion of number of labour days (1:2:3:2)	500	1,000	1,500	1,000	0.12	0.40	0.75	0.67
Indirect expenses (1:2:3:2)	1,000	2,000	3,000	2,000	0.25	0.80	1.50	1.33
Factory cost/cost of production	40,000	34,000	44,500	42,000	10.00	13.60	22.25	28.00
Add 50 per cent of transfer price	40,000	34,000	44,500	42,000	10.00	13.60	22.25	28.00
Transfer price	80,000	68,000	89,000	84,000	20.00	27.20	44.50	56.00

@ Determination of Direct Wages

	A	B	C	D
Piece wages (number of boards × wage rate)	Rs 8,000	Rs 10,000	Rs 12,000	Rs 12,000
Dearness allowance (labour days × Rs 10)	1,000	2,000	3,000	2,000
Miscellaneous payments (0.25 × piece wages)	2,000	2,500	3,000	3,000
	11,000	14,500	18,000	17,000

28. Junior Ltd. supplies a forge component to an automobile manufacturer. The existing forging machine has been in use for 6 years. An improved forge is available in the market. The comparative features of both are given below:

	Existing forge	New forge
Original cost	Rs 1,20,000	Rs 2,40,000
Life (years)	10	10
Labour cost per annum	6,000	8,000
Fuel	24,000	36,000
Power	10,000	14,000
Consumables	12,000	20,000
Repairs and maintenance	12,000	18,000
Tooling	8,000	20,000
Production per hours (numbers)	10	20
Number of hours working per year (on two-shift basis)	4,000	4,000
Rejection on inspection (per cent)	6	2

Work out a comparative cost of production statement for the two machines. Assume there is no salvage value for both the machines. Use straight line depreciation and ignore interest and taxation.

Solution

Comparative Conversion Cost of Production Statement for Two Machines, Namely, Existing Forge and New Forge

Particulars	Total cost		Cost per unit	
	Existing forge	New forge	Existing forge	New forge
Number of working hours per year	4,000	4,000	—	—
(x) Production per hour	10	20	—	—
Production units (gross)	40,000	80,000	—	—
Less rejection on inspection	(2,400)	(1,600)		
Good units produced	37,600	78,400		
Conversion costs@				
Labour cost	Rs 6,000	Rs 8,000	Rs 0.160	Rs 0.102
Fuel	24,000	36,000	0.638	0.459
Power	10,000	14,000	0.266	0.179
Consumables	12,000	20,000	0.319	0.255
Repairs and maintenance	12,000	18,000	0.319	0.229
Tooling	8,000	20,000.	0.213	0.255
Depreciation (original)	12,000	24,000	0.319	0.306
Total cost	84,000	1 ,40,000	2.234	1.785

@Since raw materials cost is not given in the present problem, statement of cost of production is confined only to conversion costs.

29. Rahim Ltd is engaged in the process engineering industry. During the month of April, 2,000 units were introduced in process X, the normal loss was estimated at 5 per cent of input. At the end of the month, 1,400 units had been produced and transferred to process Y; 460 units were incomplete and 140 units had to be scrapped during the process. The incomplete units had reached the following stages of completion: Material, 75 per cent; Labour, 50 per cent; Overhead, 50 per cent. Further information on process X:

Cost of the 2,000 units	Rs 58,000
Additional direct material	14,400
Direct labour	33,400
Direct overhead	16,700

Scrapped units realised Rs 10 each.

Prepare a statement of equivalent production, statement of cost, statement of apportionment of cost and process × account.

Solution

Statement of Equivalent Production

Input	*Particulars*	*Number of units (completed or otherwise)*	*Stage completion (per cent)*			*Equivalent units (units × stage of completion)*		
			Material	*Labour*	*Over-heads*	*Material*	*Labour*	*Over-heads*
2,000	Units introduced		100	100	100	1,400	1,400	1,400
	Units produced	1,400						
	Normal loss (0.5 × 2,000)	100	—	—	—	—	—	—
	Abnormal loss (140 units -100, normal)	40	100	100	100	40	40	40
	Closing inventory	460	75	50	50	345	230	230
		2,000				1,785	1,670	1,670

Statement of Cost

Particulars	*Total cost*	*Equivalent production(units)*	*Cost per unit*
Materials			
Cost of units introduced	Rs 58,000		
Additional direct material	14,400		
	72,400		
Less sale proceeds of scrap material (100 units Rs 10)	1,000		
	71 ,400	1,785	Rs 40
Direct labour	33,400	1,670	20
Direct overheads	16,700	1 ,670	10
	1 ,21 ,500		70

Statement of Apportionment of Cost

Particulars	*Element of cost*	*Equivalent production*	Cost per unit	*Cost*	*Total cost*
Finished production	Material	1,400	Rs 40	Rs 56,000	
	Labour	1,400	20	28,000	
	Overhead	1,400	10	14,000	Rs 98,000
Abnormal loss	Material	40	40	1,600	
	Labour	40	20	800	
	Overhead	40	10	400	2,800
Work-in-process	Material	345	40	13,800	
	Labour	230	20	4,600	
	Overhead	230	10	2,300	20,700
					1,21,500

Process X Account

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To raw material	2,000	Rs 58,000	By normal loss	100	Rs 1,000
To other direct materials		14,400	By abnormal loss	40	2,800
To direct labour		33,400	By process Y (trans-	1,400	98,000
To direct overheads		16,700	ferred @ Rs 70)		
			By work-in-process	460	20,700
	2,000	1 ,22,500		2,000	1 ,22,500

30. The following information relates to a building contract of Amitabh Ltd. for Rs 30,00,000.

	Year 1	*Year 2*
Materials issued	Rs 9,00,000	Rs 2,52,000
Direct wages	6,90,000	3,15,000
Direct expenses	66,000	30,000
Indirect expenses	18,000	4,200
Work certified	22,50,000	30,00,000
Work uncertified	24,000	-
Materials at site	15,000	21,000
Plant issued	42,000	6,000
Cash received from contractee	18,00,000	30,00,000

The value of the plant at the end of years 1 and 2 was Rs 21,000 and Rs 15,000 respectively: Prepare: (i) The contract account; (ii) The contractee account; and (iii) Show how the various relevant figures would appear in the assets side of the balance sheet.

Solution

Contract A/c for the End of Year 1

Particulars i	*Or Amount*	*Particulars*	*Cr Amount*
To materials	Rs 9,00,000	By materials at site	Rs 15,000
To direct wages	6,90,000	By plant at site	21,000
To direct expenses	66,000	By work-in-progress	
To indirect expenses	18,000	Work certified	22,50,000
To plant	42,000	Work uncertified	24,000
To profit c/d	5,94,000		
	23,10,000		23,10,000
To profit and loss account		By profit b/d	5,94,000
(Rs 5,94,000 × 2/3 × Rs 18,00,000) / Rs 22,50,000	3,16,800		
To reserve for unforeseen contingencies	2,77,200		
	5,94,000		5,94,000

Contract Account for the End of Year 2

Particulars	*Dr Amount*	*Particulars*	*Cr Amount*
To work-in-progress b/d	Rs 22,74,000	By reserve for unforeseen	
To materials at site	15,000	contingencies	Rs 2,77,200
To plant at site	21 ,000	By materials at site	21,000
To materials	2,52,000	By plant at site	15,000
To direct wages	3,15,000	By contractee's A/c	30,00,000
To direct expenses	30,000		
To indirect expenses	4,200		
To plant issued	6,000		
To profit and loss A/c	3,96,000		
	33,13,200		33,13,200

Contractee's Account

Year end 1 To balance c/d	18,00,000	Year end 1	By bank	18,00,000
	18,00,000			18,00,000
Year end 2 To contract A/c	30,00,000	Beginning year 2	By balance b/d	18,00,000
		Year end 2	By bank	

		(balance received)	12,00,000
	30,00,000		30,00,000

Balance Sheet (skeleton) as at the End of Year 1)

Liabilities	*Amount Assets*	*Amount*
	Materials at site	Rs 15,000
	Plant at site	21,000
	Work-in-process:	
	Work certified	Rs 22,50,000
	Work uncertified	24,000
	Less reserve for	
	unforeseen contingencies	(2,77,200)
	Less cash received	(18,00,000) 1,96,800
	Balance Sheet as at the End of Year 2	
	Materials at site	Rs 21,000
	Plant at site	15,000

31. A Tony Ltd. earns an average net profit of Rs 3 per piece of a toy on a selling price of Rs 15 by producing and selling 60,000 pieces at 60 per cent of the potential capacity. The composition of cost of sales is:

Direct material :	Rs 4
Direct wages :	1
Works overheads :	6 (50 per cent fixed)
Sales overheads :	1 (25 per cent variable)

During the current year, he intends to produce the same number but anticipates that:

1. His fixed charges will go up by 10 per cent
2. Rates of direct labour will increase by 20 per cent
3. Rates of direct material will increase by 5 per cent
4. Selling price cannot be increased

Under these circumstances, he obtains an order for a further 20 per cent of his capacity. What minimum price will you recommended for accepting an order to ensure the manufacturer an overall profit of Rs 1,83,500?

Solution

Statement Showing the Cost of Production and Profit at 60,000 Units

Particulars	Total cost	Cost per unit
Direct materials (Rs 4 × 105 × 60,000) + 100	Rs 2,52,000	Rs 4.20
Direct labour (Rs 1 × 120 × 60,000) ÷100	72,000	1.20
Prime cost	3,24,000	5.40
Add factory overheads: Variable (60,000 × Rs 3)	1,80,000	3.00
Fixed (Rs 3 × 60,000) = Rs 1,80,000+10 per cent	1,98,000	3.30
Factory cost/cost of production	7,02,000	11.70
Add selling and distribution overheads:		
Variable (60,000 × Rs 0.25)	15,000	0.25
Fixed (60,000 × Rs 0.75) = Rs 45,000+10 per cent	49,500	0.825
Cost of sales	7,66,500	12.775
Profit (balancing figure)	1 ,33,500	2.225
Sales revenue (60,000 × Rs 15)	9,00,000	15.000

Statement Showing Determination of Minimum Price to be Quoted for Special Order of 20,000 Units

Particulars	Total cost	Cost per unit
Relevant cost of production:		
Direct materials	Rs 84,000	Rs4.20
Direct labour	24,000	1.20
Variable works overhead	60,000	3.00
Variable sales overhead	5,000	0.25
Total incremental cost of production	1,73,000	8.65
Add profit expected from special order (Rs1 ,83,500-Rs 1 ,33,500)	50,000	2.50
Minimum price	2,23,000	11.15

32. Alok Ltd. produces 8,000 units per month, per unit split-up cost and sales value of which are given below:

Direct material	Rs 30
Direct labour	20
Fixed overhead (Rs 2,00,000)	25
Variable overhead	40

	115
Selling and distribution expenses:	
Fixed (Rs 80,000)	10
Variable	15
	140
General administration (fixed Rs 2,40,000)	30
Margin of profit (subject to taxation)	5
Sales value	175

Due to increase in demand and consequent extension of delivery dates and dissatisfaction among customers, the management decided to provide for an output of 12,000 units per month in the next year (against anticipated demand of 15,000 units), which would involve a capital outlay of -Rs 6,00,000 on which interest and financial charge would amount to 10 per cent per annum.

Prepare a comparative consolidated cost statement showing anticipated margin of profit for the present output (of 8,000 units) and the proposed output (of 12,000 units).

Assume that in the coming year there will be an all-round increase of 5 per cent in the different items of expenses except fixed expenses.

If the proposal is adopted, due to the proposed increase in output, there will be an increase of 25 per cent in fixed overheads, 20 per cent in fixed selling and distribution expenses and 10 per cent in general administration, apart from the interest and financial charges.

If it is decided to maintain the present level of sales, an increase of 2 per cent in sales price is possible and this figure should be taken for the level of production at 8,000 units per month.

Solution

Consolidated Cost Statement Showing Margin of Profit at Present and Proposed (8,000 and 12,000) Output levels

	Total cost		Cost per unit	
Particulars	8,000 units	12,000 units	8,000 units	2,000 units
Direct materials	Rs 2,52,000	Rs 3,78,000	Rs 31.5	Rs 31.5
Direct labour	1,68,000	2,52,000	21.0	21.0
Prime cost	4,20,000	6,30,000	52.5	52.5
Add factory overheads:				
Fixed	2,00,000	2,50,000	25.0	20.83
Variable overheads	3,36,000	5,04,000	42.0	42.00
Factory cost	9,56,000	13,84,000	119.5	115.33

Add general overheads:				
Fixed	2,40,000	2,64,000	30.0	22.00
Interest charges (Rs 6,00,000 × 0.10 × 1/12)		5,000	—	0.42
Cost of production	11,96,000	16,53,000	149.5	137.75
Add selling and distribution overheads:				
Fixed	80,000	96,000	10.0	8.00
Variable	1 ,26,000	1,89,000	15.75	15.75
Cost of sales	14,02,000	19,38,000	175.25	161.50
Margin of profit	26,000	1 ,62,000	3.25	13.50
Sales revenue	14,28,000	21,00,000	178.50@	175.00@

@Sale price would increase by 2 per cent (Rs 175 + Rs 3.50). @@Sale price would remain unchanged.

33. For Rafiq Ltd., as on March 31, of the current year, Rs 4,89,000 has been expended upon a contract and certificates of value of work certified have been received to date of the value of Rs 6,00,000. The cost of work uncertified. on the date was estimated at Rs 15,000. Upto the end of the previous year, profit of Rs 30,000 had been taken on the contract. It is estimated that the contract will take a further 4 months to complete and that it will necessitate an additional expenditure of Rs 1,00,000. The total estimated expenditure upon the contract is to include a provision of 5 per cent for contingencies. The contract price is Rs 7,20,000 and Rs 5,40,000 has been received in cash to date. Determine the amount of profit to be credited to profit and loss account.

Solution

Computation of Profit

Particulars	*Amount*
Total expenditure upto March 31	Rs 4,89,000
Add additional estimated expenditure	1 ,00,000
	5,89,000
Add provision for contingencies (5 per cent on total estimated expenditure 5/95 × Rs 5,89,000)	31,000
Total estimated expenditure on contract	6,20,000
Contract price	7,20,000
Estimated total profit (Rs 7,20,000 - Rs 6,20,000)	1 ,00,000
Cumulative profit to be taken to profit and loss account	75,000
Less already credited to the profit and loss account of the previous year	30,000
Profit to be credited to current year profit and loss account	45,000

34. The finished output of Ramesh Ltd. passes through two processes, the entire material being introduced at the beginning of the first process. From the following production and cost data relating to the first process, work out the value of closing inventory and the value of materials transferred to the second process. Also prepare process I account.

Process I: Opening stock, 10,000 units at Rs 50,000

Stage of completion of opening inventory: Materials, 100 per cent; Labour, 60 per cent; Overheads; 50 percent.

Units introduced during the process: 50,000 units at Rs 1,44,000; Direct labour, Rs 81,000; Overheads, Rs 80,000.

Units transferred to next process, 38,000

Spoilage during the process (units), 7,000

Stage of completion of closing inventory, 15,000 units: Material, 100 per cent; Labour, 50 per cent;

Overheads, 40 per cent.

Normal loss, 10 per cent of input.

Sale value of spoilage, Rs 2 per unit.

Solution

Statement of Cost

Particulars	*Total cost*	*Equivalent production (units)*	*Cost per unit*
Materials	Rs 1,44,000		
Less sale value of normal scrap (6,000 × Rs 2)	12,000		
	1,32,000	44,000	Rs3
Direct labour	81,000	40,500	2
Overheads	80,000	40,000	2
	2,93,000		7

Statement of Equivalent Production

Input units	Particulars	*Number of units (completed or otherwise*	*Stage completion (per cent)*			*Equivalent units (units × stage of completion)*		
			Material	*Labour*	*Over heads*	*Material*	*Labour*	*Over-heads*
10,000	Opening stock (100 per cent stage of completion)	10,000	Nil	40	50	—	4,000	5,000
50,000	Units started and completed (38,000 - 10,000, opening inventory)	28,000	100	100	100	28,000	28,000	28,000
	Normal loss (0.10 × 60,000)	6,000	—	—	—	—	—	—
	Abnormal loss (7,000-6,000)	1,000	100	100	100	1,000	1,000	1,000
	Closing work-in-process	15,000	100	50	40	15,000	7,500	6,000
60,000		60,000				44,000	40,500	40,000

Note FIFO method of cost flow has been assumed.

Statement of Apportionment of Cost

Particulars	*Element of cost*	*Equivalent production*	*Cost per unit*	*Total cost*	
Opening inventory (combined)	—	—	—	Rs 50,000	—
	Material	—	—	—	—
	Labour	4,000	Rs2~	8,000	
	Overheads	5,000	2	10,000	Rs 68,000
Units introduced and completed	Material	28,000	3	84,000	
	Labour	28,000	2	56,000	
	Overheads	28,000	2	56,000	1 ,96,000
Abnormal loss	Material	1,000	3	3,000	
	Labour	1,000	2	2,000	
	Overheads	1,000	2	2,000	7,000
Closing work-in-	Material	15,000	3	45,000	
process	Labour	7,500	2	15,000	
	Overheads	6,000	2	12,000	72,000

Process I Account

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To opening work-in-	10,000	Rs 50,000	By normal loss	6,000	12,000
process			By abnormal loss	1,000	7,000
To direct material costs	50,000	1 ,44,000	By process II (Rs 68,000 +	38,000	2,64,000
To direct labour		81 ,000	Rs 1,96,000)		
To overheads		80,000	By work-in-process	15,000	72,000
	60,000	3,55,000		60,000	3,55,000

35. The following figures are extracted from the books of Ravi Ltd. after the close of the year:

Raw materials opening stock	Rs 14,000
Purchases during the year	1,00,000
Closing inventory	10,000
Direct wages	20,000
Works overhead (50 per cent on direct wages)	

Stores overhead on materials, 10 per cent on the cost of materials, 10 per cent of the casting were rejected being not upto specification and a sum of Rs 800 was realised from sale of scrap; 10 per cent of the finished casting were found to be defective in manufacture and were rectified by expenditure of additional works overhead charges to the extent of 20 per cent on the proportionate direct wages. The total gross output of casting during the year was 2,000 tonnes.

Find out the manufacturing cost of the saleable casting per tonne.

Solution

Cost Sheet Determining Manufacturing Cost of the Saleable Casting

Particulars		Total cost	Cost per unit
Direct materials consumed:			
Opening stock	Rs 14,000		
Add purchases	1,00,000		
Less closing stock	(10,000)	Rs 1,04,000	Rs 57.778
Direct wages		20,000	11.111
Prime cost		1,24,000	68.889
Add works overheads			
Factory overheads (0.50 × direct wages)		10,000	5.556
Stores overhead (0.10 × Rs 1,04,000)		10,400	5.778
Less scrap realised (0.10 × 2,000 tonnes)		(800)	(0.444)
Rectification cost of 10 per cent of good castings (2,000 tonnes - 200 tonnes) = 1800 tonnes × 0.10 = 180 tonnes) (Rs 20,000 × 180 × 20) ÷ (2,000 × 100)		360	0.200
Manufacturing cost of good castings (1,800 tonnes)		1,43,960	79.98

36. Anish Ltd. a repute manufactures four varieties of a product, namely, A, B, C, and D. If the company manufactures only one variety, the monthly production can be either 5,000 of A, or 10,000 of B or 15,000 of C or 30,000 of D. From the following information, you are required to find the profit or loss made on each variety, showing direct cost, works cost and total cost:

	A	B	C	D
Actual production in a month	675	1,800	4,050	9,450
Direct wages	Rs 3,000	Rs 5,500	Rs 7,500	Rs 21,000
Direct materials cost	3,500	6,500	9,000	27,500
Sales price per unit	30	20	15	12

Overhead expenses for the month are Rs 81,000. Selling and distribution cost is to be calculated at 10 per cent of works cost. Overhead expenses are to be allocated to

each variety on the basis of units produced.

Solution

Statement of Costs and Profits for Products A, B, C, and D

Particulars	Products				Total
	A	B	C	D	
Direct wages	Rs 3,000	Rs 5,500	Rs 7,500	Rs 21,000	Rs 37,000
Direct materials	3,500	6,500	9,000	27,500	46,500
Prime/Direct cost	6,500	12,000	16,500	48,500	83,500
Add factory overheads (see working notes)	12,150	16,200	24,300	28,350	81,000
Work cost	18,650	28,200	40,800	76,850	1,64,500
Add selling and distribution cost	1,865	2,820	4,080	7,685	16,450
Total cost	20,515	31,020	44,880	84,535	1,80,950
Profit/(Loss)	(265)	4,980	15,870	28,865	49,450
Sales revenue	20,250	36,000	60,750	1,13,400	2,30,400

Working Note

Determination of factory overheads: Production in equivalent units expressed as follows: A, = 5,000 units or B, 10,000 units or C, 15,000 units or D, 30,000 units. Alternatively: 1 unit of A = 2 units of B (10,000 ÷ 5,000); 3 units of C (15,000 ÷ 5,000); 6 units of D (30,000 ÷ 5,000). A: B: C: D = 1:2:3:6. The overhead allocation should be determined by applying weights in the reverse order, that is 6:3:2:1 (A:B:C:D).

Products	Production (units)	Weight	Total weighted value	Overheads allocated
A	675	6	4,050	[(Rs 81,000 × 4,050)÷27,000] = Rs 12,150
B	1,800	3	5,400	[(Rs 81,000 × 5,400) ÷ 27,000] = 16,200
C	4,050	2	8,100	[(Rs 81,000 × 8,100) ÷ 27,000] = 24,300
D	9,450	1	9,450	[(Rs 81,000 × 9,450) ÷ 27,000] = 28,350
			27,000	81,000

37. Rati Ltd. processes a range of products including a detergent, 'Washo', which passes through 3 processes before completion and transfer to the finished goods warehouse. During April, data relating to this product were as follows:

	Process 1	*Process II*	*Process III*	*Total*
Basic raw material (10,000 units)	Rs 6,000	—	—	Rs 6,000
Direct raw material added in process	8,500	9,500	5,500	23,500
Direct wages	4,000	6,000	12,000	22,000
Direct expenses	1,200	930	1,340	3,470
P reduction-overhead				16,500
Output (units)	9,200	8,700	7,900	
Normal loss in process of input (per cent)	10	5	10	
Scrap value loss per unit	0.20	0.50	1	

The production overhead is absorbed as a percentage of direct wages. There was no stock at the start or at the end of any process.

You are required to prepare the following accounts: (i) Process I; (ii) Process II; (iii) Process III; (iv) Abnormal loss; and (v) Abnormal gain.

Solution

Process I Account

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To raw materials	10,000	Rs 6,000	By normal loss		Rs 200
			(0.10 × 10,000)	1,000	
To other direct raw			By process II (transferred @		
materials		8,500	Rs 2.50 per unit:		
To direct wages		4,000	Rs 22,500÷9,000)	9,200	23,000
To direct expenses		1,200			
To manufacturing					
overheads [0.75 ×					
(Rs 16,500 ÷ Rs 22,000)					
of wages]		3,000			
To abnormal gain					
(9,200 - 9,000,					
normal output)	200	500			
	10,200	23,200		10,200	23,200

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To output transferred			By normal loss	460	Rs 230
			(0.05 × 9,200)		
from process 1	9,200	Rs 23,000	By process III (transferred		
To direct raw materials		9,500	@ Rs 5: Rs 43,700 ÷ 8,740)	8,700	43,500
To direct wages		6,000	By abnormal loss		
			(8,740 normal		
To direct expenses		930	output - 8,700)	40	200
To manufacturing					
overheads					
(0.75 × Rs 6,000)		4,500			
	9,200	43,930		9,200	43,930

Process III Account

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To output transferred			By normal loss	870	Rs 870
			(8,700 × 0.10)		
from process II	8,700	Rs 43,500	By finished stock A/c		
To direct material		5,500	(final output transferred		
To direct wages		12,000	@ Rs 9 per unit)	7,900	71,100
To direct expenses		1,340			
To manufactured					
overhead					
(0.75 × Rs 12,000)		9,000			
To abnormal gain					
(7,900 - 7,830,					
normal output)	70	630			
	8,770	71,970		8,770	71,970

Abnormal Loss Account

To process II	40	200	By sale proceeds of scrap @ Rs 0.50 per unit	40	20
			By profit @ loss A/c (loss transferred)		180
	40	200		40	200

Abnormal Gain Account

To normal loss			By process I A/c	200	500
Process I	200	40	By process III A/c	70	630
Process II	70	70			
To profit and loss account (profit transferred)		1,020			
	270	1,130		270	1,130

38. Adinath Ltd. processes a patent material used in buildings. The material is produced in three consecutive grades: soft, medium and hard. The details of its operations are as follows:

	Process I	*Process II*	*Process III*
Raw material used (tonnes)	1,000		
Cost per tonne	Rs 200		
Total manufacturing expenses	87,500	Rs 39,500	Rs 10,710
Weight lost (per cent of input of the process)	5	10	20
Scrap (Sale price Rs 50 per tonne) (tonnes)	50	30	51
Sale price per tonne	350	500	800

Management expenses were Rs 7,500 and selling expenses, Rs 5,000. Two-thirds of the output of process I and one-half of the output of process II is passed on to the next process and the balance is sold. The entire output of process III is sold.

Prepare relevant process accounts.

Solution

Process I Account

Particulars	*Tonnes*	*Amount*	*Particulars*	*Tonnes*	*Amount*
To direct raw materials	1,000	Rs 2,00,000	By weight lost	50	—
To manufacturing expenses		87,500	By scrap sales	50	Rs 2,500
To profit		10,000	By sales (900 × 1/3)	300	1,05,000
			By Process II (Rs 2,85,000 × 2/3)	600	1,90,000
	1,000	2,97,500		1,000	2,97,500

Process II Account

Particulars	*Tonnes*	*Amount*	*Particulars*	*Tonnes*	*Amount*
To process I			By weight lost	60	—
(transferred from)	600	Rs 1,90,000	By scrap sales	30	Rs 1,500
To manufacturing		39,500	By sales (510 × 1/2)	255	1 ,27,500
expenses					
To profit		13,500	By process III (transferred) (Rs 2,28,000 × 1/2)	255	1,14,000
	600	2,43,000		600	2,43,000

Process III Account

Particulars	*Tonnes*	*Amount*	*Particulars*	*Tonnes*	*Amount*
To process II			By weight loss	51	—
(transferred from)	255	Rs 1,14,000	By scrap sales	51	Rs 2,550
To manufacturing expenses		10,710	By sales	153	1 ,22,400
To profit		240			
	255	1,24,950		255	1 ,24,950

Statement of Profit

Profit from		
Process I	Rs 10,000	
II	13,500	
III	240	
Total		Rs 23,740
Less: management expenses	7,500	
selling expenses	5,000	12,500
Net profit		11,240

Note Weight lost as well as scrap material is assumed to be normal loss.

39. Javed Ltd. enters into a contract to construct a building for Rs 8,00,000. Work began in April of the current year and it is estimated that the contract will take 16 months to complete. Work is proceeding on schedule and the costs charged to the contract at the end of the current year are as follows:

Material used	Rs 2,00,000
Materials returned	10,000
Wages	2,60,000
Plant hire and other expenses	65,000
Establishment charges	50,000
Additional information	
Materials at site	Rs 5,000
Work certified upto date	6,50,000
Cash received on account	6,00,000
Work not certified	15,000
It is estimated that the following further expenditure will be incurred to complete the work:	
Materials	Rs 15,000
Labour	20,000
Sub-contractors	50,000
Plant hire and other expenses	15,000
Establishment charges	10,000

Prepare the contract account indicating the amount to be credited to the profit and loss account of the current year, assuming provision for contingencies amounting to 5 per cent of the total cost is to be made and the contractor's cash position is satisfactory.

Solution

Contract Account for the Year Ending March 31

Particulars	*Dr Amount*	*Particulars*	*Cr Amount*
To materials	Rs 2,00,000	By materials returned	Rs 10,000
To wages	2,60,000	By materials at site	5,000
To plant hire and other expenses	65,000	By *work-in-process*	
To establishment expenses	50,000	Work certified	6,50,000
To profit c/d	1,05,000	Work uncertified	15,000
	6,80,000		6,80,000
Profit and loss account	72,698	By profit b/d	1 ,05,000
To reserve for contingencies	32,302		
	1,05,000		1,05,000

Computation of Estimated Profit

Expenditure upto March 31			Rs 5,60,000
Add estimated expenditure to complete the contract:			
Materials at site	Rs 5,000		
Add required	15,000	Rs 20,000	
Labour		20,000	
Sub-contractors		50,000	
Plant hire and other expenses		15,000	
Establishment charges		10,000	1,15,000
			6,75,000
Add provision for contingencies (5 × Rs 6,75,000) / 95			35,526
Total estimated cost			7,10,526
Contract price			8,00,000
Estimated profit			89,474

Proportion of profit to be carried to current year profit and loss account = (Rs 89,474 × Rs 6,50,000) 4-Rs 8,00,000 = Rs 72,698

40. The Marqus Ltd has just completed operations for the current year. The company's assistant accountant (who is very inexperienced) prepared the following profit and loss account for the year's activities:

Sales		Rs 32,00,000
Operating expenses		
Insurance	Rs 40,000	
Gas, electricity and water	1,00,000	
Direct labour cost	6,00,000	
Indirect labour cost	1 ,20,000	
Depreciation on factory equipment	1,60,000	
Raw materials purchased during the year	12,00,000	
Rent	4,00,000	
Selling and administration overheads	3,20,000	29,40,000
Net profit		2,60,000

You have been asked to assist the company is preparing a correct profit and loss account for the year. The following additional information is available:

1. The company is a manufacturing firm that produces a product for sale to outside customers.

2. 80 per cent of the rent paid applies to factory operations and the remainder to selling and administrative activities.

3. No raw materials were on hand on April 1. However, raw materials of the value of Rs 1,50,000 purchased during the year were still on hand on March 31. The remainder was used in production during the year.

4. 70 per cent of the insurance and 90 per cent of the gas, electricity and water charges paid apply to factory operations; the remainder apply to selling and administrative activities.

5. Work-in-progress and finished goods inventories were:

	April 1	April 30
Work-in-progress	Rs 4,20,000	Rs 4,80,000
Finished goods	5,40,000	4,00,000

You are required to prepare:

(a) A statement of cost of goods manufactured in the current year, and

(b) A corrected profit and loss account for the year ended March 31.

Solution

(a) Statement of Cost of Goods Manufactured for the Current Year:

Particulars		Amount
Direct material used		
Direct material purchases	Rs 12,00,000	
Less closing stock	1 ,50,000	Rs 10,50,000
Direct labour		6,00,000
Prime cost		16,50,000
Add factory overheads		
Indirect labour	1 ,20,000	
Rent (Rs 4,00,000 × 0.80)	3,20,000	
Insurance (Rs 40,000 × 0.70)	28,000	
Gas, electricity and water (0.90 × Rs 1 ,00,000)	90,000	
Depreciation on factory equipment	1,60,000	7,18,000
Grass works cost		23,68,000
Add opening work-in-process		4,20,000
Less closing work-in-process		(4,80,000)
Cost of goods manufactured		23,08,000

Profit and Loss A/C for the Year Ended March 31

Particulars	Dr Amount		Particulars	Cr Amount
To cost of goods sold			By sales	Rs 32,00,000
Opening stock	Rs 5,40,000			
Add cost of goods manufactured (a)	23,08,000			
Less closing stock	(4,00,000)	Rs 24,48,000		
To administrative and selling expenses:				
Selling and administrative overheads	3,20,000			
Rent (0.20 × Rs 4,00,000)	80,000			
Insurance (0.30 × Rs 40,000)	12,000			
Gas, electricity and water (0.10 × Rs 1,00,000)	10,000	4,22,000		
To profit		3,30,000		
		32,00,000		32,00,000

41. From the following data calculate the cost per km of a vehicle for Janab Transport Ltd.

Value of vehicle	Rs 15,000
Road license for the year	500
Insurance charges per year	100
Garage rent per year	600
Driver's wages per month	200
Cost of petrol per litre	0.80
Proportional charge for tyre and maintenance per km	0.20
Estimated life (kms) 1,50,000	
Estimated annual mileage (kms)	6,000
Petrol consumption (kms/litre)	8

Solution

Operating Cost Statement to Determine Cost Per km

Particulars	Total annual cost of 6,000 kms	Cost per km
(A) Standing charges:		
Road licence fee for the year	Rs 500	Rs 0.083
Insurance charges for the year	100	0.017
Garage rent per year	600	0.100
Driver's wages per year (Rs 200 × 12)	2,400	0.400
Total	3,600	0.600
(B) Running charges:		
Depreciation of vehicle (Rs 15,000 × 6,000) ÷1,50,000	600	0.100
Cost of petrol (Rs 0.80 × 6,000) + 8	600	0.100
Tyre and maintenance	1,200	0.200
Total	2,400	0.400
(C) Total running cost per km (A+B)	6,000	1.00

42. Kanchan Ltd undertakes a long-term contract, which involves the fabrication of pre-stressed concrete blocks and the erection of the same on consumer's site.

The following information is supplied regarding the contract, which is incomplete on March 31 of the current year:

Fabrication costs to date:		
Direct materials		Rs 2,80,000
Direct Labour		90,000
Overheads		75,000
		4,45,000
Erection costs to date		15,000
Total cost incurred		4,60,000
Contract price		8,19,000
Cash received on account		6,00,000
Technical estimate of work completed to date:		
Fabrication		
Direct price	80 per cent	
Direct labour and overheads	75 per cent	
Erection	25 per cent	

You are required to prepare a statement for submission to the management indicating:

1. The estimated profit on the completion of the contract, and

2. The estimated profit-to-date on the contract.

Solution

1. *Statement Showing Estimated Profit to be Carried to Profit and Loss Account for the Current Year Ended March 31*

Expenditure upto March 31:		
Direct materials	Rs 2,80,000	
Direct labour	90,000	
Overheads	75,000	
Erection costs to date	15,000	Rs 4,60,000
Add estimated expenditure to complete the contract::		
Direct materials (Rs 2,80,000 × 20) / 80	70,000	
Direct labour and overheads (Rs 1 ,65,000 × 25) / 75	55,000	
Erection cost (Rs 15,000 × 75) / 25	45.000	1,70,000
Total estimated cost		6,30,000
Contract price		8,19,000
Estimated profit		1 ,89,000

2. Proportion of profit to be carried to current year's profit and loss account:

Estimated total profit × Cost of work to date / Estimated total cost

= Rs 1,89,000 × Rs 4,60,000 / Rs. 6,30,000)

=138,000,00

43. Rachna Ltd. undertook a contract for Rs 15,00,000 on an arrangement that 80 per cent of the value of the work done, as certified by the architect of the contractee, should be paid for immediately and that the remaining 20 per cent be retained until the contract was completed.

In year 1, the amounts expended were: Materials, Rs 1,80,000; Wages, Rs 1,70,000; Carriage, Rs 6,000; Cartage, Rs 1,000; Sundry expenses, Rs 3,000. The work was certified for Rs 3,75,000 and 80 per cent of this was paid as agreed.

In year 2, the amounts expended were: Materials, Rs 2,20,000; Wages, Rs 2,30,000; Carriage, Rs 23,000; Cartage, Rs 2,000; Sundry expenses, Rs 4,000.-Three-fourths of the contract was certified as done by March 31, and 80 per cent of this was received accordingly. The value of unused stock and work-in-process uncertified was ascertained at Rs 20,000.

In year 3, the amounts expended were: Materials, Rs 1,26,000; Wages, Rs 1,70,000; Cartage, Rs 6,000; Sundry expenses, Rs 3,000 and on September 30, the whole contract was completed. Show how the contract account and also the contractee's account would appear in each of these years in the books of the contactor, assuming

that the balance due to him was paid on completion of the contract.

Solution

Contract Account for the Year Ending 1

Particulars	*Dr Amount*	*Particulars*	*Cr Amount*
To materials	Rs 1,80,000	By work-in-process	
To wages	1,70,000	Work certified	Rs 3,75,000
To carriage	6,000		
To cartage	1,000		
To sundry expenses	3,000		
To profit c/d	15,000		
	3,75,000		3,75,000
To profit and loss account		By profit b/d	15,000
(Rs 15,000 × 1 ×80) ÷ (3× 100)	4,000		
To reserve for unforeseen contingencies	11 ,000		
	15,000		15,000

Contract Account for the Year Ending 2

To work-in-process	Rs 3,75,000	By reserve for unforeseen	
To materials	2,20,000	contingencies	Rs 11,000
To carriage	23,000	By *work-in-process*	
To wage	2,30,000	Work certified	
To cartage	2,000	(3 × Rs 15,00,000) / 4	11 ,25,000
To sundry expenses	4,000	Work uncertified	20,000
To profit c/d	3,02,000		
	11,56,000		11,56,000
To profit and loss A/c	1,61,067	By profit b/d	3,02,000
(Rs 3,02,000 × 2 × 80) / (3 × 100)			
To reserve for unforeseen contingencies	1 ,40,933		
	3,02,000		3,02,000

Contract Account for the Year Ending 3

To work-in-process b/d	Rs 11,45,000	By reserve for unforeseen	
To materials	1,26,000	contingencies	Rs 1,40,000
To wages	1 ,70,000	By contractee's A/c	15,00,000
To cartage	6,000		
To sundry expenses	3,000		
To profit and loss A/c	1 ,90,933		
	16,40,933		16,40,933

Contractee's Account

Year end 1 To balance c/d	Rs 3,00,000	Year end 1	By bank A/c	Rs 3,00,000
	3,00,000			3,00,000
Year end 2 To balance c/d	9,00,000	Year 2 beginning	By balance c/d	3,00,000
		Year 2 end	By bank	6,00,000
	9,00,000			9,00,000
Year end 3 To contract A/c	15,00,000	Year 3 beginning	By balance b/d	9,00,000
		Year 3 end	By bank (balance received)	6,00,000
	15,00,000			15,00,000

44. Adinath transport service company is running four buses between two towns, 50 kms apart. Seating capacity of each bus is 40 passengers. The following particulars were obtained from their books:

Wages of drivers, conductors and cleaners	Rs 2,400
Salaries of office and supervisory staff	1,000
Diesel and other oil	4,000
Repairs and maintenance	800
Taxation, insurance, etc.	1 ,600
Depreciation	2,600
Interest and other charges	2,000
	14,400

Actual passengers carried were 75 per cent of the full capacity. All the four buses run on all days of the month. Find out the cost per passenger-km.

Solution

Operating Cost Statement Determining Cost Per Passenger-km (3,60,000 Passenger-kms)

Particulars	Total cost	Cost per passenger-km
(A) Standing charges:		
Wages of drivers, conductors and cleaners	Rs 2,400	Rs 0.007
Salaries of office and supervisory staff	1,000	0.003
Taxation, insurance, etc.	1,600	0.004
Interest and other charges	2,000	0.005
Total	7,000	0.019
(B) Running charges:		
Diesel and other oils	4,000	0.011
Repairs and maintenance	800	0.002
Depreciation	2,600	0.007
Total	7,400	0.021*
(C) Total cost per passenger-km (A+B)	14,400	0.040

Working Notes

Determination of passenger-kms = (Buses × capacity × distance × 2 × days) × 0.75 = (4 × 50 × 40 × 2 ×0.75) = 3,60,000.

45. The Dubai Bus Company Ltd operates a number of buses in Delhi city. The firm's buses make 200 trips per week with an average distance of 50 kms. Fares are Rs 0.10 per km per passenger and each bus can carry 40 passengers. The firm has the following cost structure.

Driver's pay, Rs 200 per week per driver	Rs 4,000
Conductors' pay, Rs 1 50 per week per conductor	3,000
Other salaries and wages	3,000
Depreciation and maintenance of buses	5,000
Petrol, diesel and variable .costs (per bus per km)	1

Determine the firm's weekly income if it operates with its buses on an average 75 per cent utilisation.

Solution Statement of Operating Cost and Profit for a Week (3,00,000 Passenger-kms)

Particulars		Amount
(A) Revenue (3,00,000 × Rs 0.10)		Rs 30,000
(B) Operating costs		
(a) Standing charges:		
Driver's pay	Rs 4,000	
Conductor's pay	3,000	
Other salaries and wages	3,000	
Total	10,000	
(b) Punning costs:		
Depreciation and maintenance	5,000	
Petrol diesel and other variable costs (Rs 1×1 0,000 kms)	10,000	
Total	15,000	
(c) Total costs (a + b)		25,000
(C) Profit (A - B)		5,000

Determination of passenger-kms = (Trips × kms × passengers capacity) × 0.75 = (200 × 50 × 40) × 0.75 = 3,00,000 kms

46. In Rastogi Ltd. a product passes through three processes, A, B, and C. The output of process A and B is charged to the next process at a price calculated to give a profit of 16.67 per cent on transfer price while the output of process C is charged to the finished stock account at a profit of 13.33 per cent on the transfer price. From the following particulars, prepare the process cost accounts and calculate the amount of reserve that should be made in respect of the stock in hand.

	Process A	*Process B*	*Process C*
Materials and labour	Rs 7,000	Rs 2,800	Rs 4,800
Closing stock	2,000	2,800	2,000

There was no stock in hand at the beginning of the period. The closing stocks are valued at prime cost in each process.

Solution

Process A Account

Particulars	*Amount*	*Particulars*	*Amount*
To materials and labour	Rs 7,000	By closing stock	Rs 2,000
To profit (Rs 6,000 × 0.1667)	1,000	By process B (Rs 5,000 × 120/100)	6,000
	8,000		8,000

Process B Account

Particulars	*Amount*	*Particulars*	*Amount*
To process A	Rs 6,000	By closing stock	Rs 2,800
To material and labour	2,800	By process C (Rs 6,000 × 120/100)	7,200
To profit (Rs 7,200 × 0.1667)	1,200		
	10,000		10,000

Process C Account

Particulars	*Amount*	*Particulars*	*Amount*
To process B	Rs 7,200	By closing stock	Rs 2,000
To materials and labour	4,800	By finished goods (10,000 × 115.38/100)	11,538
To profit (Rs 11,538 × 0.1333)	1,538		
	13,538		13,538

Working Notes

1. Profit of 16.67 per cent on transfer means 20 per cent on cost price.

2. Likewise, profit of 13.33 per cent on transfer price means 15.38 per cent on cost.

3. Provision for unrealised profit: *Process A:* Nil

   Process B: (Rs 1,000 × 2,800)/8,800 = Rs 318

   Process C: Closing stock of process C of Rs 2,000 is made up of respective cost proportions of C: B, that is, 2:3 (Rs 4,800: Rs 7,200).

   Process C's share is = Rs 2,000 × 2/5 = Rs 800

   Process B's share is = Rs 2,000 × 3/5 = Rs 1,200

   Profit included in Rs 1,200 (process B's cost) is = Rs 1200 × 20/120 = Rs 200
   (i) Profit included in Rs 1,000. This includes part of process A's costs: Rs 1,000 × 60/88= Rs 682. Rs 682 includes profit element of = Rs 682 × 20/120 = Rs 113
   (ii) Total profit included in process C = Rs 313 (200 +113) (i + ii)

Statement of Profit

Process A		Rs 1,000
Process B	Rs 1,200	
Add provision for unrealised profit	318	882
Process C	1,538	
Less provision for unrealised profit	313	1,225
Profit realised		3,107

Alternatively

Process A Account

Particulars	*Total*	*Cost*	*Profit*	*Particulars*	*Total*	*Cost*	*Profit*
To materials and labour	Rs 7,000	Rs 7,000		By closing stock	Rs 2,000	Rs 2,000	—
To profit (Rs5,000 50/3 X 3/250	1,000	—	Rs 1,000	By process B (transferred)	6,000	5,000	Rs 1,000
	8,000	7,000	1,000		8,000	7,000	1,000

Process B Account

	Total	*Cost*	Profit		Total	*Cost*	*Profit*
To process A	Rs 6,000	Rs 5,000	Rs 1,000	By Closing stock (2,800 × 1 ,000)			
To materials and labour	2,800	2,800	_	÷8,800	Rs 2,800	Rs 2,482	Rs 318
To profit and loss A/c				By process C (transferred)	7,200	5,318	1,882
(Rs 6,000 × (50 × 3) ÷ (3 × 250))	1,200		1,200				
	10,000	7,800	2,200		10,000	7,800	2,200

Process C Account

To process B	Rs 7,200	Rs 5,318	Rs 1,882	By closing stock	Rs 2,000	Rs 1,687	Rs 313
To materials and labour	4,800	4,800	—	By finished goods A/c (at 115.38 per cent of cost)	11,538	8,431	3,107
To profit and loss A/c (0.1333 × Rs 11,538)	1,538	—	1,538				
	13,538	10,118	3,420		13,538	10,118	3,420

47. The following particulars are obtained from the books of Siddhivinayak Ltd. as on March 31 of the current year:

Plant and equipment at cost Rs 4,90,000

Vehicles at cost 2,00,000

Details of contract which remain uncompleted as on March 31:

	Contract numbers		
	V. 20	V. 24	V. 25
Estimated final sales value	8,00,000	5,60,000	16,00,00
Estimated final cost	6,40,000	7,00,000	12,00,000
Wages	2,40,000	2,00,000	1 ,20,000
Materials	1 ,00,000	1,10,000	44,000
Overheads (excluding depreciation)	1 ,44,000	1 ,46,000	58,000
Total costs to date	4,84,000	4,56,000	2,22,000
Value certified by architects	7,20,000	4,20,000	2,40,000
Progress payments received	5,00,000	3,20,000	2,00,000

Depreciation of plant and equipment and vehicles should be charged at 20 per cent to the three contracts in proportion to work certified. You are required to prepare statements to show contract-wise and over-all: (i) profit/loss to be taken to the profit and loss account for the year ended March 31. (ii) work-in-process as would appear in the balance sheet as March 31.

SOLUTION

Statement of Profit/loss to be Taken to Profit and Loss A/c for the year Ending March 31

	Contract numbers			
	V. 20	*V. 24*	*V. 25*	*Total*
(A) 1 . Estimated final contract price	Rs 8,00,000	Rs 5,60,000	Rs 16,00,000	—
2. Work certified by architects	7,20,000	4,20,000	2,40,000	—
3. Percentage of completion [(2) as per cent (1)]	90	75	15	—
(B) 1 . Estimated final contract price	8,00,000	5,60,000	16,00,000	—
2. *Less* estimated final costs	6,40,000	7,00,000	12,00,000	—
3. Estimated profit (loss)	1 ,60,000	(1,40,000)	4,00,000	—
(C) 1. Work certified	7,20,000	4,20,000	2,40,000	13,80,000
2. *Less cost incurred:*				
Wages	2,40,000	2,00,000	1 ,20,000	5,60,000
Materials	1,00,000	1,10,000	44,000	2,54,000
Overheads (excluding depreciation)	1 ,44,000	1,46,000	58,000	3,48,000
Depreciation (working note 1)	72,000	42,000	24,000	1 ,38,000
Notional profit (loss) [(1)-(2)]	1 ,64,000	(78,000)	(6,000)	80,000
Profitless) to be taken to profit and loss A/c	1 ,00,000	(1,40,000)[@]	(6,000)	(46,000)
Reserve for future contingencies	64,000	62,000	—	1 ,26,000

@Rs 7,00,000, estimated financial cost - Rs 5,60,000, estimated sales value. *Statement of Work-in-process as Would Appear in the Balance Sheet as on March 31*

	V. 20	*V. 24*	*V. 25*	*Total*
Work certified	Rs 7,20,000	Rs 4,20,000	Rs 2,40,000	Rs 13,80,000
Less reserve for future contingenies	64,000	62,000	—	1 ,26,000
Less payments received	5,00,000	3,20,000	2,00,000	10,20,000
Work-in-process	1,56,000	38,000	40,000	2,34,000

Working Notes

1. Total depreciation [0.20 × (Rs 4,90,000 + Rs 2,00,000)] = Rs 1,38,000

Depreciation is apportioned to three contracts in proportion to work certified: Rs 7,20,000; Rs 4,20,000; and Rs 2,40,000:

Contract V. 20: Rs. 7,20,000 / Rs. 13,80,000 × Rs 1,38,000 = Rs 72,000

Contract V. 24: Rs. 4,20,000 / Rs. 13,80,000 × Rs 1,38,000 = Rs 42,000

Contract V. 25: Rs 2,40,000 / Rs.13,3380,000 × 1,38,000 = Rs 24,000

2. Profit to be estimated: Estimated total cost × Value of work certified / Contract price × Cash received / Work certified

=Rs. 1,00,000

3. Loss transferred:

Contract	Amount
V. 24	Rs 1,40,000
V. 25	6,000

48. For Ravi Ltd., Iron ore is transported from two mines, A and B and unloaded at plots in a railway station. A is at a distance of 10 kms and B is at a distance of 15 kms from the railway plots. A fleet of lorries of 5-tonne carrying capacity is used for transport of ore from mines. Records reveal that lorries average a speed of 30 kms per hour when running and regularly take 10 minutes to unload at the railhead. At mine A, loading time averages 30 minutes per load while at mine B, loading time averages 20 minutes per load.

Driver's wages, depreciation, insurance, and taxes are found to cost Rs 9 per hour of operating. Fuel, oil, tyres, repairs and maintenance cost Rs 1.20 per km. Draw up a statement shownig the per tonne-km cost of carrying iron ore from each mine.

SOLUTION

Operating Cost Statement Determining Cost Per Tonne-km of Carrying Iron Ore from Two Mines, A and B

		Mine A	Mine B
1.	Distance from railway station (one way) (kms)	10	15
2.	Distance from railway station (both ways or length of journey per trip)	20	30
3.	Speed of lorries (kms per hour)	30	30
4.	Time taken per trip (2) ÷ (3) (minutes)	40	60
5.	Loading time at mines (minutes)	30	20
6.	Unloading time at railway station (minutes)	10	10
7.	Total time taken per trip (4 + 5 + 6)	80	90
8.	Driver's wages, depreciation, insurance and taxes per hour (Rs)	9	9
9.	Driver's wages, depreciation insurance etc. per trip	12*	13.50"
10.	Fuel, oil, tyres, repairs and maintenance cost (Rs per km)	1.20	1.20
11.	Fuel oil, tyres, repairs, etc. per trip (2) × (10)	24	36
12.	Total cost (9 + 10)	36	49.50
13.	Total tonne-kms (kms × capacity)	50	75
14.	Cost per tonne-km (12 4- 13) (Rs)	0.72	0.66

* = (80 × Rs 9) ÷ 60 ** = (90 × Rs 9) ÷ 60

49. Akkhil Ltd makes a product which passes through two processes before it is completed and transferred to finished stock. The following data related to the month of December:

Particulars	*Process 1*	*Process II*	*Finished stock*
Opening stock	Rs 7,500	Rs 9,000	Rs 22,500
Direct materials	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 per cent profit on the transfer price. Output of process II is transferred to finished stock at 20 per cent profit on the transfer price. Stocks in process are valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales during the period were Rs 1,40,000.

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

SOLUTION

Process I Account

Particulars	*Total*	*Cost*	*Profit*	*Particulars*	*Total*	*Cost*	*Profit*
To opening stock F	Rs 7,500	Rs 7,500	—	By process II — (Rs 40,500 — ×133.33/100)	Rs54,000	Rs40,500	Rs 13,500
To direct materials	15,000	15,000					
To direct wages	11,200	11,200					
Less closing stock	(3,700)	(3,700)					
Prime cost	30,000	30,000					
To factory overheads/ process cost	10,500	10,500					
Process cost	40,500	40,500					
To profit & loss A/c(0.25 × Rs 54,000)	13,500		Rs 13,500				
	54,000	40,500	13,500		54,000	40,500	13,500

Process II Account

Particulars	*Total*	*Cost*	*Profit*	*Particulars*	*Total*	*Cost*	*Profit*
To opening stock	Rs 9,000	Rs 7,500	Rs 1,500	By finished stock (Rs 90,000 × 125/100)	Rs 1,12,500	Rs 75,750	Rs 36,750
To process I (transferred from)	54,000	40,500	13,500				
To direct materials	15,750	15,750	—				
To direct wages	11,250	11,250	—				
Less closing stock	(4,500)	(3,750)	(750)				
Prime cost	85,500	71,250	14,250				
To factory overheads	4,500	4,500					
Process cost	90,000	75,750	—				
To profit & loss A/c	22,500	—	22,500				
	1,12,500	75,750	36,750		1,12,500	75,750	36,750
To opening stock	Rs 22,500	Rs 14,250	Rs 8,250	By closing stock	Rs 11,250	Rs 7,500	Rs 3,750
To Process II (transferred from)	1,12,500	75,750	36,750	By sales	1 ,40,000	82,500	57,500
To profit & loss A/c (profit transferred)	16,250		16,250				
	1,51,250	90,000	61.250		1,51,250	90,000	61,250

Working Notes

1. If Rs 90,000 prime cost includes Rs 15,000 profit, then Rs 4,500 closing stock would include: Rs 15,000 × Rs 4,500)/Rs 90,000 = Rs 750

2. *Statement of Profit*

Particulars		Amount
Process 1:		Rs 13,500
Process II:	Rs 22,500	
Adjustment: provision for unrealised profit		
Add for opening stock	1,500	
Less for closing stock	750	23,250
Finished stock account	16,250	
Adjustment of provision for unrealised profit		
Add for opening stock	8,250	
Less for closing stock	3,750	20,750
		57,500

3. If Rs 1,35,000 includes Rs 45,000 profit, then Rs 11,250 closing stock would include: (Rs 45,000 × Rs 11,250) ÷ Rs 1,35,000 = Rs 3,750

50. Anup, a practising chartered accountant now spends Rs 0.90 per km on taxi fare for his client's work. He is considering two other alternatives: the purchase of a new small car or an old big car. The estimated costs figure are:

	New small car	Big old car
Purchase price	Rs 35,000	Rs 20,000
Sale price of car after 5 years	19,000	12,000
Repairs and servicing per year	1,000	1,200
Taxes and insurance per year	1,700	700
Petrol price per litre	3	3
Petrol consumption (kms/litre)	10	7

He estimates that he covers 10,000 kms annually. Which of these alternatives will be cheaper? If his practice expands and he has to cover 19,000 kms per annum, what should be his decision?

SOLUTION

Comparative Operating Cost Statement

	Particulars	Total cost			
		10,000 kms per year		19,000 kms per year	
		New small car	Big old car	New small car	Big old car
(A)	Standing charges: Taxes and insurance per year	Rs 1,700	Rs 700	Rs 1,700	Rs 700
(B)	Running charges:				
	Repair and servicing per year	1,000	1,200	1,000	1,200
	Depreciation per year (purchase				
	price-salvage value) ÷ 5	3,200	1,600	3,200	1,600
	Cost of petrol	3,000	4,286	5,700	8,143
Total		7,200	7,086	9,900	10,943
(C)	Total operating cost (A+B)	8,900	7,786	11,600	11,643

Conclusions: (i) Buying the big old car would be cheaper at 10,000 kms. (ii) Buying the new small car would be cheaper at 19,000 kms. However, it is important to recognise the interest cost. The new small car requires a cash outlay of Rs 15,000 over and above the big old car. Assuming 10 per cent interest, the total cost of the new small car-would be Rs 11,600 + Rs 1,500 (Rs 15,000 × 0.10) and the decision would be different.

51. Adeshwar transport company supplies the following details in respect of a truck of 5 tonne capacity.

Cost of truck	Rs 1,80,000
Diesel, oil, grease (per trip each way)	30
Repairs and maintenance (per month)	1,500
Driver's (monthly) wages	1,500
Cleaner-cum-attendant's wages (monthly)	750
Insurance (per year)	9,000
Road licence (per year)	3,600
General supervision charges (per year)	6,000
Estimated life (years)	10

The truck carries goods to and from the city covering a distance of 50 kms each way. While going to the city, freight is available for a full load of the truck and on its return journey it can fetch freight only up to 20 per cent of its capacity.

On the assumption that the truck runs on an average 25 days a month, you are required to determine the following: (i) Operating cost per tonne-km, (ii) Rate per tonne per trip that the company should charge if profit of 100 per cent on cost is to be earned, and (iii) What price would you charge if one wants to engage the truck for one day for a trip to the city and back?

SOLUTION

Operating Cost Statement to Determine Cost Per km

Particulars	Total cost per month of 7,500 tonne-kms	Cost per tonne-km
(A) Standing charges		
Driver's wages	Rs 1,500	Rs 0.200
Cleaner-cum-attendant's wages	750	0.100
Insurance (Rs 9,000 ÷ 12)	750	0.100
Road licence (Rs 3,000 ÷ 12)	250	0.033
General supervision (Rs 6,000 ÷ 12)	500	0.067
Total	3,750	0.500
(B) Running charges		
Depreciation Rs 1,80,000 ÷ (12 × 10)	1,500	0.200
Diesel, oil, grease (Rs 30 × 50 trips that is, 2 trips daily for 25 days)	1,500	0.200
Repairs and maintenance	1,500	0.200
Total	4,500	0.600
(C) Total cost per tonne-km (A+B)	8,250	1.100

Working Notes

(i) Determination of tonne-km per month:

Trip to city: 50 kms ×5 tonnes capacity × 25 days	6,250
Return back from city: 50 kms × 25 days × 1 tonne	1,250
	7,500

(ii) Determination of freight rate:

Cost per tonne	Rs 1.10
Add desired profit of 100 per cent of cost	1.10
Freight rate per tonne-km	2.20

(iii) Quotation price:

Feight tonne-km in both trips (250 + 50)	300
Multiplied by freight rate per tonne-km	Rs 2.20
	660

52. Rajpal Ltd. manufactures products X, Y and Z by processing a specific raw material in Department 1. The production process is such that every 1,100 kgs of raw materials that is put into Department 1 yields 400 kgs of X, 250 kgs of Y and 350 kgs of Z. The total cost of processing a batch of 1,100 kgs of raw materials through Department 1 is Rs 22,000. Allocate the joint costs to the three products using the physical quantity method.

SOLUTION

Joint Cost Allocation Using Unit Method

Product	*Output (kgs)*	*Rates (per cent)*	*Allocated joint cost*	*Cost per unit*
X	400	40	Rs 8,800	Rs 22
Y	250	25	5,500	22
Z	350	35	7,700	22
	1,000	100	22,000	22

53. Rajesh Ltd manufactures a single product which it sells to firms which process it further before sale. The normal quarterly operating volume for the company is 50,000 units produced and sold. The relevant cost data are as follows:

Selling price		Rs 10.00
Less *standard costs'*.		
Direct materials	Rs 3.00	
Direct labour	1.50	
Variable manufacturing overheads	1.00	
Fixed manufacturing overheads (Rs 25,000 per quarter)	0.50	
Variable selling overheads	1.00	
Fixed selling expenses (Rs 12,500 per quarter)	0.25	7.25
Standard profit per unit		2.75

The company's management is considering the possibility of further processing the product and selling it directly to the customers. The management estimates that the

product can be sold @ Rs 14 per unit after further processing. The following are the estimates of the *additional (per unit/ quarter)* costs of processing 50,000 units:

Direct labour	Rs 1.00
Variable manufacturing overheads	0.50
Variable selling costs	0.20
Additional fixed manufacturing overheads (per quarter)	10,000
Additional sales expenses (per quarter)	5,000

You are required to compute the cost (i) without, and (ii) with further processing. Is further processing advisable?

SOLUTION

Cost Comparison: Incremental Analysis

Particulars	*Without further processing*		*With further processing*		*Difference from further processing*	
	Per unit	*Total*	*Per unit*	*Total*	*Per unit*	*Total*
Sales	Rs 10.00	Rs 5,00,000	Rs 14.00	Rs 7,00,000	Rs 4.00	Rs 2,00,000
Less variables costs:						
Direct material	3.00	1,50,000	3.00	1,50,000	0.00	
Direct labour	1.50	75,000	2.50	1,25,000	1.00	50,000
Manufacturing overheads	1.00	50,000	1.50	75,000	0.50	25,000
Selling overheads	1.00	50,000	1.20	60,000	0.20	10,000
Total	6.50	3,25,000	8.20	4,10,000	1.70	85,000
Contribution	3.50	1,75,000	5.80	2,90,000	2.30	1,15,000
Less separable identifiable fixed costs:						
Manufacturing		—		10,000		10,000
Sales		—		5,000		5,000
Product margin		1,75,000		2,75,000		1 ,00,000
Less common fixed						
Manufacturing		25,000		25,000		—
Sales		12,500		12,500		—
Net income		1,37,500		2,37,500		1,00,000

Sell or Process Further: Decision Analysis

Particulars	*Product A*			*Product B*		
	Sell now	Process *further*	*Difference from further processing*	*Sell now*	*Process further*	*Differences from further processing*
Sales	Rs 6,00,000	Rs 7,00,000	Rs 1,00,000	Rs 1,50,000	Rs 1,75,000	Rs 25,000
Less separable costs	—	50,000	50,000	—	30,000	30,000
Joint cost of Rs 6,00,000 from Department - 1						
			Irrelevant as costs not affected by the decision			
Contribution (decrease)	Rs 6,00,000	6,50,000	50,000	1,50,000	1 ,45,000	(5,000)

Thus, it is profitable to process product A further because it yields an incremental profit of Rs 50,000, (additional revenue being Rs 1,00,000 and additional cost, Rs 50,000). The decision is based on the assumption that there is no other opportunity cost for using the facilities of Departments 2 and 3.

54. Compute a conservative estimate of profit on contract of Rashmi Ltd. (which has been 80 per cent complete) from the following particulars. Illustrate your methods of computing the profit.

Total expenditure to date	Rs 1,70,000
Estimated further expenditure to complete the contract (including contingencies)	34,000
Contract price	3,06,000
Work certified	2,00,000
Work not certified	17,000
Cash received	1 ,63,200

SOLUTION

Methods of computing the conservative estimates of profit (80 per cent contract complete):-

(i) (Estimated profit × Work certified) ÷ Contract price =(Rs 1,02,000 × Rs 2,00,000) /3 Rs 3,06,000 = Rs 66,667 (ii) (Estimated profit × Work certified × Cash received) / (Contract price × Work certified) = (Rs 1,02,000 × 3Rs 2,00,000) × Rs 1,63,200) / (Rs 3,06,000 × Rs 2,00,000) = Rs 54,400

(iii) (Notional profit × Work certified) / Contract price = (Rs 47,000 × Rs 2,00,000) (Rs 3,06,000 = Rs 30,719 (iv) (Notional profit × Cash received × 2/3) / Work certified = (Rs 47,000 × Rs 1,63,200 × 2/3) /3 Rs 2,00,000) = Rs 25,568

Working Notes

1. *Notional profit*

Value of work certified		Rs 2,00,000
Less: cost of work certified (Total expenditure till date - Work not certified) (Rs 1,70,000 - 17,000)		1,53,000
		47,000

2. *Estimated profit*

Contract price		*3,06,000*
Less total expenditure till date	Rs 1,70,000	
Estimated further expenditure to complete the contract	34,000	2,04,000
		1,02,000

55. The Ramdev Ltd. produces a product that goes through three processing centres for mixing, moulding and finishing. During January, the following activity took place in the mixing process centre.

	Materials		*Processing*	
	Kgs	*Percentage completed*	*Kgs*	*Percentage completed*
Opening stock	500	90	500	50
Weight of raw material issued to producing centre	9,000	-	9,000	-
Completed during the period and transferred to moulding	9,300	-	9,300	-
Closing stock	200	40	200	10

The following costs were collected from the mixing processing centre during the month: Materials, Rs 4,46,500; Processing costs, Rs 8,16,300 and Total, Rs 12,62,800. You are required to compute:

(a) Output for January, (in equivalent units of production) in the mixing centre;

(b) Unit cost for the mixing processing centre; and

(c) Material input cost per kg for the material transferred from the mixing centre to the moulding centre.

SOLUTION

(a) *Statement of Equivalent Production (Mixing Centre)*

Input		Particulars	Output (kgs) completed or otherwise	Stage of I completion (per cent)		equivalent units produced	
				Material	Processing	Materials	Processing
500 kgs +	(i)	Work expended on opening inventories	500	10	50	50	250
9,000 kgs introduced	(ii)	kgs input started and completed during					
during the year		the current period (9,000-200)	8,800	100	100	8,800	8,800
	(iii)	Closing inventory	200	40	10	80	20
9,500		(Work-in-process)	9,500			8,930	9,070

(b) *Determination of Unit Costs for Mixing Centre*

	Materials	Processing
1 . Costs to be accounted for	Rs 4,46,500	Rs 8,16,300
2. Equivalent units produced	8,930	9,070
3. Equivalent unit cost per kg (1) ÷ (2)	50	90

(c) Total material input cost per kg of material transferred from mixing centre to the moulding centre = Rs 140 per kg (Rs 50 + Rs 90).

56 Navjot cement manufacturing company is facing the problem of transportation of limestone from its quarry. The quarry is situated 25 kms away and the only means of transport available is the roadways. The company has received quotations from some of the local transporters at Rs 12, Rs 12.50 and Rs 13 per tonne of limestone transported, with an escalation clause in respect of diesel/oil costs. The quantity of limestone to be transported per month is 24,000 tonnes. While examining the feasibility of departmental transport the following facts come to be recgonised.

1. Two types of trucks are available in the market, namely, 10-tonners and 8-tonners.

2. Details of operating costs for the trucks are:

	10-tonners	8-tonners
Purchase price	Rs 2,50,000	Rs 2,00,000
Estimated useful life (years)	5	5
Residual value	40,000	20,000
Km per litre of diesel (kms)	3	4
Estimated repairs and maintenance cost per truck per month	2,000	1,600
Vehicle and road tax per quarter	600	600

3. Cost of diesel per litre, Rs 2.

4. Cost of finance for purchase of trucks, 12 per cent per annum.
5. Each vehicle can run 5 trips (up and down) each day and can run on an average 24 days each month.
6. Drivers will have to be recruited according to the number of trucks to be purchased. In addition, one extra driver for every 5 vehicles will be required for the entire fleet. Each driver will cost Rs 400 per month.
7. An additional transport supervisor would be required at a cost of Rs 1,000 per month.
8. Yet another possibility is to hire sufficient number of trucks (8-tonners only) from a transport company at the rate of Rs 6,000 per month per truck. The transport company bears repair and maintenance costs as well as the vehicle and road tax. The cement company has to bear the cost of drivers, supervisor and other operational costs.

You are required to advise the company on an appropriate choice among the above alternatives, considering also the option of entrusting the job to be transport operators.

SOLUTION

Statement of Operating Costs Under Alternative Means of Transporting Limestone

Details of costs	Purchase of trucks		Hiring of
	10-tonners	8-tonners	8-tonners
1. Repairs and maintenance per month	Rs 2,000	Rs 1,600	—
2. Vehicle and road tax per month	200	200	—
3. Cost of diesel per month (see working note 1)	4,000	3,000	Rs 3,000
4. Depreciation cost per month (see working note 2)	3,500	3,000	
5. Finance cost per month(see working note 3)	2,500	2,000	—
6. Hiring charges per month	—	—	6,000
7. Supervisor's salary	1,000	1,000	1,000
8. Salary of drivers (see working note 5)	9,600	12,000	12,000
9. Total cost per truck per month[total (1) to (6)]	12,200	9,800	9,000
10 Number of trucks needed (see working note 4)	20	25	25
11. Total cost of entire fleet [(9) × (10) + (8) + (7)]	2,54,600	2,58,000	2,38,000
12. Cost per tonne limestone transported	10.618	10.75	9.916

The company is advised to hire 25 (8-tonner) trucks as it would involve the lowest cost per tonne of limestone transported. There is no question of entrusting the job to local transporters as their charges are higher, that is, Rs 12, Rs 12.5 and Rs 13.

Working Notes

	10-tonners	8-tonners
1 Cost of diesel per month Distance to be covered		
per trip (kms)	50	50
(×) Number of trips	5	5
Total distance per day (kms)	250	250
(×) Number of days	24	24
Total distance per month (kms)	6,000	6,000
÷ Km covered per litre of diesel	3	4
Total diesel consumption (litres)	2,000	1,500
× Rate per litre	Rs 2	Rs 2
	4,000	3,000
2 Depreciation cost per month		
Purchase price	Rs 2,50,000	Rs 2,00,000
Less residual value	40,000	20,000
Depreciation cost	2,10,000	1,80,000
÷ Life in months	60	60
Depreciation per month	3,500	3,000
3 Finance cost per year	30,000*	24,000"
Finance cost per month [(3) ÷ 12]	2,500	2,000
4 Number of trucks required (a) Limestone to be		
transported (tonnes)	24,000	24,000
(b) Limestone transported in 24 days(tonnes)	1,200@	960 @@
Number of trucks required (a ÷ b)	20	25
5 Number of drivers (regular)	20	25
Number of drivers (extra)	4	5
Total number of drivers	24	30
× Salary per driver per month	Rs 400	Rs 400
Total salary bill	9,600	12,000

*(Rs 2,50,000 × 0.12), ** (Rs 2,00,000 × 0.12) @(5 × 10 × 24), @@ (5 × 8 × 24)

57. Adinath Ltd. within the food industry mixes 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, abnormal loss and packing department and to record the transactions for the week ended May.

Process I

Input:	
Material A	6,000 kgs at Rs 0.50 per kg
Material B	4,000 kgs at Re 1 per kg
Mixing labour	430 hours at Rs 2 per kg
Normal loss	5 per cent of weight input, disposed of at Rs 0.16 per kg
Output	9,200 kgs

Process II

Input:	
Material C	6,000 kgs at Rs 1 .25 per kg
Material D	4,200 kgs at Rs 0.75 per kg
Flavouring essence	Rs 330
Mixing labour	370 hours at Rs 2 per hour
Normal waste	5 per cent of weight input with no disposal value
Output	18,000 kgs

No work-in-process at the beginning of the week but 1,000 kgs in process at the end of the week and estimated to be only 50 per cent complete so far as labour and overheads were concerned.

Overhead of Rs 3,200 incurred by the two processes to be absorbed on the basis of mixing labour-hours.

SOLUTION

Process I Account

Particulars	*Quantity*	*Amount*	*Particulars*	*Quantity*	*Amount*
To material A	6,000	Rs 3,000	By normal loss	500	Rs 80
To material B	4,000	4,000	By abnormal loss	300	300
To mixing labour (430 hour @ Rs 2 per hour)		860	By transfer to process II @ Re 1 per kg	9,200	9,200
To overhead (@ Rs 4 per hour)		1,720			
	10,000	9,580		10,000	9,580

Process II Account

To Process 1	9,200	Rs 9,200	By normal waste	1,000	
To material C	6,600	8,250	By work-in-process	1,000	Rs 1,160
To material D	4,200	3,150	By packing department	18,000	21,960
To flavouring essence		300			
To mixing labour		740			
To overhead		1,480			
	20,000	23,120		20,000	23,120

Abnormal Loss Account

To process A/c	300	Rs 300	By sale	300	Rs 48
			By balance to P/L A/c		252
	300	300		300	300

Packing Department Account

To Process II	18,000	Rs 21,960	By balance c/d	Rs 21,960	
		21,960		21,960	

Working Notes

(i) *Statement of Equivalent Production (Process II)*

Input	Particulars	*Units completed or otherwise*	*Stage of completion*		*Equivalent units produced*	
			Material	*Conversion cost*	*Material*	*Conversion cost*
9,200 kgs (output from process I) + 10,800 kgs introduced during process II	Kgs output completed	18,000	100	100	18,000	18,000
	Normal loss (0.05 × 20,000 kgs)	1,000	—	—	—	—
	Work-in-process	1,000	100	50	1,000	500
20,000		20,000			19,000	18,500

(ii) *Statement of Cost*

Particulars	Total cost	*Equivalent production (kg)*	Cost per unit/kg
Materials transferred from Process 1	Rs 9,200		
Add current process costs:			
Material C	8,250		
Material D	3,150		
Flavouring essence	300		
Total material cost	20,900	19,000	Rs 1.10
Conversion cost			
Mixing labour	740		
Overhead	1,480		
	2,220	18,500	0.12

(iii) *Statement of Apportionment of Cost*

Particulars Element of cost	*Equivalent production*	*Cost per kg Cost*	*Total*
Finished input Material	18,000	Rs 1.10 Rs 19,800	
Conversion costs	18,000	0.12 2,160	Rs 21,960
Work-in-process Material	1,000	1.10 1,100	
Conversion costs	500	0.12 60	1,160
			23,120

(iv) *Determination of overhead absorption rate* = Rs 3,200 (Total labour-hours (430 + 370) = Rs 4 per labour-hour

(v) *Cost per kg of output* = (Rs 9,580 - Rs 80) 4- 9,500 = Re 1

58. Ajitnath Ltd. producing P also produces a by-product Q which is further processed into a finished product. The joint cost of manufacture is given below: Material, Rs

5,000; Labour, Rs 3,000; and Overheads, Rs 2,000. Subsequent costs are as under:

	P	Q
Material	Rs 3,000	Rs 1,500
Labour	1,400	1,000
Overheads	600	500
	5,000	3,000

Selling prices are: P, Rs 16,000; Q, Rs 8,000.

Estimated profits on selling prices are 25 per cent for P and 20 per cent for Q.

Assume that selling and distribution expenses are in proportion of sales price.

Show how you would apportion joint costs of manufacture, and prepare a statement showing cost of production of P and Q.

SOLUTION

Apportionment of Joint Costs

Particulars	*P*	Q
Selling price	Rs 16,000	Rs 8,000
Less profits @ 25 per cent (P) and 20 per cent (Q) on selling price	4,000	1,600
Less selling and distribution expenses (2:1)	267	133
Cost of production	11,733	6,267
Less separable costs subsequent to split-off point	5,000	3,000
Share of joint costs (6,733: 3,267 for P and Q)	6,733	3,267

Statement Showing Cost of Production of P and Q

Elements	*Joint costs*		Separable costs		*Total cost*	
of cost	*P*	O	*P*	Q	*P*	O
Materials	Rs 3,367	Rs 1,633	Rs 3,000	Rs 1,500	Rs 6,367	Rs 3,133
Labour	2,020	980	1,400	1,000	3,420	1,980
Overheads	1,346	654	600	500	1,946	1,154
	6,733	3,267	5,000	3,000	11,733	6,267

Working Notes

Determination of Selling and Distribution Expenses

Sales revenue (P and Q)		Rs 24,000
Less profit (P and Q)		5,600
Cost of sales		18,400
Less cost of production		
Joint costs	Rs 10,000	
Separable costs [Rs 5,000 (P) + Rs 3,000 (Q)]	8,000	18,000
Selling and distribution expenses		400

59. Ramdev Ltd. manufactures product A which yields two by-products, B and C. In a period the amount spent upto the point of separation was Rs 20,600. Subsequent expenses were:

	A	*B*	*C*
Materials	Rs 300	Rs 200	Rs 250
Direct wages	400	300	200
Overhead	300	270	180
	1,000	770	630

Gross sales value of products A, B and C was Rs 15,000, Rs 10,000, and Rs 5,000 respectively. It was estimated that the net profit as a percentage of sales in case of products B and C would be 25 per cent and 20 per cent respectively. Ascertain the profit earned on A.

SOLUTION

Statement Showing the Allocation of Joint Costs Between Products B and C (NRV less normal profit method)

Products	*Sales value*	*Profit*	*Separable costs*	*NRV/Joint costs*
B	Rs 10,000	Rs 2,500	Rs 770	Rs 6,730
C	5,000	1,000	630	3,370

Joint cost to be allocated to A would be: Rs 20,600 - (Rs 6,730 + Rs 3,370) = Rs 10,500

Statement Showing Profit Earned by Product A

Sales revenue			Rs 15,000
Less cost *of production*			
Joint cost		Rs 10,500	
Separable costs:			
Material	Rs 300		
Direct wages	400		
Overheads	300	1 ,000	11,500
Profit			3,500

60. The Bakeri Ltd. has two cost centres: (i) Cooking and (ii) Mix-pack. Material is added at the beginning of production in each cost centre, and labour is added equally during production in each cost centre. The FIFO method is used in the Cooking department and the weighted average method in the Mix-pack department. The following information is available for the month of January:

	Cooking	*Mix-Pack*
Work-in-process opening, January 1		
Materials	Rs 4,980	Rs 570
Labour	500	300
Overhead	400	240
Prior department cost	—	2,130
Current month's cost		
Materials	1,98,000	76,380
Labour	50,250	80,000
Overhead	40,200	64,000

Inventory and production records show that Cooking had 500 litres, 40 per cent processed in the beginning of the month and 400 litres, 50 per cent processed at the end of the month; Mix-pack had 300 litres, 50 per cent processed in the beginning of the month and 400 litres, 30 per cent processed at the end of the month.

Production reports for the month show that 'Cooking' started 20,000 litres into production and completed and transferred 20,100 litres to Mix-pack; Mix-pack completed and transferred 20,000 one-litre containers of the finished .product to the warehouse.

You are required to prepare a process cost report for the Cooking department as well as for Mix-pack department. Also prepare relevant process accounts.

SOLUTION

Production Cost Report of Cooking Centre for the Month of January (FIFO Basis)

1. *Units schedule*			
Opening inventory (40 per cent)			500
Add introduced during the month			20,000
Total			20,500
Less closing work-in-process inventory (50 per cent)			400
Units completed and transferred			20,100
2. *Cost to be accounted for*			
Opening inventory (Rs 4,980 + Rs 500 + Rs 400)			Rs 5,880
Materials			1,98,000
Conversion costs:			
Labour	Rs 50,250		
Overhead	40,200		90,450
			2,94,330

3. *Equivalent units and unit cost*

	Material	*Conversion cost*
Opening inventory	Nil	300
Units introduced and completed(20,000 - 400)	19,600	19,600
Closing inventory	400	200
Equivalent units produced	20,000	20,100
Costs	Rs 1,98,000	Rs 90,450
Cost per unit	9.90	4.50

4. *Accounting for total costs transferred to Mix-pack*			
Opening inventory	Rs 5,880		
Costs to complete (300 × Rs 4.50)	1,350		Rs 7,230
Started and completed 19,600 × (Rs 9.90 + Rs 4.50)			2,82,240
Closing work-in-process inventory			
Materials (400 × Rs 9.90)	3,960		
Conversion costs (200 × Rs 4.50)	900		4,860
Total costs accounted for			2,94,330

Cooking Process Account

Particulars	*Unit (litres)*	*Amount*	*Particulars*	*Unit (litres)*	*Amount* Rs
To opening	500	Rs 5,880	By Mix-pack	20,100	2,89,470
inventory	20,000	1,98,000	By closing work-in-	400	4,860
To material		50,250	process		
To labour		40,200			
To overheads					
	20,500	2,94,330		20,500	2,94,330

Cost of Production Report of Mix-pack Department for the Month of January (Weighted Average Cost Basis)

1. *Units schedule*

Opening inventory (50 per cent)	300
Add units transferred from Cooking centre	20,100
Total	20,400
Less closing work-in-process inventory	400
Units completed and transferred	20,000

2. *Cost to be accounted for*

	Cooking centre	*Mix-pack*		*Total costs*
		Material	*Conversion cost*	
Opening inventory	Rs 2,130	Rs 570	Rs 540	Rs 3,240
Current period costs	2,89,470	76,380	1 ,44,000	5,09,850
	2,91,600	76,950	1 ,44,540	5,13,090

3. *Equivalent units and unit cost*

	Cooking centre	*Mix-pack*	
		Material	*Conversion costs*
Units completed	20,000	20,000	20,000
Plus closing work-in-process	400	400	120
	20,400	20,400	20,120
Cost per equivalent unit	Rs 14.2941	Rs 3.772	Rs 7.184

4. *Accounting for total costs*

Transferred to finished goods inventory [20,000 × Rs 25.2501 (Rs 14.2941 + Rs 3.772 + Rs 7.184)]		Rs 5,05,002
Work-in-process (closing)		
Cooking centre (400 × Rs 14.294)	Rs 5,717.60	
Material (400 × Rs 3.772)	1,508.80	
Conversion costs (120 × Rs 7.184)	862.08	8,088.48
Total costs accounted for		5,13,090.48

Mix-pack Process Account

Particulars	*Unit (litres)*	*Amount*	*Particulars*	*Unit (litres)*	*Amount*
To opening work-in-process inventory	300	Rs 3,240	By finished goods inventory account (transferred to)	20,000	Rs 5,05,002
To cooking process A/c (transferred from)	20,100	2,89,470	By work-in-process	400	8,088
To materials		76,380			
To labour		80,000			
To overheads		64,000			
	20,400	5,13,090		20,400	5,13,090

61. In Swastik Ltd. Product B passes through two processes before it is completed and transferred to finished stock. The following data are available for the month of March of the current year:

	Process I	*Process II*
Opening stock (at prime cost)	Rs 5,000	Rs 8,000
Direct materials	40,000	12,000
Direct labour	35,000	40,000
Production overheads	20,000	24,000
Closing stock (at prime cost)	10,000	4,000

Output of processes are transferred to the next ones at the following transfer prices:

Process I—@ 25 per cent on the transfer price to Process I

Process II—@ 25 per cent on the transfer price to finished stock.

Finished stocks are valued at the price at which they are received from Process II, and are as follows: Opening stock, Rs 20,000; Closing stock, Rs 30,000. Sales for the month amounted to Rs 3,00,000. Provision for internal process profits as on March 1 were as follows:

Included in work-in-prooess of Process II, Rs 1,500; Included in finished stock, Rs 6,500 Calculate: (a) Process costs, (b) Gross profit, and (c) Write up the provision for inter-process profit account.

SOLUTION

(a) *Process I Account*

Particulars	*Total*	Cost	*Profit*	*Particulars*	*Total*	*Cost*	*Profit*
To opening stock	Rs 5,000	Rs 5,000		— By Process III			
To direct materials	40,000	40,000		— (output transferred			
To direct labour	35,000	35,000		— at 1331 1/3% of cost			
Less closing stock	(10,000)	(10,000)		— (Rs 90,000 ×			

Prime cost	70,000	70,000	—	133 1/3%)	Rs 1,20,000	Rs 90,000	Rs 30,000
To factory overheads	20,000	20,000					
Process costs	90,000	90,000					
To profit and loss A/c (profit at 25% on transfer price or 33 1/3% on cost)	30,000	—	30,000				
	1,20,000	90,000	30,000		1,20,000	90,000	30,000

Process II Account

To opening stock	8,000	6,500	1,500	By finished stock A/c (output transferred)	2,50,000	1,69,200	80,800
To Process I (transferred from)	1,20,000	90,000	30,000				
To direct materials	12,000	12,000	—				
To direct labour	40,000	40,000	—				
Less closing stock[@]	(4,000)	(3,300)	(700)				
Prime cost	1,76,000	1,45,200	30,800				
To factory overheads	24,000	24,000	—				
Process cost	2,00,000	1,69,200	30,800				
To profit and loss A/c (profit at 20% on transfer price or 25% on cost)	50,000		50,000				
	2,50,000	1,69,200	80,800		2,50,000	1,69,200	80,800

[@]Cost of closing stock is worked out proportionately: (Rs 1,48,500 × Rs 4,000) ÷ Rs 1,80,000 = Rs 3,300 Profit = Rs 4,000 - Rs 3,300, cost = Rs 700

[@]Cost of closing stock = (Rs 1,82,700 × Rs 30,000) ÷ Rs 2,70,000 = Rs 20,300

Process 1		Rs 30,000
Process II	Rs 50,000	
Adjustment of provision for unrealised profit		
Add on opening stock	1,500	
Less on closing stock	(700)	50,800
Finished stock account	60,000	
Adjustment of provision for unrealised profit		
Add on opening stock	6,500	
Less on closing stock	(9,700)	56,800
		1,37,600

62. From the following information, find the profit made by each product apportioning

joint costs on sales-value basis in Super Ltd.:

Joint costs		
Direct material		Rs 1,26,000
Power		25,000
Petrol, oil, lubricants		5,000
Labour		7,500
Other charges		4,100
		1 ,67,600
	Product X	*Product Y*
Selling costs	Rs 20,000	Rs 80,000
Sales	1 ,52,000	1 ,68,000

SOLUTION

Statement Showing Profit After Apportionment of Joint Costs

Particulars	*Product X*	*Product Y*	*Total*
Sales	Rs 1,52,000	Rs 1,68,000	Rs 3,20,000
Less cost of production (In the ratio of sales: 19:21)			
Direct material	59,850	66,150	1,26,000
Power	11,875	13,125	25,000
Petrol, oil, lubricants	2,375	2,625	5,000
Labour	3,562.50	3,937.50	7,500
Other charges	1,947.50	2,152.50	4,100
Gross profit	72,390	$0,010	1,52,400
Less selling costs	20,000	80,000	1,00,000
Profit	52,390	10	52,400

63. Parswanath Ltd. buys a particular raw material at Rs 4 per litre. At the end of the processing in department 1, this raw material splits-off into products, *X,* Y and Z. Product X is sold at the split-off point, with no further processing. Products Y and Z require further processing before they can be sold. Product Y is processed in department 2, and product Z is processed in department 3. Following is a summary of costs and other related data for the end of the current year.

	Department		
	1	2	3
Cost of raw material	Rs 2,40,000	—	—
Direct labour	35,000	Rs 2,25,000	Rs 3,25^)00
Manufacturing overhead	24,000	1,05,000	2,25,0^0
	Products		
	X	Y	Z
Litres sold	10,000	15,000	22,500
Closing inventory	5,000	—	7,500
Sales	Rs 1,50,000	Rs 4,80,000	Rs 7,50,000
Sale price per litre	15	32	25

There were no opening and closing inventories of basic raw materials at the beginning as well as at the end of the year. All finished goods inventory of litres was

complete as to processing. The company uses the relative sales value method of allocating joint costs.

You are required to prepare: (i) Schedule showing the allocation of joint cost; (ii) Cost of sales of each product, the cost of each ending inventory; and (iii) A comparative statement of profit.

SOLUTION

(i) *Schedule Showing Allocation of Joint Cost*

Product	*Output (litres)*	*Market price*	*Total market price*	*Separable costs*	*Net realisable value*	Joint cost	*Total cost*	*Cost per unit*
X	15,000	Rs 15	Rs 2,25,000	—	Rs 2,25,000	Rs 1,17,000	Rs 1;17,000	Rs 7.8
Y	15,000	32	4,80,000	Rs 3,30,000	1,50,000	78,000	4,08,000	27.2
Z	30,000	25	7,50,000	5,50,000	2,00,000	1 ,04,000	6,54,000	21.8
				8,80,000		2,99,000	11,79,000	

Joint cost = [Rs 2,40,000 + Rs 35,000 + Rs 24,000] = Rs 2,99,000 of Department 1 allocated in the ratio of 9:6:8

among products X, Y, and Z respectively.

(iii) *Schedule Showing Cost of Sales and Ending Inventory of Each Product*

Product	*Cost per unit*	*Units sold (litres)*	*Cost of sales*	*Inventory units (litres)*	*Inventory cost*
X	RsT8	Rs 10,000	Rs 78,000	5,000	Rs 39,000
Y	27.2	15,000	4,08,000	—	—
Z	21.8	22,500	4,90,500	7,500	1,63,500

(iii) *Comparative Statement of Profit*

Particulars	Product X	*Product Y*	*Product Z*
(a) Sales revenue	Rs 1,50,000	Rs 4,80,000	Rs 5,62,500
Less cost of sales			
Production cost			
(i) Joint cost	1,17,000	78,000	1 ,04,000
(ii) Separable cost	—	3,30,000	5,50,000
Total cost	1,17,000	4,08,000	6,54,000
Less closing inventory	39,000	—	1,63,500
(b) Cost of goods sold	78,000	4,08,000	4,90,500
(c) Gross profit [(a) - (b)]	72,000	72,000	72,000

64. Rajput Ltd. furnishes you the following information relating to process B for the month of October:

1. Opening work-in-process, Nil
2. Units introduced, 10,000 units @ Rs 3 per unit
3. *Expenses debited to the process*

   Direct materials, Rs 14,650

   Labour, Rs 21,148

   Overheads, Rs 42,000
4. Normal loss in process, 1 per cent of input
5. Closing work-in-process, 350 units

   Degree of completion

   Material, 100 per cent

   Labour and overheads, 50 per cent
6. Finished output, 9,500 units
7. Degree of completion of abnormal loss:

   Material, 100 per cent

   Labour and overheads, 80 per cent
8. Units scrapped as normal loss were sold at Rs 1 per unit.
9. All the units of abnormal loss were sold at Rs 2.50 per unit.

Prepare: (a) Statement of equivalent production, (b) Statement of cost, (c) Process B account, and (d) Abnormal loss account.

SOLUTION

(a) *Statement of Equivalent Production in Process B*

Input	*Particulars*	*Units completed or otherwise*	*Stage of completion (per cent)*		*Equivalent units*	
			Material	*Conversion cost*	*Material*	*Conversion cost*
10,000	Units introduced					
	Units produced	9,500	100	100	9,500	9,500
	Normal loss (10,000 × 0.01)	100				
	Abnormal loss (150 units -100 normal)	50	100	80	50	40
	Work-in-process	350	100	50	350	175
10,000		10,000			9,900	9,715

(b) *Statement of Cost*

Particulars	Total cost	*Equivalent production in units*	*Cost per unit*
Cost of units introduced	Rs 30,000		
Additional direct materials	14,650		
	44,650		
Less sale proceeds of normal loss units (100 units × Rs 1)	100		
Total material cost	44,550	9,900	Rs 4.5
Conversion costs			
Direct labour	21,148		
Overheads	42,000		
Total conversion costs	63,148	9,715	6.5
Total cost	1,07,698		11.00
Value of work-in-process			
Material (350 units × Rs 4.50)		Rs 1,575.00	
Conversion costs (175 units × Rs 6.50)		1,137.50	
		2,712.50	
Value of abnormal loss			
Materials (50 units × Rs 4.50)		225	
Conversion costs (40 units × Rs 6.50)		260	
		485	

(c) *Process B Account*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To materials	10,000	Rs 30,000	By normal loss	100	Rs 100
To direct materials		14,650	By abnormal loss	50 485	
To labour		21,148	By finished stock		
To overheads		42,000	@ Rs 11 per unit	9,500	1,04,500
			By work-in-process inventory	350	2,713
	10,000	1,07,798		10,000	1,07,798

(d) *Abnormal Loss Account*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To process B	50	Rs 485	By sales	50	Rs 125
			By costing profit and loss A/c	—	360
	50	485		50	485

65. Dadima Ltd. undertook a contract for Rs 5,00,000 on July 1, year 1. On June 30, year 2, when accounts were

closed, the following details about the contract were gathered:

Materials purchases	Rs 1,00,000
Wages paid	45,000
General expenses	10,000
Plant purchased	50,000
Materials on hand (June 30, year 2)	25,000
Wages accrued (June 30, year 2)	5,000
Work certified	2,00,000
Cash received	1,50,000
Work uncertified	15,000
Depreciation of plant	5,000

The above contract contained an escalation clause which read as follows:

In the event of prices of materials and rates of wages increasing by more than 5 per cent, the contract price will be increased accordingly by 25 per cent of the rise in the cost of materials and wages beyond 5 per cent in each case.

It was found that since the date of signing the agreement, the prices of the materials and wage rates increased by 25 per cent. The value of the work certified does not take into account the effect of the above clause.

Prepare the contract account. Workings should form part of the answer.

SOLUTION

Contract Account of Deluxe Ltd. for the Year Ending June 30, Year 2

To materials	Rs 1,00,000	By work-in progress:	
To wages paid and accrued	50,000	Work certified	Rs 2,00,000
(Rs 45,000 + Rs 5,000)		Work uncertified	15,000
To general expenses	10,000	By contract escalation[1]	5,000
To depreciation on plant	5,000	By materials in hand	25,000
To profit and loss a/c[2]	20,000		
To work-in-process reserve	60,000		
	2,45,000		2,45,000

Working Notes

(a) *Contract Escalation Charges*

Total increase		*Upto 5 per cent*	*Beyond 5 per cent*	
1 Materials (Rs 75,000 × 25 /125) =	Rs 15,000	(Rs 75,000 × 5 / 125) =	Rs 3000	Rs 12,000
2 Wages (Rs 50,000 × 25 /125) =	10,000	(Rs 50,000 × 5 / 125) =	2,000	8,000
	25,000		5,000	20,000

Therefore, increase in contract price = 0.25 × Rs 20,000 = Rs 5,000.

(b) Since more than 25 per cent but less than 50 per cent of contract has been completed, one-third of the notional

profit as reduced by proportion of cash received is transferred to P&L A/c: Notional profit × 1/3 × Cash received/Work

certified = Rs 80,000 × 1/3 × (Rs 1,50,000/Rs 2,00,000) = Rs 20,000

66. In Ratnam Ltd., a product passes through two consecutive processes having relative standard output of 80 per cent and 90 per cent of inputs. In addition, standard yield is obtained by giving scrap allowances of 10 per cent and 5 per cent of outputs of process 1 and II respectively. Scraps of each process are sold at Rs 1,000 per tonne.

There was no work-in-process at any stage, all materials were issued in process I as follows and all scraps arising from the processes were sold, except closing stock of 10 tonnes (opening stock was nil).

Material issued: 'A'; 100 tonnes @ Rs 2,000 per tonne; 'B'; 400 tonnes @ Rs 1,500 per tonne; and 'C'; 500 tonnes @ Rs 1,200 per tonne.

The actual outputs and scraps were 85-per cent and 8 per cent in process I and 80 per cent and 10 per cent in process II. Assume that there was no price variance.

You are required to find out the standard cost and actual cost per tonne of a product.

SOLUTION

(a) *Value of Materials Used*

Type of materials	*Quantity (tonnes)*	*Rate*	Amount
A	100	Rs 2,000	Rs 2,00,000
B	400	1,500	6,00,000
C	500	1,200	6,00,000
	1,000		14,00,000

(b) *Statement of Production-Standard and Actual*

Particulars	Standard		Actual	
	Percentage	*Quantity (tonnes)*	*Percentage*	*Quantity (tonnes)*
(i) Process I				
Input in process I	100	1,000	100	1,000
Output of process I	80	800	85	850
Less scrap	10	80	8	68
Finished output of process transferred to process II		720		782
(ii) Process II				
Inputs to process II	100	720	100	782
Output of process II	90	648	80	625.60
Less scrap	5	32.40	10	62.56
Finished output (yield) of process II		615.60		563.04

(c) *Cost of Finished Product Per Tonne*

	Standard	Actual
Value of materials used	Rs 14,00,000	Rs 14,00,000
Less *scrap sale value*		
Standard: (102.4 tonnes @ Rs 1,000)		
Less closing stock of 1 0 tonnes @ Rs 1 ,000	10,000	
102.4 tonnes sold @ Rs 1,000 per tonne	1,02,400**	
Actual: (120.56 tonnes@ Rs 1,000)		
Less closing stock of 10 tonnes @ Rs 1,000		10,000
120.56 tonnes sold @ 1,000 per tonne		1,20,560***
Net cost	12,87,600	12,69,440
Finished output in tonnes	615.60	563.04
Cost of finished output per tonne	2,092	2,255

(Process I 80 tonnes + Process II 32.4 tonnes-closing stock 10 tonnes) = 1,02,400

(Process I 68 tonnes + Process II 62.56 tonnes-closing stock 10 tonnes) = 1,20,560

67. Sonata Ltd. makes three products from one common input. Process I is the joint process and every 100 kgs of input yields: 60 kgs of product A; 30 kgs of product B; and 5 kgs of product C and the remaining 5 kgs is a waste product with no market

value.

Product A requires further processing in process II at an average cost of Rs 10 per kg. It is then sold at Rs 100 per kg. Product B is sold at split-off point at Rs 50 per kg. Product C after further processing in process III (at Rs 2.5 per kg), is sold at Rs 5 per kg. The selling expenses associated with C are negligible, and the company desires the cost of product C to be such as to earn a profit of 10 per cent on sales.

During the current period, 1,00,000 kgs of input was processed through process I (assume no inventories), and the total operating costs in Process I were Rs 51,85,000.

You are required: (i) To determine the amount of Process I cost assigned to by-product C; (ii) To determine the amount of joint costs to be assigned to A and B using the relative sale's value approach; (iii) To determine the amount of joint costs to be assigned to A and B, using the net realisable value less normal profit approach.

SOLUTION

(i) *Determination of Cost of By-product C*

Sales revenue (Rs 5 × 5,000 kgs, that is, 1,00,000 kgs × 0.5)	Rs 25,000
Less separable costs in Process III (Rs 2.5 × 5,000 kgs)	12,500
Less profit [10 per cent of selling price (0.10 × Rs 25,000)]	2,500
Cost of Process I (joint costs) assigned to product C	10,000

(ii) *Statement Showing Allocation of Joint Cost between Products A and B (Relative Sales Value Approach)*

Product	*Output (kgs)*	Sales price	*Total market value*	*Separable costs*	*NRV*	*Joint cost*
A	60,000	Rs 100	Rs 60,00,000	Rs 6,00,000	Rs 54,00,000	Rs 40,50,000
B	30,000	50	15,00,000	—	15,00,000	11,25,000
			75,00,000		69,00,000	51,75,000

(iii) *Statement Showing the Allocation of Joint Cost Between Products A and B (NRV less Normal Profit Approach)*

Product	*Market value*	*Normal profit*	*Separable cost*	*NRV*	*Joint cost*
A	Rs 60,00,000	Rs 13,80,000	Rs 6,00,000	Rs 40,20,000	Rs 40,20,000
B	15,00,000	3,45,000	—	11,55,000	11,55,000

Normal profit ratio = 100 per cent - (Rs 51,75,000+Rs 6,00,000) -f Rs 75,00,000 = 100 -77 = 23 per cent

68. Sachi Ltd. produces chemicals X and Y from material Z. 10 litres of raw material Z yield 8 litres of X and 2 litres of Y as a result of processing it in department I. Product X requires furhter processing in department II and then is sold at Rs 150 per litre. Product Y is sold at the split-off point for Rs 112.50 per litre. The following additional data are available for the current period.

Department 1	
Inventory (in litres)	100
Percentage completion of conversion costs	50
Cost of material Z added in current period (1,100 litres)	Rs 22,000
Conversion costs in current period	31,500
Department II	
Inventory (in litres)	200
Percentage completion of conversion costs	25
Conversion costs in current period	Rs 52,000
Finished goods inventories	
Product X	100
Product Y	50

Prepare a statement apportioning the joint costs of Department I between Products X and Y using the net realisable value less normal profit method.

SOLUTION

Department I

Total cost (Rs 22,000 + Rs 31 ,500)		Rs 53,500
Less cost of closing inventory (work-in-process):		
Material cost (100 litres × Rs 20)	Rs 2,000	
Conversion cost [100 × 0.50 × Rs 31.500 H- 1,050)]	1,500	3,500
Cost to be allocated between products X and Y		50,000

Working Notes

(i) 1,050 are equivalent units: (1,000, completed units + 100 units, work in process × 0.50 complete),

(ii) Litres produced, 1,000

Product X (0.80 × 1,000) = 800 litres

Product Y (0.20 × 1,000) = 200 litres

Department II (product X)

Equivalent units started and finished (800 litres from Department I - 200 litres, closing inventory)	600
Add closing equivalent units inventory (200 × 0.25)	50
Equivalent units produced	650

Conversion costs Rs 52,000 Cost per equivalent unit (Rs 52,000 ÷ 650) 80

Statement Apportioning Joint Cost of Department I between Products X and Y (NRV Less Normal Profit Method)

Product	*Output (litres)*	*Setting price*	*Total market value*	*Normal profit*	*Separable costs*	*Joint costs*
X	800	Rs 150	Rs 1,20,000	Rs 24,000	Rs 64,000	Rs 32,000
Y	200	112.50	22,500	4,500		18,000

Normal profit rate = 100 -[Rs 50,000 + (Rs 80 × 800)] ÷ Rs 1,42,500 = 100 - 80 = 20 per cent

Separable costs for completed 800 units @ Rs 80 per equivalent unit = (Rs 80 × 800) = Rs 64,000.

69. In Rastogi Ltd., raw material passes through four processes, I, II, III and IV and the output of each processes is the input of the subsequent process. The loss in the four processes, I, II, HI, and IV is 25, 20, 20 and 16.67 per cent of the input respectively. If the end-product of process IV is 40,000 kgs, what is the quantity of raw material required to be fed at the beginning of process I and the cost of the same at Rs 5 per kg?

Find out also the effect of increase or decrease in the material cost of the end-product for every rupee variation in the cost of the raw material.

SOLUTION

Statement Showing Production of Final Output Assuming 100 kgs of Input in Process I

Process	*Input (kgs)*	Loss *(per cent)*	Loss *(kgs)*	*Output (kgs)*
I	100	25	25	*75*
II	75	20	15	60
III	60	20	12	48
IV	48	16.67	8	40

Determination of quantity required and its cost:

(i) Desired final output, 40,000 kgs

(ii) Input-output ratio, 100 : 40

(iii) Quantity required (i) × (ii) = (40,000 × 100) ÷ 40 = 1,00,000 kgs

(iv) Cost per kg of raw material, Rs 5

(v) Total cost (iii) × (iv), = Rs 5 × 1,00,000 = Rs 5,00,000

Effect of increase or decrease in the material cost:

Since material input output ratio is 5:2 (100 : 40), for very change of Re 1 in the cost of raw materials, the corresponding change in the material cost of 1 kg of final product would be Rs 2.50.

70. Axay Ltd. is manufacturing building bricks and fire bricks. Both the products require two processes: Brick-forming and Heat-treating. Time requirements for the two bricks are:

	Building bricks (hours)	*Fire bricks (hours)*
Forming per 100 bricks	3	2
Heat-treatment per 100 bricks	2	5

Total costs of the two departments in one month were: Forming, Rs 21,200; Heat-treatment, Rs 48,800. Production during the month was: Building bricks, 1,30,000; Fire bricks, 70,000. Prepare a statement of manufacturing costs for the two varieties of bricks.

SOLUTION

Statement Showing Manufacturing Cost for Building Bricks and Fire Bricks of a Brick Manufacturing Company

Name of	*Building bricks (1,30,000)*				*Fire bricks (70,000 units)*			
the process	*Time required (hours)*		*Department cost*		*Time required (hours,*		*) Department cost*	
	Per 100	*For 1,30,000*	*Per hour*	*Total cost*	*Per 100*	*For 70,000*	*Per hour*	*Total cost*
Forming	3	3,900	Rs 4	Rs 15,600	2	1,400	Rs 4	Rs 5,600
Heat treatment	2	2,600	8	20,800	5	3,500	8	28,000
		6,500		36,400		4,900		33,600

Determination of Per Hour Rate for Individual Processes:

Process	*Time taken (hours)*	*Cost*	*Per hour rate*
Forming	(3,900 + 1,400) = 5,300	Rs 21,200	Rs 4
Heat treatment	(2,600 + 3,500) = 6,100	48,800	8

71. Navi Ltd. produces one product through two processes and uses process cost accounting. For the current quarter (October - December), the following report has been prepared for department X. You have been further informed that material is added at the beginning of the process.

Department X (process cost report for October-December)

(i) *Unit schedule*

To account for:	
Opening inventory (75 per cent complete)	8,000
Units started	36,000
Total	44,000
Accounted for:	
Transferred to Process II	40,000
Closing inventory (50 per cent complete)	4,000
Total	44,000

(ii) *Costs to be accounted for*

	Material	*Conversion*	*Total*
Opening inventory	Rs 80,220	Rs 49,600	Rs 1,29,820
Current costs	3,81,780	3,49,400	7,31,180
Total	4,62,000	3,99,000	8,61,000

(iii) *Equivalent unit and unit cost computation*

	Material	*Conversion costs*
Transferred to Process II	40,000	40,000
Closing inventory	4,000	2,000
Equivalent units	44,000	42,000
Costs	Rs 4,62,000	Rs 3,99,000
Unit cost	10.50	9.50

(iv) Cost assignment

Transferred to Process II: 40,000 × (Rs 10.50 + Rs 9.50)		Rs 8,00,000
Ending inventory:		
Material (4,000 × Rs 10.50)	Rs 42,000	
Conversion costs (2,000 × Rs 9.50)	19,000	61,000
Total		8,61,000

You have the following information about Department Y. First, you know that labour and conversion costs are incurred continuously throughout the process. Second, Department Y adds some additional material when the work is 50 per cent complete. Finally, the following data are available.

Opening work-in-process

Units: 18,000 (conversion 75 per cent complete)	Rs 3,77,400
Costs: Department X	36,000
Material - Department Y	40,000
Conversion cost in department Y	4,53,400
Current costs added	
Material — Department Y	64,000
Conversion costs - Department Y	1,16,000
Closing work-in-process (8,000 units)(conversion 25 per cent complete)	

You are required to prepare a schedule computing the cost of the units finished during October-December in department Y and the cost of its ending work-in-process inventory. Department Y uses the weighted average cost method. Also prepare process II account.

SOLUTION

Department Y Cost Report (for October - December)

1. *Units schedule*

Beginning work-in-process inventory	18,000
Transferred from Department X	40,000
Total	58,000
Ending work-in-process (25 per cent complete)	8,000
Finished goods inventory (transferred)	50,000

2. *Costs to be accounted for*

	Department X	*Department Y*		*Total costs*
		Material	*Conversion costs*	
Opening inventory costs	Rs 3,77,400	Rs 36,000	Rs 40,000	Rs 4,53,400
Current costs	8,00,000	64,000	1,16,000	9,80,000
Total	11,77,400	1,00,000	1,56,000	14,33,400

3. *Equivalent units and unit cost*

	Department X	*Department Y*	
		Material	*Conversion costs*
Finished	Rs 50,000	Rs 50,000	Rs 50,000
Closing inventory	8,000	—	2,000

	58,000	50,000	52,000	
Cost per unit (2) ÷ (3)	20.30	2	3	25.3

4. *Cost assignment*

Transferred to finished goods (50,000 units × Rs 25.30)		12,65,000
Work-in-process inventory:		
Department X: (8,000 units X Rs 20.30)	Rs 1,62,400	
Department Y: Conversion costs (2,000 × Rs 3)	6,000	1 ,68,400
Total costs accounted		14,33,400

72. The product of Ratnakar Ltd. passes through three distinct processes for completion. From past experience, it is ascertained that normal wastage in each process is as under:

Process	*Wastage (%)*	*Sale value of wastage per unit*
A	2	Rs 0.25
B	4	0.50
C	2.5	0.60

The expenses were as follows:

	Process A	*Process B*	*Process C*
Materials	Rs 12,000	Rs 10,000	Rs 9,000
Direct labour	16,000	5,000	4,900
Manufacturing expenses	2,000	3,400	3,590
Other factory expenses	3,500	2,005	2,004

4,000 units were initially introduced in process at a cost of Rs 13,560. The output of each process was as under: A, 3,850 units; B, 3,600 units; and C, 3,500 units.

Prepare process accounts and also work out the sale price per unit of finished stock so as to realise 20 per cent profit on selling price.

SOLUTION

Process A Account

Particulars	*Units*	*Amount*	Particulars	*Units*	*Amount*
To units introduced	4,000	Rs 13,560	By normal wastage	80	Rs 20
To materials		12,000	By abnormal wastage@	70	840
To direct labour		16,000	Rs 12 per unit		
To manufacturing expenses		2,000	By process B (output		

To other factory expenses		3,500	transferred @ Rs 12 per unit, Rs 47,040 ÷ 3,920, normal output)	3,850	46,200
	4,000	47,060		4,000	47,060

Process B Account

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To process A (transferred from)	3,850	Rs 46,200	By normal wastage	154	Rs 77
To materials		10,000	By abnormal loss @		
To direct labour		5,000	Rs 18 per unit	96	1,728
To manufacturing expenses		3,400	By process C (output	3,600	64,800
To other factory expenses		2,005	transferred @ Rs 18 per unit, Rs 66,528 ÷ 3,696, normal output)		
	3,850	66,605		3,850	66,605

Process C Account

To process B (transferred from)	3,600	Rs 64,800	By normal wastage	90	Rs 54
To materials		9,000	By abnormal loss @ Rs 24 per unit	10	240
To direct labour		4,900	By finished stock	3,500	84,000
To manufacturing expenses		3,590	(output transferred @		
To other factory expenses		2,004	Rs 24 per unit,		
			Rs 84,240 ÷ 3,510 units)		
	3,600	84,294		3,600	84,294

Selling price per unit = Rs 30 (Rs 24 + Rs 6, profit)

73.. Manish Ltd manufactures wall clocks and watches on an assembly-line basis. The April 1 work-in-process inventory consisted of 2,000 watches that were complete as to material and 50 per cent complete as to labour and overheads. Costs in process on April 1 were: Material, Rs 50,000; Conversion, Rs 1,30,000. 20,000 units were started during the month and 19,000 units were completed. The closing inventory was complete as to material and one-third complete as to conversion. Costs placed in process during April were:

Material (20,000 units)	Rs 6,10,000
Labour (10,000 hours)	4,00,000
Variable overheads	25,000
Fixed overheads	9,45,000
	19,80,000

Prepare a cost-of-production report using FIFO process costing.

SOLUTION

Cost of Production Report (FIFO Basis) for the Month of April

(i) *Units schedule*

Opening inventory	2,000
Add introduced during the month	20,000
Total	22,000
Less closing work-in-process inventory	(3,000)
Units completed	19,000

(ii) *Cost to be accounted for*

	Materials	*Conversion costs*	*Total*
Work-in-process opening inventory	—	—	Rs 1,80,000
Current costs	Rs 6,10,000	Rs 13,70,000	19,80,000
Total costs in process	6,10,000	13,70,000	21,60,000
Equivalent units manufactured	÷ 20,000	÷ 19,000	
Cost per equivalent unit	30.50	72.10	5 102.605

(iii) Equivalent units	*Material*	*Conversion cost*
Units completed	19,000	19,000
Plus equivalent units in closing inventory	3,000	1,000
Less equivalent units in opening inventory	2,000	1,000
Equivalent units manufactured	20,000	19,000

(iv) Accounting for total costs

Transferred to finished goods inventory:		
First batch		
Opening inventory	Rs 1,80,000	
Costs to complete (1,000 × Rs 72.105)	72,105	
	2,52,105	
Second batch		
Started and completed (17,000 × Rs 102.605)	17,44,285	Rs 19,96,390
Work-in-process (closing)		
Materials (3,000 × Rs 30.50)	91,500	
Conversion costs (1,000 × Rs 72.105)	72,105	1 ,63,605
Total costs accounted for		21,59,995

74. Dev Ltd is in the food processing industry. In one of its processes, three joint products are manufactured. Traditionally, the company apportions costs incurred upto the joint products' pre-separation point on the basis of weight of output of the product.

You are required to prepare statements for the management to express:

(a) The profit or loss of each product as ascertained, using weight basis of apportioning pre-separation joint cost.

(b) The optimal contribution which could be obtained from the manufacture of these products.

The following process data for December are given. Costs incurred upto separation point are Rs 96,000.

	Product A	Product B	Product C
Cost incurred after separation point	Rs 20,000	Rs 12,000	Rs 8,000
Selling price per tonne:			
Completed product	500	800	600
Estimated, if sold at separation point	250	700	450
Output (tonnes)	100	60	80

The cost of any unused capacity after the separation point should be ignored.

SOLUTION

Comparative Profit and Loss Account for Products, A,B and C

Particulars	Products A	B	C	Total
Sales revenue	Rs 50,000	Rs 48,000	Rs 48,000	Rs 1,46,000
Less cost of production:				
Joint costs (allocated in of proportion output 10:6:8)	40,000	24,000	32,000	96,000
Separable costs	20,000	12,000	8,000	40,000
Profit/floss)	(10,000)	12,000	8,000	10,000

(b) In order to ascertain whether the firm is following a sound policy regarding processing all products beyond the split-off point, we should adopt the incremental analysis which compares incremental revenue from further processing with incremental costs (separable costs) incurred by the firm.

Particulars	Product A	Product B	Product C
(i) Number of units (tonnes)	100	60	80
(ii) Incremental revenue from further processing per unit	Rs 250	Rs 100	Rs 150
(iii) Total incremental revenue (i) × (ii)	25,000	6,000	12,000
(iv) Incremental cost from further processing	20,000	12,000	8,000
(v) Incremental profit/loss [(iii) - (iv)]	5,000	(6,000)	4,000

The incremental analysis suggests that products A and C should be processed further beyond the split-off point as they yield positive contributions. Product B should be sold at split-off point because further processing cost is more than the incremental revenue it fetches. Accordingly, contributions would be maximum and optimal when products A and C are processed further and product B is sold at the split-off point. This is shown in the following statement: Statement Showing Optimal Contribution

Particulars	Product A	Product B	Product C	Total
Sales revenue	Rs 50,000	Rs 42,000	Rs 48,000	Rs 1,40,000
Less variable costs for further processing	20,000	—	8,000	28,000
Contribution	30,000	42,000	40,000	1,12,000
Less joint costs		Not required		96,000
Profit				16,000

75. Cost of Rs 5 for P and Rs 4 for Q per unit before sale. Assuming a net margin of 25 per cent on cost, their sale prices are fixed at Rs 13.75 and Rs 8.75 per unit

respectively. During the period, the joint cost was Rs 88,000 and the outputs were: P, 8,000 units; Q, 6,000 units. Ascertain the joint cost per unit

SOLUTION

Statement for Ascertaining Joint Cost Per Unit

Product	P	0
Output (units)	8,000	6,000
Selling price per unit	Rs 13.75	8.75
Less, profit margin @ 25 per cent on cost or 20 per cent on sales	(2.75) 11	(1.75) 7
Less post split off cost	(5)	(4)
Pre-split off net joint cost per unit	6	3
Share in joint cost of units of P and Q can be obtained by apportioning in ratio of 8:3[1]	64,000	24,000
Joint cost per unit	8@	499

@(Rs 64,000/8000 units) @@(Rs 24,000/6,000 units)

Working Notes

1. Calculation of Ratio of Apportionment of Joint Cost

Products	P	O
Units	8,000	6,000
Pre-split off net joint cost per unit	Rs 6	Rs 3
Total output cost	48,000	18,000
Ratio	8	3

76. Arpit Ltd., commenced a contract on April 1, of the current year. The costing records concerning the said contract reveal the following information on March 31, of the current year:

Materials charged to site	Rs 2,58,100
Labour engaged	5,60,500
Foremen's salary	79,300

Plants costing Rs 2,60,000 had been on site for 146 days. Their working life is estimated at 7 years and their final scrap value at Rs 15,000. A supervisor, who is paid Rs 4,000 per month, has devoted approximately three-fourths of his time to this contract. The administrative and other expenses amount to Rs 1,40,000. Materials in hand at site on March 31, of the current year cost Rs 25,400. Some of the material costing Rs 4,500 was found unsuitable and was sold for Rs 4,000 and a part of the plant costing Rs 5,500 (on March 31 of the current year) unsuited to the contract was sold at a profit of Rs 1,000.

The contract price was Rs 22,00,000 but it was accepted by the.contractor for Rs 20,00,000. On March 31, of the current year, two-thirds of the contract was completed. Architects certificate had been issued covering 50 per cent of the contract price and Rs 7,50,000 so far has been paid on account.

Prepare contract account and state how much profit or loss should have been included in the financial accounts of the current year; workings should be clearly given. Depreciation is charged on time basis.

Also prepare the contractee's account and show how these accounts would appear in the balance sheet as on March 31, of the current year.

SOLUTION

Contract Account from April 1 to March 31, Current If ear

To materials 1	Rs 2,58,100	By materials at site	Rs 25,400
To labour costs	5,60,500	By materials sold	4,000
To foremen's salary	79,300	By P/L A/c (loss on sales	
To depreciation on plant	14,000	of materials	500
To supervisor's salary	27,000	By cost of work done c/d	10,49,000
To administrative and other expenses	1,40,000		
	10,78,900		10,78,900
To cost of work done b/d	10,49,000	By work-in-progress	
To profit c/d	2,13,250	Work certified[3]	10,00,000
		Work uncertified[3]	2,62,250
	12,62,250		12,62,250
To profit and loss A/c[4]	1,06,625	By profit b/d	2,13,250
To work-in-progress reserve A/c	1,06,625		
	2,13,250		2,13,250
To balance c/d	Rs 7,50,000	By bank	Rs 7,50,000

Extracts from Balance Sheet as on March 31, Current Year

Liabilities	*Amount*	*Assets*	*Amount*
Profit and loss A/c[6]	Rs 1,07,125	Plant at site[5]	Rs 2,40,500
		Work-in-progress	
		Work certified	Rs 10,00,000
		Work uncertified	2,62,250
			12,62,250
		Less reserve	1,06,625
			11,55,625
		Less cash received	7,50,000
			4,05,625
		Materials at site	25,400

Working Notes

1. Depreciation on plant =(Rs 2,60,000-Rs 15,000) / 7 years × (146 days / 365 days) = Rs 14,000

2. *Supervisor's salary:* Rs 4,000 × 9 months × 3/4 = Rs 27,000

3. *Work certified and work uncertified: Work certified:* 0.50 × Rs 20,00,000 = Rs 10,00,000. Since the cost of two-third of the contract is Rs 10,49,000, the total estimated cost of completed contract is Rs 15,73,500 (Rs 10,49,000 × 3/2). Accordingly, cost apportioned to 50 per cent of contract = Rs 7,86,750 (0.50 × Rs 15,73,500). Therefore, work uncertified = Total cost incurred till date-Cost apportioned to work certified = Rs 10,49,000 -Rs 7,86,750 = Rs 2,62,250.

4. Rs 2,13,250 × 2/3 × Rs 7,50,000/Rs 10,00,000 = Rs 1,06,625.

5. *Plant Me*

To balance b/d	Rs 2,60,000	By contract a/c (depreciation)	Rs 14,000
To profit and loss A/c(profit on	1,000	By bank (sale consideration)	6,500
sale of plant)		By balance c/d	2,40,500
	2,61,000		2,61,000

6. *Profit and Loss A/c*

To contract a/c	Rs 500	By plant a/c	Rs 1,000
To balance c/d	1,07,125	By contract a/c	1,06,625
	1,07,625		1,07,625

77. The following data relate to process Q, for Navsari Ltd.:

(i)	Opening work-in-process (units)		4,000
	Degree of completion (%):		
	Materials	100	Rs 24,000
	Labour	60	14,400
	Overheads	60	7,200
(ii)	Received during the month of April, current year from process P: 40,000 units		Rs 1,71,000
(iii)	Expenses incurred in process Q during the month:		
	Materials		Rs 79,000
	Labour		1,38,230
	Overheads		69,120
(iv)	Closing work-in-process (units)		3,000
	Degree of completion (%):		
	Materials		100
	Labour and overheads		50
(v)	Units scrapped (units)		4,000
	Degree of completion (%):		
	Materials		100
	Labour and overheads		80
(vi)	Normal loss: 5 per cent of current input.		
(vii)	Spoiled goods realised Rs 1 .50 each on sale.		
(viii)	Completed units are transferred to warehouse.		

Required Prepare: (i) Equivalent units statement, (ii) Statement of cost per equivalent unit and total costs, (iii) Process Q Account, (iv) Any other account necessary.

SOLUTION

(i) Equivalent Units Statement (using FIFO method)

Units introduced	Particulars	Units produced	Equivalent Production					
			Materials		Labour		Overheads	
			Percentage completion	Units	Percentage completion	Units	Percentage complete	Units ion
4,000	Opening work-in-progress units, completed and transferred to warehouse	4,000			40	1,600	40	1,600
40,000	Units introduced, completed and transferred to warehouse	33,000	100	33,000	100	33,000	100	33,000
	Normal loss	2,000	—	—	—	—	—	—
	Closing work-in-progress	3,000	100	3,000	50	1,500	50	1,500
	Abnormal loss	2,000	100	2,000	80	1,600	80	1,600
44,000		44,000		38,000		37,700		37,700

(ii) Statement of Cost

Particulars	Total cost	Equivalent production (in units)	Cost per unit
Materials			
Cost of units introduced	Rs 1,71,000		
Additional direct material	79,000		
	2,50,000		
Less sale proceeds of scrap material (2,000 units × Rs 1 .5)	3,000		
	2,47,000	38,000	Rs 6.50
Direct labour	1,38,230	37,700	3.67
Overheads	69,120	37,700	1.83
	4,54,350		12.00

Statement of Apportionment of Cost

Particulars	Element of cost	Equivalent production	Cost per unit	Cost	Total cost
Opening inventory (combined)	—	—	—	Rs 45,600	—
	Material	—	—	—	—
	Labour	1,600	Rs 3.67	5,872	
	Overheads	1,600	1.83	2,928	Rs 54,400
Finished production	Material	33,000	6.50	2,14,500	
	Labour	33,000	3.67	1,21,110	
	Overheads	33,000	1.83	60,390	3,96,000
Abnormal loss	Material	2,000	6.50	13,000	
	Labour	1,600	3.67	5,872	
	Overheads	1,600	1.83	2,928	21 ,800
Work-in-progress (WIP)	Material	3,000	6.50	19,500	
	Labour	1,500	3.67	5,505	
	Overheads	1,500	1.83	2,745	27,750

(iii) Process Q Account

Particulars	Units	Amount	Particulars	Units	Amount
To opening W.I. P.	4,000	Rs 45,600	By normal loss @ Rs 1.5	2,000	Rs 3,000
To units received from Process P	40,000	1,71,000	By completed units (Rs 54,400 + Rs 3,96,000)	37,000	4,50,400
To expenses incurred					
Material		79,000	By abnormal loss	2,000	21,800
Labour		1,38,230	By closing W.I. P.	3,000	27,750
Overheads		69,120			
	44,000	5,02,950		44,000	5,02,950

Calculated in answer (ii)

(iv) Abnormal Loss Account

Particulars	Units	Amount	Particulars	Units	Amount
To process Q A/c	2,000	Rs 21,800	By sale @ Rs 1 .5	2,000	Rs 3,000
			By transfer to profit and loss a/c		18,800
	2,000	21,800		2,000	21,800

78. In manufacturing the main product, Ram Ltd processes the incidental waste into two products, A and B. From the following data relating to the products, you are required to prepare a comparative profit and loss statement showing the individual costs and other details. The total costs upto separation point were Rs 3,10,400.

	Main product	*By-product A*	*By-product B*
Sales	Rs 8,00,000	Rs 64,000	Rs 96,000
Costs after separation	80,000	12,800	14,400
Estimated net profit (per cent to sales value)		20	30
Estimated selling expenses (as per cent to sales value)	20	10	15

SOLUTION

Statement Showing Allocation of Joint Costs.,

Particulars	By-product A	*By-product B*
Sales	Rs 64,000	Rs 96,000
Less: estimated net profit on sale (20 per cent, A; and 30 per cent, B) estimated selling expenses	12,800	28,800
(10 per cent, A, and 15 per cent, B)	6,400	14,400
separable costs	12,800	14,400
Share of joint costs allocated	32,000	38,400

Share of main products in joint costs, therefore, would be: Rs 3,10,400 - (Rs 32,000 + Rs 38,400) = Rs 2,40,000.

Comparative Profit and Loss Account

Particulars	*Main product*	*By-product A*	*By-product B*
Sales revenue	Rs 8,00,000	Rs 64,000	Rs 96,000
Less cost of production:			
Joints costs	2,40,000	32,000	38,400
Separable costs	80,000	12,800	14,400
Gross profit	4,80,000	19,200	43,200
Less selling expenses	1 ,60,000	6,400	14,400
Net profit	3,20,000	12,800	28,800

79. Alok Ltd. Purchases raw materials worth Rs 11.04 lakh and processes them into four products P, Q, R and S, which have a unit sale price of Rs 3, Rs 9, Rs 16, and Rs 60, respectively at split-off point, as they could be sold as I such to other processors.

However, during year, the company decided to further process and sell products P, Q and S, while product R would be sold at split-off point to other processes. The processing of raw materials into the four products cost Rs 28 lakh to the company. The other data for the year were as under (amount in Rs lakh):

Product	Output (units)	Sales	Additional processing (variable) cost after split-off
P	10,00,000	46.00	12.00
Q	20,000	4.00	2.40
R	10,000	1.60	-
S	18,000	12.00	0.40

You are required to work out the company's annual income If the joint costs are allocated amongst the four products on the basis of 'net ` ealizatio value' at split-off point, what would be the compan's annual income?

SOLUTION

Statement Showing Annual Income for Four Products (Rs in lakh):

1 Products	Sates	Joint cost (working note 1)	Additional processing cost after split-off	Total cost (3+4)	Net income (2-5)
(1)	(2)	(3)	(4)	(5)	(6)
P	46.00	27.20	12.00	39.20	6.80
Q	4.00	1.28	2.40	3.68	0.32
R	1.60	1.28	—	1.28	0.32
S	12.00	9.28	0.40	9.68	2.32
Total	63.60	39.04	14.80	53.84	9.76

Working Note

Statement Showing Allocation of Joint Cost Amongst the Products P, Q, R and S (Under net ` ealizatio values at split-off point method) (Rs in lakh)

Products	Sales value	Less additional processing cost	Wet ` ealization value beyond split-off point	Computation	Joint costs
(D	(2)	(3)	(4)	(5)	(6)
P	46.00	12.00	34.00	$\frac{39.04 \text{ X } 34.00}{48.80}$	27.20
Q	4.00	2.40	1.60	$\frac{39.04 \text{ X } 1.60}{48.80}$	1.28
R	1.60	—	1.60	$\frac{39.04 \text{ X } 1.60}{48.80}$	1.28
S	12.00	0.40	11.60	$\frac{39.04 \text{ X } 11.60}{48.80}$	9.28
Total:	63.60	14.80	48.80		39.04

5.9 EXERCISES :

1. Anuja Ltd. engaged in making non-standard products to customers' specifications processes all production through three departments. The cost figures of the factory for the month of September of the current year are furnished as follows:

Nature of expenses	*Total expenses*	*Departments*		
		A	*B*	C
Direct materials	Rs 18,800	Rs 7,500	Rs 6,400	Rs 4,700
Labour	15,500	6,000	5,000	4,000
Total overhead expenses	7,500	3,000	2,500	2,000
	41,100	16,500	13,900	10,700

Prepare a simple cost sheet for products X and Y on the basis of data furnished below:

Product Cost elements Expenses incurred in department

	A	B	C
X Direct material	Rs 120	Rs 200	Rs 300
Direct labour	55	62	70
Y Direct material	50	90	140
Direct labour	70	60	90

2. Arati Ltd has a job order costing system. The factory expenses incurred in the month of March of the current year (as shown by the factory overhead control account) were as follows:

Cutting shop	Rs 36,350
Finishing shop	7,930
Assembly shop	4,755
Spraying shop	680

Overheads have been debited to jobs as follows:

Cutting — Rs 1.30 per machine-hour for 22,000 hours.

Finishing — Rs 0.76 per direct labour-hour for 11,000 hours.

Assembly — 150 per cent of direct labour cost (Rs 3,200).

Spraying — Rs 0.60 per piece for 935 pieces.

All expenses are charged to a factory overhead control account and are transferred from this account at the end of each month to departmental overhead accounts. During the month, the overhead charge to each job is transferred from the departmental overhead account concerned.

You are required to : (i) Close the factory overhead control account by making the necessary transfer to the departmental overhead accounts by means of a journal entry (ii) To journalise the factory overhead absorbed; and (iii) To state the amount of

overorunder absorption of overheads in each department. Also, where this is considered significant, comment on this position.

3. In Savli Ltd., a product passes through three distinct processes, A and B and is then transferred to the finished stock. The output of A passes to B and that of B to the finished product. From the following information, you are required to prepare process accounts: .

	Process A	Process B
Materials consumed	Rs 24,000	Rs 12,000
Direct labour	28,000	16,000
Manufacturing expenses	8,000	8,000
Input in process A (units)	20,000	
Input in process B	20,000	
Output (units)	18,000	16,600
Normal wastage as per cent of input	5	10
Value of normal wastage per 100 units	15	20

4. Mr Daga furnishes the following data relating to the manufacture of a standard product during the month of April:

Raw materials consumed	Rs 15,000
Direct labour charges	9,000
Machine-hours worked	900
Machine-hour rate	5
Administrative overheads (per cent on works cost)	20
Selling overheads per unit	0.50
Units produced	17,200
Units sold at Rs 4 per unit	16,000

You are required to prepare a cost sheet from the above, showing:

(a) The cost per unit,

(b) Profit pre unit sold and profit for the period.

5. Prem Ltd is manufacturing refrigerators and the following details are furnished in respect of its factory operation for the year ended March 31:

Work-in-process, April 1 at prime cost	Rs 51,000	
Manufacturing expenses	15,000	Rs 66,000
Work-in-process, March 31 at prime cost	45,000	
Manufacturing expenses	9,000	54,000
Stock of raw materials, April 1		2,26,000
Purchase of raw materials		4,77,000
Direct labour		1,71,000
Manufacturing expenses		84,000
Stock of raw materials on March 31		2,04,000

On the basis of the above data, prepare a statement showing the cost of production. Also, indicate separately the amount of manufacturing expenses, which enter into the cost of production.

6. The following particulars are extracted from the works and other relevant sources in respect of Anil Ltd:

1. Estimated materials cost of the job is Rs 50,000 and the direct labour cost is likely to be Rs 10,000.
2. In the machine shop, it will require machining by a German machine for 20 hours and a Japanese machine for 6 hours.
3. The machine-hour rates for the German and Japanese machines are Rs 100 and Rs 150 respectively.
4. The direct wages in all other shops last year amounted to Rs 8,00,000 as against Rs 4,81,000 factory overheads.
5. Last year, the factory cost of all jobs amounted to Rs 25,00,000 against Rs 3,75,000 office expenses. Make out a quotation with 20 per cent profit on the selling price.

7. From the following information, prepare a cost sheet and calculate cost and profit per unit of production for Viraj Ltd.

1. Weight of finished goods: 2,432 kgs
2. Wages: Rs 5,120
3. Units produced: 2,480
4. Factory overhead: 60 per cent of wages
5. Office overhead: 25 per cent of factory cost
6. Cost of raw materials: Rs 4 per kg
7. Wastage of raw materials during processing (actual and normal): 5 per cent
8. Sales: Rs 29,760.

There is no opening and closing stock of either raw materials or work-in-process

8. In Saroj Ltd. the product of a manufacturing unit passes through two distinct processes. From past experience the incidence of wastage is ascertained as under: Process A, 2 per cent; Process B, 10 per cent. In each case the percentage of wastage is computed on the number of units entering the process concerned. The sales realisations of wastage in Process A and B are Rs 25 and Rs 50 per 100 units respectively.

The following information is obtained for the month of April: 40,000 units of crude material were introduced in Process A at a cost of Rs 16,000.

	Process A	Process B
Other materials	Rs 16,000	Rs 5,000
Direct labour	9,000	8,000
Direct expenses	8,200	1,500
Output (units)	39,000	36,500
Finished product stock (units)		
April 1	6,500	5,000
April 30	5,000	8,000
Value of stock per unit on April, 1	1.20	1.60

Stocks are valued and transferred to the subsequent process at weighted average costs. Prepare respective process accounts and stock accounts.

9. Rajat Ltd. undertakes to deliver 100 machine elements to be manufactured out of mild steel at Rs 7.50 per casting; the expenses pertaining to the job are given below:

Material	150 kgs of mild steel at Rs 1.50 per kg
Labour	
Moulding	85 hours at Rs 1 per hour
Core making	40 hours at Rs 0.08 per hour
Finishing	56 hours at Rs 1.25 per hour
Overhead expenses	
Moulding	160 per cent of labour cost
Core making	200 per cent of labour cost
Finishing	120 per cent of labour cost

Cupola cost came to Rs 250 per operation and the input of mild steel in this case was 1,000 kgs; 32 kgs, of the metal is fettled out and the value creditable is Re 1 per kg. Also, 2 kgs were lost in the process of melting and moulding. Actually 105 castings were made, out of which 3 were defective and were rejected on inspection.

The excess castings in good condition were also delivered to the customer at a concessional rate of Rs 6 per casting.

Prepare the job-cost sheet suitably showing all details furnished above.

10. Prabhat Ltd produces goods against orders. Its manufacturing section consists of

three departments, X, Y, and Z. It is the practice of the company to prepare quarterly budgets for the purpose of control and the absorption of overheads. The following information is extracted from the first quarter budget of the company.

	Departments			
	Total	X	Y	Z
1. Material	Rs 60,000	Rs 10,000	Rs 20,000	Rs 30,000
2. Direct labour cost	23,500	7,100	8,000	8,500
3. Variable factory overheads	15,500	5,000	4,500	6,000
4. Fixed factory overheads	15,000	—	—	—
5. Administrative overheads	10,300	—	—	—
6 Machine-hours	20,000	6,500	4,000	10,000

The factory overheads are absorbed on the basis of machine-hours and the administrative overheads are absorbed as a percentage of the factory cost.

The company has received an order from a regular customer for the supply of a specific variety of products that pass through two departments only, X and Y. In respect of the order, the following particulars are available.

	Departments	
	X	Y
Material cost	Rs 1,500	Rs 2,500
Direct labour cost	720	800
Machine-hours	650	440

Prepare a job order cost sheet and ascertain the price of the order if the margin of 25 per cent on sales is added to the total cost of production.

11. Prepare necessary process accounts from the following details for Rashi Ltd.:

	Process A	Process B
1. Materials	Rs 30,000	Rs 3,000
2. Labour	10,000	12,000
3. Overheads	7,000	17,000
4. Input (units)	20,000	1 7,500
5. Normal loss (per cent)	11	4
6. Sales value of wastes per unit	1	2

There was no opening stock or closing stock or work-in-process. Final output from Process 'B' was' 17,000 units.

12. The working results of a section of an industrial organisation engaged in the production and sale of a machine Y for the current year with estimates for the next year are furnished below:

Particulars	Current year	Next year
1. Raw materials	Rs 150	Rs 200
2. Spares and purchased parts	250	300
3. Indirect materials and consumables	120	160
4. Factory power	100	120
5. Direct labour cost	400	440
6. Factory overheads	330	400
Factory cost	1,350	1,620
7. Selling and administrative expenses	350	400
Cost of sales	1,700	2,020
8. Profit per machine	310	380
Selling price	2,000	2,400

Profit on sale of 2,500 machines: Rs 7,50,000 (current year) and Rs 9,50,000 (next year). It is proposed to produce only 2,000 machines next year and sell the same at Rs 2,500 per unit. The statement may be recast taking into consideration the following costs:

(a) Spares and purchased parts would cost Rs 320 per unit next year.

(b) Use of electric generating sets due to power cuts would cost Rs 150 per machine instead of Rs 120.

(c) Lay-off wages, and so on would increase labour costs per machine by Rs 20 more than the estimated amount.

(d) Variable expenses under factory overheads will increase by Rs 10 per machine. This head for both the years includes a sum of Rs 3,70,000 which is fixed.

(e) The apportionment of selling and administrative expenses for this section will be reduced by Rs 1,49,000 for the next year.

13. The product of Nishi Ltd. passes through two processes, A and B, and then to the finished stock. It is ascertained that in each process normally 5 per cent of the total weight is lost and 11 per cent is scrap which from processes A and B realise Rs 80 and Rs 200 respectively.

	Process A	Process B
Material in tonnes	1,000	70
Cost of material per tonne	Rs 125	200
Wages	28,000	10,000
Manufacturing expenses	8,000	5,250
Output in tonnes	830	780

Prepare process accounts showing cost per tonne of each process. There was no stock or work-in-process in any process.

14. The following list contains several transactions and items of Nirupa Ltd. A job order costing system is in use, and the factory is not departmentalised. The manufacturing overhead rate is Rs 6 per direct labour-hour. You are required to pass journal entries for these items:

1. Materials and supplies costing Rs 2,10,000 were purchased on account.
2. Wages totalling Rs 2,00,000 were earned during the month; the accrued pay-roll at the beginning of the month was Rs 22,000 and at the end of the month it was Rs 10,000.
3. Property taxes on the factory plant and equipment of Rs 10,000 were paid during the period.
4. Health insurance costs amounted to Rs 44,000 during the period. Of this amount, 75 per cent was for factory employees and 25 per cent for other personnel.
5. Depreciation on the factory plant and equipment was estimated at Rs 1,20,000 for the month.
6. Materials put into process were as follows:

Job 101	Rs 20,000
Job 102	40,500
Job 103	3,60,000

7. Supplies, Rs 24,000
8. Pay-roll analysis reveals:

Job 101 5,000 hours @ Rs 8	Rs 45,000
Job 102 7,500 hours @ Rs 8	60,000
Job 103 10,000 hours @ Rs 8	80,000
Idle time 600 hours @ Rs 8	4,900
Indirect labour3,800 hours @ Rs 4	15,300

15. In Akash Ltd., a product has to pass through three distinct processes before it is ready for sale. From the information appended below work out the selling price of the product if the management decides to have a mark-up of 25 per cent on its works cost.

Stage of production	I	II	III
Input of raw materials (at Rs 4 per kg) [kgs]	1 ,00,000		
Normal loss on input at each stage (per cent)	5	5	5
Delivered to next process (kgs)	90,000	80,000	
Total direct labour cost (Rs)	14,000	15,000	30,000
Variable overheads (per cent on direct labour)	150	120	100
Fixed overheads (per cent on direct labour)	260	140	200
Finished stocks held back at the stage (kgs)	4,000	4,000	—

For the purpose of this exercise, abnormal loss, if any, may be charged to the respective

stages since output of each stage can also be diverted to other processes for manufacturing of other chemicals.

4. From the following data of Kali Ltd., prepare process account for a single product:

		Process 1	Process II
1	Period: December of the current year		
2	Work-in-process at the beginning	Nil	Nil
3	Cost incurred in the period		
	Direct materials	Rs 60,000	—
	Labour	12,000	Rs 16,000
	Factory overheads	24,000	20,000
4	Units of production		
	Received in process	40,000	36,000
	Completed and transferred	36,000	32,000
	Remaining in process at the end of period	2,000	2,500
	Loss in process (normal loss)	2,050	1 ,500
5	Production remaining in process should be valued at (per cent)		
	Materials	100	
	Labour and overhead	50	

16. The following details have been obtained from the cost records of Navin Ltd. for the month of September:

Stock of raw materials as on September 1	Rs 75,000
Stock of raw materials as on September 30	91,500
Direct wages	52,500
Indirect wages	2,750
Sales	2,11,000
Work in process on September 1	28,000
Work-in-process on September 30	35,000
Purchase of raw materials	65,000
Factory rent, rates and power	15,000
Depreciation of plant and machinery	3,500
Expenses on purchases	1,500
Carriage outwards	2,500
Advertising	3,500
Office rent and taxes	2,500
Traveller's wages and commission	6,500
Stock of finished goods on September 1	54,000
Stock of finished goods on September 30	31,000

Prepare a production account giving the maximum possible break-up of costs and profits for the month of September.

17. From the following particulars, make out a monthly cost sheet of Delux Ltd

Coal used	5,000 tonnes, Rs 12.50 per tonne
Coke produced and sold	3,505 tonnes, selling price Rs 24 per tonne
Tar produced	200 tonnes, Rs 48 per tonne
Sulphur, etc.	50 tonnes, Rs 180 per tonne
Benzol, etc.	48 tonnes @ Rs 75 per tonne
Raw materials used	Rs 3,900
Wages paid	9,600
Repairs and renewals	9,100
Salary and general charges	5,000

Show the percentage of coke produced to the weight of coal used.

18. The following information has been extracted from the records of Nagraj Ltd. engaged in the manufacture of a single product.

Opening work-in-process	Quantity (units)	16,000
	Material	Rs 1,48,000
	Wages	34,000
	Overhead	29,000
Added during the year	Quantity (units)	69,000
	Material	Rs 5,62,000
	Labour	1 ,67,000
	Overhead	1,51,000
Finished during the year	Quantity (units)	56,000
Closing work-in-process	Quantity (units)	25,000
	Material	complete
	Labour	1/3 complete
	Overhead	1/3 complete

Tabulate production and cost figures to give quantities, value units, values and total for completed output and value of each element of cost for closing work-in-progress. Average method of valuation may be used.

19. Alkali Ltd. uses a job cost system. At the beginning of the month of January, two orders were in process, as follows:

	Order 100	Order 101
Raw materials	Rs 1,000	Rs 900
Direct labour	1,240	250
Manufacturing overhead absorbed	1,860	300

There was no inventory of finished goods on January 1. During the month of January, Orders 102 to 115 inclusive, were put into process.

Raw materials requirements amounted to Rs 13,500, direct labour expenses for the month were Rs 20,000 and actual manufacturing overhead recorded during the month amounted to Rs 28,000.

The only order in process at the end of January was Order 115 and the costs incurred for this Order were Rs 1,150 of raw materials and Rs 1,000 of direct labour. In addition, Order 113 which was 120 per cent complete, was still on hand as on January 31. Total costs allocated to this order were Rs 3,500. The firm's overhead allocation rate in January was the same as that used in December and is based on labour cost.

Prepare journal entries, with supporting calculations to record the cost of goods manufactured, the cost of goods sold, and the closing of the over or under-absorbed manufacturing overheads to costing profit and loss account.

20. Arbuda Ltd., having undertaken construction work at a contract price of Rs 5,00,000 begins the execution of the work on January 1. The following are the particulars of the contract upto December 31:

Machinery installed at site	Rs 30,000
Materials sent to site	1,70,998
Wages paid at site	1,48,850
Direct expenses	6,324
Overhead charges allocated	8,252
Materials returned from site	1,098
Work certified by architect	3,92,000
Cash received	3,60,000
Cost of work not yet certified	9,200
Materials in hand as on December 31	3,786
Wages accrued due on December 31	5,380
Value of machinery as on December 31	22,000

Prepare the contract account.

21. Viral Ltd produces article 'B' from a material which passes through two processes namely, P and Q. The details relating to the month are as under:

	Process P	Process Q
Materials introduced (units)	10,000	
Transferred to next process (units)	9,000	
Work-in-process (WIP):		
At the beginning of month (units)	—	600
At the end of the month (units)	1,000	400
Expenses:		
Work-in-process at the beginning of the month	—	Rs 9,400
Materials introduced at the beginning of the process	Rs 1,20,000	
Labour and overheads	27,700	18,200

Stage of completion of work-in-process:

Process P: Closing WIP, 20 per cent complete in respect of labour and overheads. Process Q: Opening WIP 33 1/3 per cent complete in respect of labour and overheads.

Closing WIP 25 per cent complete in respect of labour and overheads.

The finished output B emerging out of process Q is sold at Rs 20 per unit.

The management is considering an alternative by which the finished output B could further be treated by installing a new machine at a capital cost of Rs 8,00,000. The final product known as article N produced by this operation could be sold at Rs 25 per unit. The operating expenses of the aforesaid further treatment are estimate at Rs 23,000. The company desires a return on investment of 25 per cent.

1. Process cost accounts for processes P and Q. (Show the workings of equivalent units and cost per equivalent unit in each process).

2. A statement of profitability of product B as it emerges from process Q, and

3. Advise the management whether treatment of product 'B' by installing the new machine should be taken up or not.

22. In Kesav Ltd. Product A passes through three processes. In January, the following information is obtained in respect of process 2:

Opening stock: 2,800 units valued at Rs 1,200 made up of Rs 700 for material, Rs 150 for

labour, Rs 350 for overheads.

Transfer from process 1:14,000 units @ Rs 0.20 each

Transfer to process 3: 12,000 units

Direct material added in process 2	Rs 1,560
Direct labour amounted to	2,000
Production overhead incurred	4,400

Units scrapped: 2,000 on completion of process 2

Closing stock: 2,800 units

Degree of completion (per cent): Material 80

Labour 60

Overheads 60

10 per cent loss during production considered normal loss.

Units scrapped realised Rs 0.40 each.

Prepare a statement of the cost of process 2 and show the units transferred to process 3, applying the average cost method.

23. A building contractor took a contract for the construction of a certain building on January 31. The agreed contract price was Rs 16,00,000. The contractor had made the following expenditure during the year:

Direct materials purchased	Rs 40,000
Materials issued from stores	65,000
Direct labour	65,000
Plant	1,67,000
Direct expenses	40,000

From the following information prepare a contract account for the year. Also show the amount of work-in-process which will be shown in the balance-sheet of the contractor:

Value of plant on December 31	Rs 1,20,000
Stock of materials at site on December 31	20,000
Materials returned to stores	4,500
Work certified by the architects	3,00,000
Cash received from contractee	2,80,000
Cost of work not yet certified	16,000

24. Garvi Ltd gives the following particulars relating to Process A in its plant for the month of December pertaining to current year.

Work-in-progress (opening balance) on December	1-500 units:	Material	Rs 4,800
		Labour	3,200
		Overheads	6,400
			14,400
Units introduced during the month			19,500
Processing costs incurred during the month:			
Materials	Rs 1 ,86,200		
Labour	72,000		
Overheads	1 ,06,400		Rs 3,64,600
Output: Units transferred to process B			18,200
Units scrapped (completely processed)			1,400
Work-in-process (closing balance)			400
[Degree of completion (%): Materials 100			
Labour and overheads	501		

Normal loss in processing is 6 per cent of total input and normal scrapped units fetch Re 1 each.

Prepare the following statements for Process A for December: (a) Statement of equivalent production, (b) Statement of cost, (c) Statement of evaluation, (d) Process 'A' Account.

25. The managing director of a Parshwanath Ltd. consults you as to the minimum price at which he can sell the output of one of the departments of the company which is intended for mass production in future. The company's record shows the following particulars for this department for the previous year:

Production and sales (units)	100
Materials	Rs 13,000
Direct labour	7,000
Direct charges	1,000
Works oncost	7,000
Office oncost	2,800
Selling oncost	3,200
Profit	5,200
	39,000

You ascertain that 40 per cent of the work oncost fluctuates directly with production and 70 per cent of selling oncost fluctuates with sales. It is anticipated that the department would produce 500 units per annum, the direct labour charges will be reduced by 20 per cent, while fixed work oncost charges will increase by Rs 3,000. Office oncost and fixed selling oncost are anticipated to show increase of 25 per cent but otherwise no changes are expected. Prepare a statement for submission to your client.

26. Amar Ltd. has received an order for three different types of casting, weighing 18, 45, and 27 tonnes respectively; 10 per cent of the raw materials used are wasted in manufacturing and are sold as scrap for 20 per cent of their cost price.

The cost of raw materials is Rs 250 per tonne, the respective wages for the three types of casting are Rs 4,000, Rs 10,500 and Rs 5,500 respectively. The costs of the moulds for the three different types of castings are Rs 400, Rs 500 and Rs 300 respectively.

If the factory overhead charges are 40 per cent of the wages in each case, determine the cost of each type of casting.

27. Ram Limited obtained a contract for the erection of a multi-storey building. Building operations started in July last year. The contract price was Rs 9,00,000. On June 30, the end of the current financial year, the cash received on account was Rs 3,60,000, being 80 per cent of the amount on the surveyor's certificate. The following additional information is given.

Materials issued to contractor	Rs 1,80,000
Materials on hand at site as on June 30	7,960
Wages	2,46,700
Plant purchased specially for contract and to be depreciated at 10 per cent per annum	31,000
Direct expenses incurred	12,900
General overhead allocated to contract	7,900
Work finished but not yet certified cost	15,000

You are required to prepare the contract account and statement showing the profit on the contract till the end of the current year ending June indicating what proportion of the profit the company would be justified in taking to the credit of the profit and loss account, and to show what entries in respect of the contract would appear in the balance sheet.

28. Navdeep Ltd. is engaged on two contracts during they year. The following information relates to these contracts, which commenced on January 1 and July 1, respectively.

	Contracts	
	A	*B*
Contract price	Rs 3,00,000	Rs 4,00,000
Direct materials issued	55,200	44,000
Materials returned to store	500	1,000
Direct labour payments	48,100	32,300
Wages accrued, December 31	2,500	2,500
Plant installed at cost	30,000	45,000
Establishment charges	25,000	15,000
Direct expenses	15,300	10,000
Direct expenses accrued, December 31	1,000	500
Work certified by architect	1,60,000	81,000
Cost of work not yet certified	10,200	15,000
Materials site, December 31	5,500	4,000
Cash received from contractees	1,51,000	60,000
Depreciation of plant per annum (per cent)	33.33	10

Show the accounts for these contracts and for the contractees.

29. Ratnajyot Ltd. took a contract for construction of a building for Rs 12,00,000 at the beginning of the current year. The following information is available from the records maintained by the company.

You are informed that it is the practice of the company to take credit to take for 60 per cent of profit earned on the contracts in progress after taking into account the value of the work certified for payment by architect. You are required to write the contract account for the year and the contractee's account as on December 31 from the following data:

Contract price	Rs 12,00,000
Direct materials issued	3,26,000
Direct labour	4,10,000
Plant installed at cost	2,50,000
Establishment charges	76,000
Direct expenses	1 ,10,000
Work certified by architect	10,50,000
Cost of work not certified	50,000
Value of plant as at December, 31	2,10,000
Materials at site on December, 31	25,000
Cash received from contractee	9,45,000

30. Avirat Ltd. manufactures a product which involves two processes: Pressing and Polishing. For the month of September, the following information is available:

	Pressing	Polishing
Opening stock	—	—
Input of units in process	1,200	1,000
Units completed	1,000	500
Units under process	300	500
Material cost	Rs 96,000	Rs 8,800
Conversion costs	2,28,000	52,000

For incomplete units in process charge material cost at 100 per cent and conversion costs at 60 per cent in the Pressing process and 50 per cent in the Polishing process. Prepare a statement of cost and calculate the selling price per unit, which will result in 25 per cent profit on the sale price.

31. The standard input and output in a chemical process are as follows:

Input (standard)

Raw material 2,100 kgs at Re 1 per kg

Labour and overhead, Re 1 each per kg

Output (standard)

A 1,000 kgs at Rs 3 per kg; Sale price, Rs 4 per kg

B 800 kgs at Rs 5 per kg; Sale price, Rs 6.50 per kg

C 100 litres at Rs 11 per litre; Sale price, Rs 12 per litre,

A can be processed further into another product, X, after incurring an additional

expenditure of Re 1 per kg on labour and Rs 0.50 per kg on overheads. No loss in the process is anticipated.

B can also be processed further into another product, Y. for which process labour and overheads at Re 1 per kg each are to be incurred. There will be a process loss of 2 per cent which is to be taken as normal. X and Y have ready markets and they are likely to sell for Rs 4.50 and Rs 10 per kg respectively.

Your are required to:

1. Analyse and present the data in a suitable form with a view to evaluating the inter-departmental processing of X and Y.
2. Give your interpretation of the situation for the benefit of the top management stating what information revealed in the analysis you would seek before making you recommendation.

32. Mr Punit has a small furniture factory. He specialises in the manufacture of small dining tables of standard size-of which he can make 15,000 in a year. The cost per table worked out as under for the previous year when he-made and sold 10,000 tables:

Materials	Rs 30
Labour	10
Overhead (fixed), recovered @ 50 per cent of material cost	16
Total cost	55

Prices are fixed by adding a standard margin of 10 per cent to the total cost arrived at above. In the current year, due to fall in the cost of materials, total cost worked out as under:

Materials	Rs 20
Labour	10
Overheads recovered @ 50 per cent of material cost	11
	40

Mrs Punit maintained his standard margin of of 10 per cent on the cost of sales. Sales were at the previous year's level. You are asked to: (i) Determine profit or loss for the current year, (ii) Compute the price which should be charged in the current year to yield the same profit or loss as in previous year.

33. Saheb Limited operates a fleet of lorries. The records of Lorry number 10 reveal the following information for the month of June of the current year:

Days available	27
Days operated	22
Total kilometres covered	800
Total trips made	28
Total tonnage carried	3,000

You also find the following:

Operating costs (June): Petrol, oil and grease, Rs 600; Wages: driver, Rs 1,600; attendant, Rs 800 and mechanic, Rs 200

Maintenance costs (estimated for the current year), Rs 440; Fixed costs (estimated for the current year): Insurance, Rs 1,920; Road tax, Rs 1,200; Miscellaneous, Rs 800; Capital cost, Rs 52,000; Residual value estimated to be Rs 12,000; effective life, 5 years. Administration and other overheads, Rs 11,000 for the current year.

Prepare an operating cost statement determining cost per km operated and cost per tonne-km.

34. Solapur Ltd. manufacture product A, which yields two by products, B and C. The actual joint expenses of manufacture for a period were Rs 80,000. It was estimated that the profit on each product as a percentage of sales would be 30, 25 and 15 respectively. The subsequent manufacturing expenses were as follows.

	A	B	C
Materials	Rs 1,000	Rs 750	Rs 250
Direct wages	2,000	1,250	500
Overheads	1,600	1,250	750
	4,500	3,250	1,500
Sales	60,000	40,000	25,000

The expenses other than manufacturing (if any) were apportioned to the product on the basis of the sales revenue.

Prepare a statement showing the apportionment of joint expenses of manufacture to the different products.

35. Anupam Ltd. secured a contract at a price of Rs 5,00,000. Work began on July 1 and the contract ledger account showed the following items debited upto March 31, in the following year:

Materials	Rs 90,000
Wages	1,06,000
Direct charges	5,000
Plant	17,000
The measurement at March 31 , reads as follows:	
Total work done certified to date	2,46,000
Total work done for last measurement	2,10,000
Total work done for month	30,000

Less retention money, (10 per cent)		3,000
		27,000
Material on site	Rs 5,000	
Less 20 per cent	1,000	4,000

Prepare a proforma account for the contract showing the profit earned to data, and indicate by means of a note the basis on which you arrive at the amount which may be carried to profit and loss account. Allow for " depreciation on the plant at 10 per cent per annum.

36. The following information is available for the process IV of Sashi Ltd, for the month of March:

Opening stock, 4,800 units at Rs 16,560

Degree of completion (per cent): Material, 70; Labour, 60; Overheads, 60.

Transfer from process III, 30,600 units at Rs 30,600

Transfer to process V, 27,600 units

Direct material added in process IV, Rs 13,440

Direct labour added in process IV, Rs 39,420

Production overhead incurred, Rs 52,560

Units scrapped, 2,400

Degree of completion (per cent): Material, 100; Labour, 70; Overheads, 70.

Closing stock, 5,400 units

There was normal loss in the process at 10 per cent of the production. Units scrapped were sold at Re 1 per unit.

From the above information, prepare the (a) statement of equivalent production; (b) cost of equivalent unit for each element of the cost, the loss, the work-in-process etc; (c) process accounts. Adopt the FIFO method.

37. Nagri Ltd manufactures a product in the process costing and its work-in-process stocks at the end of each month are valued on FIFO basis. At the beginning of the month of June, the inventory of work-in-process showed 400 units, 40 per cent complete, valued as follows:

Material	**Rs 3,600**
Labour	3,500
Overheads	**1,000**
	8,000

In the month of June, materials were purchased for Rs 75,000. Wages and

overheads in the month amounted to Rs 79,800 and Rs 21,280 respectively. Actual issue of material to production was Rs 68,500. Finished units in stock in the month were 2,500. There was no loss in process.

At the end of the month, the work-in-process inventory was 500 units, 60 per cent complete as regards labour and overheads and 80 per cent complete as regards material.

Prepare a process account for recording the month's transactions and prepare a process cost sheet showing total and unit costs.

38. Akhil owns a bus which runs from Delhi to Agra and back, for 25 days in a month. The distance from Delhi to Agra is 170 miles. The bus completes the trip from Delhi to Agra and back on the same day.

Calculate the rate the person should charge a passenger when he wants to earn a profit of 33.33 per cent on cost. The other information is given below:

Cost of the bus	Rs 3,00,000
Depreciation rate	20
Salary of the driver per month	1,050
Salary of the conductor per month	700
Salary of the accountant per month	480
Insurance per annum	6,720
Diesel consumption, 16 miles per gallon	25
Local taxes per annum	1,200
Lubricant oil per 100 kms	21
Repairs and maintenance per annum	1,000
Licence fees per annum	2,840
Normal capacity (persons)	50

The bus is generally full 90 per cent of the capacity both ways. Interest is payable on the cost of the bus at 10 per cent per annum.

39. Abdul Ltd., which uses a large amount of coal is situated between two collieries, X and Y, the former being 5 kilometres and the latter 10 kilometres distant, from the factory. A fleet of lorries of 5-tonne carrying capacity is used for the collection of coal from the pitheads. The lorries average a speed of 20 kms. per hour when running and regularly take 10 minutes in the factory premises to unload. At colliery X loading time averages 30 minutes per load, and at colliery Y 20 minutes per load.

Driver's wages, licences, insurance, depreciation, garage and similar charges cost Rs 6 per hour operated. Fuel, oil, tyres, repairs and similar charges cost 60 paise per kilometre run.

Draw up a statement showing the cost per to:ne-kilometre of carrying coal from each colliery. If the coal is of equal quality and price at pithead, from which colliery

should the purchases be made? 9.22 Union Transport Company Ltd. supplies the following details in respect of a truck of a 5-tonne capacity:

Cost of truck	Rs 90,000
Diesel, oil, grease (per trip each way)	16
Repairs and maintenance (per month)	500
Driver's wages (per month)	500
Cleaner's wages (per month)	250
Insurance (per year)	4,800
Tax (per year)	2,400
General supervision charges (per year)	4,800

The truck carries goods to and from the city covering a distance of 50 kms each way.

On the outward trip, freight is available to the extent of full capacity and on the return, 20 per cent of capacity. Assume that the truck runs on an average 25 days a month and work out—

(a) Operating cost per tonne—km

(b) Rate per tonne per trip that the company should charge if profit of 50 per cent on freight is to be earned.

40. Calculate the estimated cost of production of by-products X and Y at the point of separation from the main product, in Swaroop Ltd.

	By-product X	By-product Y
Selling price per unit	Rs 12	Rs 24
Cost per unit after separation from the main product	4	5
Units produced	500	200

Selling expenses amount to 25 per cent of total works cost, that is, including both pre-separation and post-separation work costs. Selling prices are arrived at by adding 20 per cent to the total costs.

41. Beta Ltd operates a simple chemical process to convert a single basic material into three separate products, A, B, and C which are being separated at a single split-off point. A and B are ready for sale immediately after split-off without further processing or any other additional cost. Product C is processed further before being sold. During the year ending December 31, the following quantities were sold and the realisations were:

Product	Quantity (tonnes)	Sales value
A	700	Rs 19,20,000
B	1,700	34,00,000
C	875	14,00,000

There were no opening inventories of A, B and C. Total manufacturing costs for the year were Rs 50,50,000.

Costs after split-off point to process product C were Rs 3,00,000.

On December 31, the closing stocks were: A, 900 tonnes; B, 300 tonnes; C, 125 tonnes.

Prepare a statement of the 'cost' of inventories, A, B, and C. Your presentation should include a summary of the cost of goods sold by product line and unit costs.

42. From the following details prepare a statement of equivalent production, statement of cost and find the value of: (a) Output transferred, and (b) Closing work-in-progress applying average method of valuation of process stock for Krishna Ltd.

Opening work-in-process		2,000 units
Material	Rs 7,500	
Labour	3,000	
Overheads	8,000	

There are 2,000 units in process and the stage of completion (per cent) is estimated to be:

Material	100
Labour	50
Overheads	50

8,000 units are transferred to next process. The process costs for the period are:

Material	Rs 1,00,000
Labour	78,500
Overheads	39,000

43. In Sev Ltd., Product Z yields by-products, X and Y. The joint expenses of manufacturing are Rs 65,500. From the following additional information, show how you would apportion the joint expenses incurred in manufacturing.

	X	Y	Z
1. Sales	Rs 1,00,000	Rs 40,000	Rs 25,000
2. Manufacturing costs after separation	20,000	5,000	4,000
3. Estimated selling expenses as percentage on sales	20	23	20
4. Estimated profit as percentage on sales	20	25	30

44. The Navin Ltd processes crude oil in department 1. During the current period, the following cost were incurred in department 1 to obtain 20,000 barrels of product A and 30,000 barrels of product B.

Direct material	Rs 50,000
Direct labour	1,50,000
Variable overhead 7	5,000
Fixed overhead	53,000

3,29,000

Product A could be sold at the split-off point for Rs 5 per barrel or processed in department 2 at an additional cost of Rs 4 per barrel and then sold for Rs 10 per barrel. During the current period, all 20,000 barrels of A were processed in department II. There was an ending inventory of 5,000 barrels of A.

Product B must be processed further in department 3. The following information from the current period is available about department 3: Barrels processed, 31,000; Costs, Rs 3,10,000.

Included in 31,000 barrels are 1,100 barrels from the previous periods' production of department 1 processed in this period. There is a closing inventory of 1,000 barrels of B. The selling price of B is Rs 20 per barrel.

You are required to determine the cost of the closing finished inventory using the net realisable value method to allocate the joint costs.

45. Mr Sunit owns a fleet of taxis and the following information is available from the records maintained by him:

Number of taxies	10
Cost of each taxi	Rs 54,600
Salary of manager (per month)	700
Salary of accountant (per month)	500
Salary of cleaner (per month)	200
Salary of mechanic (per month)	400
Garage rent (per month)	610
Insurance premium (per cent per annum)	5
Annual tax per taxi	900
Driver's salary (per month)	350
Annual repairs	1,000

Total life of a taxi is about 2,00,000 kms. A taxi runs, in all, 3,000 kms in a month and 30 per cent of this distance has to be run without any passengers. Petrol consumption is one litre for every 10 kms, Rs 4.41 per litre. Oil and other sundries are Rs 10.50 per 100 kms.

46. Mr Anuj runs a tempo service in the town and has two vehicles. He furnishes you the following data and wants you to compute the cost per running-km.

	Vehicle A	Vehicle B
Cost of vehicle	Rs 25,000	Rs 15,000
Road licence per year	750	750
Supervision and salary (yearly)	1,800	1,200
Driver's wages per hour	5	4
Cost of fuel per litre	1.50	1.50
Repairs and maintenance per km	1.50	2.00
Tyre cost per (km)	1.00	0.80
Garage rent per year	1,600	550
Insurance premium (yearly)	850	500
Km run per litre	6	5
Km run during the year	1 5,000	6,000
Estimated life of vehicles (kms)	1 ,00,000	75,000

Charge interest at 10 per cent per annum on the cost of vehicle. The vehicles run 20 kms. per hour on an average.

47. Anil Ltd. makes a product by two processes. For the month of June, the information recorded for the second process was:

A work-in-process balance of 400 units brought forward from May was valued at Rs 5,760. During June, 17,040 units were transferred from the first to the second process at a cost of Rs 1,32,320. Costs incurred by the second process were:

Direct material issued Rs 64,288

Direct wages 31,696

Overheads 15,948

The transfer of finished goods to stock was 15,120 units. Units scrapped during the period were 880. Work-in-process at the end of the month was 1,440 units.

There was a normal loss of 5 per cent of production. Units scrapped were sold at Rs 3 each. The particulars relating to degree of completion was as under: Degree of Completion (Per Cent)

	Opening stock	Closing stock	Scraps
Direct material	70	80	100
Direct wages	50	60	80
Overheads	50	60	80

Show the account of the second process as also other necessary accounts.

48. The following is the trial balance of Nepali Ltd, engaged in the execution of contract number 313, for the current year ending December 31:

Contractee's account: (75 per cent of work certified)		Rs 3,60,000
Accumulated depreciation account		50,000
Creditors		13,000
Buildings	Rs 2,00,000	
Bank balance	46,000	
Share capital		5,10,000
Materials	2,10,000	
Wages	1,80,000	
Expenses	47,000	
Plant	2,50,000	
	9,22,000	9,22,000

The work on contract number 313 commenced on January 1.

Materials costing Rs LT-0,000 were sent to the site of the contract but those costing Rs 6,000 were destroyed in an accident. Plant costing Rs 50,000 was used on the contract all through the year. Plant costing Rs 2,00,000 was used from January 1 to September 30 and was then returned to the stores.

The contract was for Rs 6,00,000 and the contractee paid 75 per cent of the work certified. The cost of work uncertified was estimated to be Rs 15,000 on December 31 on which date materials costing Rs 4,000 were at the site of the contract.

Expenses are charged to the contract @ 25 per cent of wages. Plant is to be depreciated at 10 per cent according to the straight line method for the entire year.

Prepare contract number 313 account for the current year ending December 31 and make out the balance sheet of Nepali Ltd. as on that date.

49. In Chicago Ltd., a product passes through two processes, A and B for completion. Output of process A is transferred to process B at cost plus 25 per cent and finished output of B is similarly transferred to finished stock at cost plus 25 per cent. There is no work-in-process at December 31. On this date, the following information is available:

	Process A	Process B
Materials consumed	Rs 8,000	Rs 24,000
Wages	12,500	16,000
Closing stock (valued at cost price)	4,000	12,000

Out of the finished stock, a portion valued at Rs 11,000 remained in hand, the balance was sold for Rs 58,000. Prepare process accounts and finished stock account. The overhead and opening stock are to be ignored. Also show how much reserves will be created for unrealised profit.

50. In Samved Ltd. the main product, A, a company processes the resulting waste material into two by-products, Ml and M2. Using the method of working back from sales value to an estimated cost, you are required to prepare a comparative profit and loss statement of the three products from the following data. 1. Total cost up to separation point was Rs 1,36,000.

	A	M1	M2
2. Sales (and production)	Rs 3,28,000	Rs 32,000	Rs 48,000
3. Costs after separation		9,600	14,400
4. Estimated net profit percentage to sales value	____	22	30
5. Estimated selling expenses as percentage to sales value	20	20	20

51. Ravindra Ltd undertook a contract for erecting a sewerage treatment plant for a municipality for a total value of Rs 24 lakh. It was expected that contract would be completed by March 31, next year. You are required to prepare a contract account for the year ending March 31, current year from the following particulars:

(i) Wages, Rs 6,50,000; (ii) Special plant, Rs 2,10,000; (iii) Materials, Rs 3,00,000; (iv) Overheads, Rs 1,25,000; (v) Depreciation @ 10 per cent to be provided on plant; (vi) Materials lying at site on January 31, current year, Rs 45,000; (vii) Work certified was to the extent of Rs 16,00,000 and 80 per cent of the same was received in cash; (viii) 5 per cent of the value of materials issued and 6 per cent of the wages may be taken to have been incurred for the proportion of work completed but not yet certified; (ix) Overheads are charged as a percentage of direct wages; (x) Ignore depreciation on plant for use of uncertified portion of work; (xi) Ascertain the amount to be transferred to profit and loss account on the basis of realised profit.

52. Kashi Limited commenced a contract on July 1, of the current year. The total contract price was Rs. 5,00,000 but Rex Limited accepted the same for Rs 4.50,000. It was decided to estimate the total profit and to take to the credit of profit and loss account that proportion of estimated profit on cash basis which the work completed bore to the total contract. Actual expenditure till December 31, and estimated expenditure in next year are given below:

Expenses	*Actuals till December 31*	*Estimate for next year*
Materials	Rs 78,000	Rs 1,30,000
Labour	59,000	60,000
Plant purchased (original cost).	45,000	—
Miscellaneous expenses	20,000	35,900
Plant returned to stores on December 31,		
at original cost	10,000	25,000
		(as at September 30)
Materials at site	5,000	Nil
Work certified	2,00,000	Full
Work uncertified	7,500	Nil
Cash received	1,80,000	Full

The plant is subject to annual depreciation @ 20 per cent of original cost. The contract is likely to be completed on September 30, next year.

You are required to prepare the contract account for the current year ended. December 31. Workings should be clearly given.

It is the policy of the company to charge depreciation on time basis.

53. The data given below relate to the month of January and February of the current year in a department of a factory owned by Smita Ltd. which manufactures certain chemicals by a continuous process.

Data: For January	Degree of completion (per cent)	Amount (200 units)
Opening work-in-process		
Direct materials	100	Rs 231.40
Conversion costs	40	93.10
Inputs		
Direct materials	1,400 (units)	2,126.60
Conversion cost		2,742.90
Output passed by inspection	1 ,345 (units)	
Closing work-in-process	220 (units)	
	Degree of completion (per cent)	
Direct materials	100	
Conversion cost	35	
For February:		
Inputs	Units	Amount
Direct materials	1,550	2,452.40
Conversion cost		3,385.80
Output passed by inspection	1,555	
Closing work-in-process	190	
	Degree of completion (per cent)	
Direct materials	100	
Conversion cost	20	

Normal wastage is budgeted at 2 per cent of the physical input of materials and is regarded as comprising units on which both direct labour and full conversion costs have been expended. The department is credited at Rs 4 per unit with output passed by the inspection department.

You are required to calculate the following for the department for each month, using the average costs: (i) Profit made; (ii) The value of closing work-in-process.

54. In Sevak Ltd., product A passes through three processes before it is transferred to finished stock. The following information is obtained for the month of July:

	Process 1	Process II	Process III	Finished stock
Opening stock	Rs 5,000	Rs 8,000	Rs 10,000	Rs 20,000
Direct materials	40,000	13,000	15,000	—
Direct wages	35,000	40,000	35,000	—
Manufacturing overheads	21,000	24,000	20,000	—
Closing stock	10,000	4,000	15,000	30,000
Profit percentage on transfer				

price to next process	25	20	10	—
Inter-process profit for opening stock	—	1,395	2,690	6,534

Stocks in process are valued at cost price and finished stock has been valued at the price at which it is received from Process III. Sales during the period were Rs 4,00,000.

Prepare and compute: (a) Process cost accounts showing the profit element at each stage, (b) Actual realised profit, and (c) Stock valuation for the balance sheet.