COST ESTIMATING

- Definition
- Cost estimating may be defined as process of forecasting the expenses that must be incurred to manufacture a product.
- These expenses take into consideration all expenditures involved in design and manufacturing, with all related service facilities , general administration and selling costs.
- Cost estimates are the joint product of the engineer and the cost accountant , and involves two factors: physical data and costing data. The engineer do the manufacturing planning by determine the physical data. The cost accountant compiles and applies the costing data

Purpose of Cost estimation .

- To determine the selling price of a product for a quotation or contract to ensure a reasonable profit to the company.
- To check the quotation supplied by the vendors
- To decide whether a part or assembly is economical to be manufactured in the plant or is to be purchased from outside
- To determine the most economical process or material to manufacture a product
- To initiate means of cost reduction in existing production facilities by using new materials which result in savings due to lower scrap loss and revised methods of tooling and processing .
- To determine standards of production performance that may be used to control costs.

Cost Accountant or Costing

- It is the determination of an actual cost of a component after adding different expenses incurred in various departments or it may be defined as system which systematically records all the expenditures to determine the cost of manufactured products. The work of cost accounting begins with the pre-planning stage of the product and ends only after the whole lot of the product has been fully manufactured.
- Difference between cost estimation and cost accounting:

  Cost estimation is determining the anticipated or probable cost of a job much before the manufacturing of the job is undertaken, whereas **cost accounting** is the compilation of actual cost after the job has been completed.

Difference between cost estimation and cost accounting cont.

- Cost estimation gives predicted or standard cost, whereas cost accounting gives actual or postmortem costs.

- Purpose of cost accounting:

1. To compare the actual cost with the estimated cost to know whether the estimated cost had been realistic or not
2. Wastages and undesirable expenses are pointed out requiring corrective measures
3. The costing data helps in changing the selling price because of change in material cost or labour cost etc.
4. It helps to locate the reasons for the increase or decrease of loss or profits of a company.

Purpose of cost accounting cont.

5. It helps in determining the discount on market price of the product.
6. The actual cost helps the company to decide whether to continue with the manufacture of a product or to buy it from outside
7. It helps the enterprise to prepare its budget.
8. The costing data helps to formulate policies and plans for the pricing of a new job
9. It helps in regulating from time to time the production of a job so that it may be profitable to the company

Classification of costs

- Nonrecurring costs: These costs are also called “capital costs” and are one-time costs. These costs consists of two parts: fixed capital costs and nondepreciated capital costs. Fixed capital costs include depreciable items such as plant building, manufacturing equipment and tools. Nondepriciation capital cost includes land.
- Recurring cost. This cost is a direct function of manufacturing process. It’s also called “operating cost” or “manufacturing cost”
- Fixed costs. Fixed costs associated with a productive unit , those costs which are independent of the rate of production of components. These costs will be there whether the facilities are being utilized or not

Classification of costs cont.

- Variable costs: These costs vary with the rate of production. If there is no production, variable costs will be nil.
- A cost can be termed as “direct cost” or ”indirect cost “
- Direct cost: is that cost which can be directly assigned to a product
- Indirect cost: can be directly assigned to a product but must be spread over an entire factory.

- Working Capital. Working capital includes funds over and above the fixed capital and land investment, to get a facility started and to provide for the future financial obligation as they occur.

Working Capital cont.

- Working capital consists of:

1. Raw material on hand
2. Semi finished products in the process of manufacture
3. Finished products in the inventory
4. Account receivable
5. Cash in hand needed fro day-to-day operation

- Working capital remains tied up during the useful life of the plant , but it is considered to be fully recoverable at the end of the life of the facility.

Turn Over Ratio

- This concept provided a rough estimate of the investment cost of a new product.

- Turn Over Ration = $\frac{Annual\ Sales}{Total\ investment}$

- Element of Costing:

The constituents of cost of a product or the “cost element “ are:

1. Material cost
2. Labour cost
3. Expenses

Element of Costing cont.

1. **Material cost**. Material is divided into two basic categories

- (a) material for fabricated parts (b) standard purchased parts . The total cost of these two will give the material cost. Again there are two kinds of materials which comprise the factory cost of a product. These are : Direct material and indirect material
- Direct material. The direct material is the raw material which is processed in the plant and finally forms the finished product. Any standard part which also becomes a part of the finished product will also come under the category of direct material.
- Indirect material . Indirect materials are those which help in the processing of direct materials into the finished product.

Element of Costing cont.

- Indirect materials don't form a part of the finished product. Indirect materials include: shop supplies such as cotton waste, lubricating oil, cutting fluids, oil, shielding glasses used in arc welding, etc.

2. **Labour cost**: Labour which enter into the manufacture of a product is of two categories: Direct labour and Indirect labour

- Direct labour. The operator or operators which actually process the raw material either on machine or manually form the direct labour
- Indirect labour: All the staff including sales executives officer, administrative staff, foremen, maintenance staff etc. come under indirect labour

Element of Costing cont.

3. **Expenses**: Total cost of the product minus the costs of direct material and direct labour constituted the Expenses or overhead

Overhead can be grouped into two main categories:

- Fixed overheads or Constant overhead: These are indirect expenses which remain constant or fixed irrespective of volume of production. These items include: salaries of high officer, capital taxes, insurance charges, depreciation on building, plant machinery, rent of buildings etc.
- Variable or floating overhead: Overheads which vary with the volume of products such as power, fuel, repairs of machines, factory lighting , sales officer expenses etc.

Cost Structure

- Prime cost. Prime cost or direct cost = Direct material + Direct labour
- Factory cost = Prime cost + Factory expenses
- Manufacturing cost or cost of production = factory cost + Administrative expenses
- Total cost = Manufacturing cost + Selling cost + Distributing expenses
- Selling cost = Total cost + Profit

Data Requirements for Cost Estimating

- The following detailed data are required by the estimator to arrive at an accurate estimate of a new product:

1. General design specification , i.e. a brief description of the product, its function, performance and purpose.
2. Quality and rate of product
3. Assembly or layout drawing s
4. List of sub-assemblies of the product
5. Detailed drawings and a bill of material for the product
6. Material release data
7. Operation analysis
8. Standard time data
9. Machine tool and equipment required

Data Requirements for Cost Estimating

10. Tools, gauge, and special fixtures, jigs or dies required
11. Manufacturing routings
12. Test and inspection equipment and procedures
13. Packaging and transportation requirements
14. Area and building requirements

Steps in Making a Cost Estimate

- The cost of a new product may be estimated by following the basic steps given below:

1. Make a complete and thorough analysis of the cost request to understand it fully
2. Make an analysis of the part or product and separate lists of standard parts and the parts to be fabricated within the plant
3. Make a manufacturing process plan for the parts to be fabricated
4. Determine the material costs for the standard and the fabricated parts
5. Estimate the total production time for each operation listed in step 3

Steps in Making a Cost Estimating cont.

6 . Apply the labour and burden rates to each operation

7. Add the material costs step 4 and the labour and burden costs step 6. This will give the total manufacturing cost

8. Apply the profit factors to arrive at the selling price.

Cost estimate may not be exactly the same as the actual manufacturing cost. The significant causes for the cost deviation can be: Fluctuations in material and labour costs, incomplete design information at the time of estimate, unexpected delays resulting in premiums paid for overtimes and materials and the unexpected machining or assembly problems.

Example 1

- Calculate the total cost and selling price for a job:

Direct material = ₦5,500

Manufacturing wages = ₦3,000

Factory overheads to manufacturing wages = 100%

Non-manufacturing overheads to factory cost = 15%

Profit on total cost = 12%

Solution:

Manufacturing wages (Direct labour) = ₦3000

Factory overheads = 100% of ₦3000 = ₦3000

Factory cost = Direct material + Direct labour + Factory overheads

= ₦5,500 + ₦3,000+ ₦3,000

= ₦11,500

Example 1

- SOLUTION CONT.

Non-manufacturing overheads, i.e,

administrative and selling overheads = 15% of ₦ 11,500

= ₦1725

Total cost = Factory cost + ₦1725

=₦11500 + ₦1725

= ₦13225

Profit = 12% of total cost

= 12% of ₦13225

= ₦1587

Selling price = Total cost + Profit

= ₦13225 + ₦1587

= ₦14812

Example 2

From the records of a company, the following data are available:

i Raw materials

opening stock = ₦20,000

closing stock = ₦30,000

Total purchases during the year = ₦170,000

ii. Finished goods

Opening stock = ₦10,000

Closing stock = ₦15,000

Sales = ₦489,500

iii. Direct wages = ₦120,000

iv. Factory expenses = ₦120,000

v. Non-manufacturing expenses = ₦50,000

Find out what price should be quoted for a product involving an expenditure of ₦20,000 in material and ₦30,000 in wages

Solution

We need to determine the rate of factory expenses, non-manufacturing expenses and profit from the given data

Direct material cost = opening stock + total purchases during the year- closing stock = ₦20,000 + ₦170,0000 – ₦30,000

= ₦160,000

Direct wages = ₦120,000

Factory expenses = ₦120,000

Factory cost = ₦160,000 + ₦120,000 + ₦120,000

= ₦400,000

Non-manufacturing expenses = ₦50,000

Total cost = ₦400,000 + ₦50,000

= ₦450,000

Solution Cont.

- Cost of finished goods sold = opening stock + cost of goods manufactured – closing stock

  = ₦10,000 + ₦450,000 + ₦15,000

  = ₦445,000

  Total sales = ₦489,500

  Profit = ₦489,000 – ₦445, 000

  = ₦44,500

i. Factory expenses(% of direct wages) = $\frac{120{,}000 \times 100}{120{,}000}$

= 100 %

ii. Non-manufacturing expenses to factory cost = $\frac{50{,}000 \times 100}{40{,}000}$

= 12.5%

Solution Cont.

iii. Profit to cost of sales = $\frac{44{,}500 \times 100}{445{,}000}$ = 10%

Now the cost of the product can be quoted as follows:

Direct material = N20,000

Direct wages = N30,000

Factory expenses (100% of wages) = N30,000

Factory cost = 20,000 + 30,000 + 30,000 = N80,000

Non-manufacturing expenses (12.5% of factory cost)

$$\frac{80{,}000 \times 100}{100}$$

= N10,000

Solution Cont.

Total cost = ₦80,000 + ₦10,000

= ₦90,000

Profit (10% of total cost) = ₦9,000

Selling price = ₦90,000 + ₦9,000

= ₦99,000

END