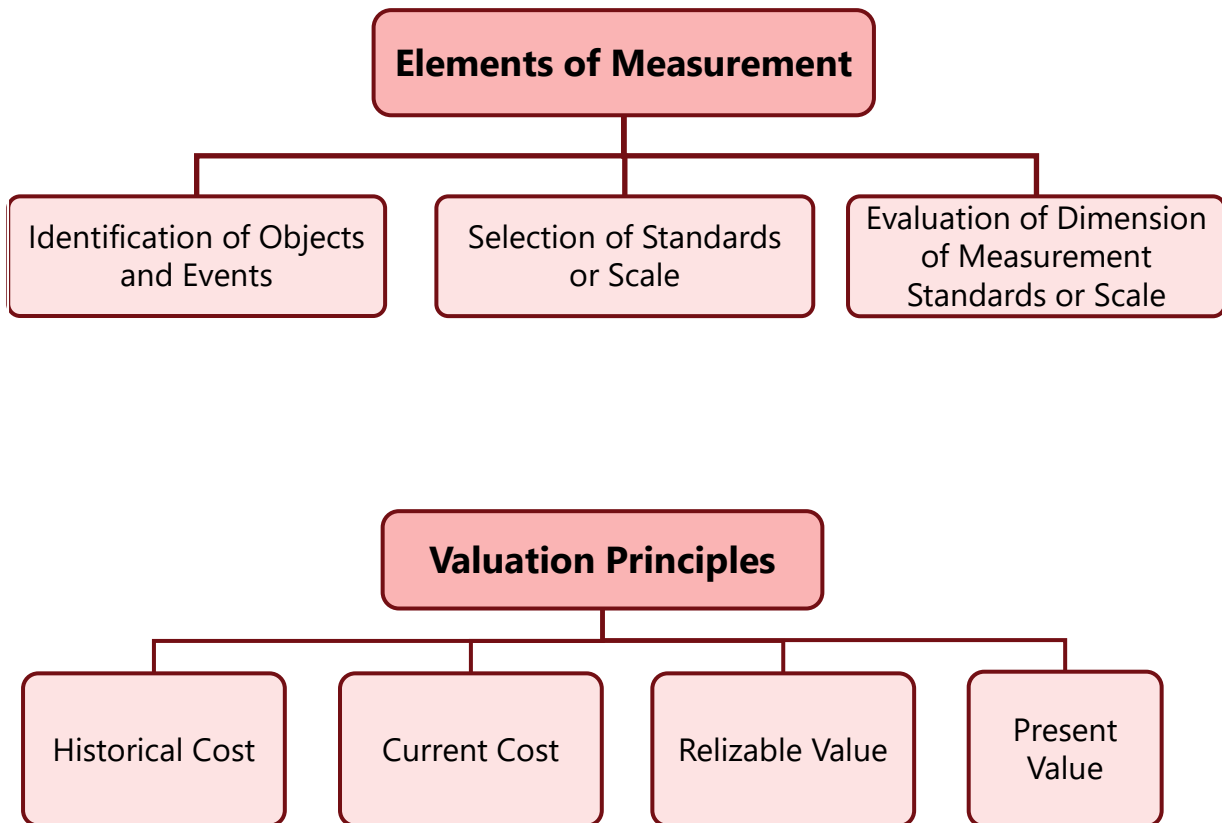


## **UNIT – 6 ACCOUNTING AS A MEASUREMENT DISCIPLINE – VALUATION PRINCIPLES, ACCOUNTING ESTIMATES**

### **LEARNING OUTCOMES**

**After studying this Unit, you will be able to:**

- ◆ Understand the meaning of measurement and its basic elements.
- ◆ Know how far accounting is a measurement discipline if considered from the standpoint of the basic elements of measurement.
- ◆ Distinguish measurement from valuation.
- ◆ Learn the different measurement bases namely historical cost, realizable value and present value.
- ◆ Understand the measurement bases which can give objective and valuation to transactions and events.
- ◆ Understand that the traditional accounting system mostly uses historical cost as measurement base, although in some cases other measurement bases are also used.

**UNIT OVERVIEW****6.1 MEANING OF MEASUREMENT**

Measurement is vital aspect of accounting. Primarily transactions and events are measured in terms of money. Any measurement discipline deals with three basic elements of measurement viz., identification of objects and events to be measured, selection of standard or scale to be used, and evaluation of dimension of measurement standards or scale.

Prof. R. J. Chambers defined 'measurement' as "assignment of numbers to objects and events according to rules specifying the property to be measured, the scale to be used and the dimension of the unit". (R.J. Chambers, Accounting Evaluation and Economic Behaviour, Prentice Hall, Englewood Cliffs, N.J. 1966, P.10).

Kohler defined measurement as the assignment of a system of ordinal or cardinal numbers to the results of a scheme of inquiry or apparatus of observations in accordance with logical or mathematical rules – [A Dictionary of Accountant].

Ordinal numbers, or ordinals, are numbers used to denote the position in an ordered sequence: first, second, third, fourth, etc., whereas a cardinal number says 'how many there are': one, two, three, four, etc.

Chambers' definition has been widely used to judge how far accounting can be treated as a measurement discipline.

According to this definition, the three elements of measurement are:

- (1) Identification of objects and events to be measured;
- (2) Selection of standard or scale to be used;
- (3) Evaluation of dimension of measurement standard or scale.



## 6.2 OBJECTS OR EVENTS TO BE MEASURED

We have earlier defined Accounting as the process of identifying, measuring and communicating economic information to permit informed judgements and decisions by the users of the information. So accounting essentially includes measurement of 'information'.

Decision makers need past, present and future information. For external users, generally the past information is communicated.

There is no uniform set of events and transactions in accounting which are required for decision making. For example, in cash management, various cash receipts and expenses are the necessary objects and events. Obviously, the decision makers need past cash receipts and expenses data along with projected receipts and expenses. For giving loan to a business one needs information regarding the repayment ability (popularly called debt servicing) of principal and interest. This also includes past information, current state of affairs as well as future projections. It may be mentioned that past and present objects and events can be measured with some degree of accuracy but future events and objects are only predicted, not measured. Prediction is an essential part of accounting information. Decision makers have to take decisions about the unseen future for which they need suitable information.



## 6.3 STANDARD OR SCALE OF MEASUREMENT

In accounting, money is the scale of measurement (see money measurement concept), although now-a-days quantitative information is also communicated along with monetary information.

Money as a measurement scale has no universal denomination. It takes the shape of currency ruling in a country. For example, in India the scale of measurement is Rupee, in the U.K. Pound-Sterling (£), in Germany Deutschmark (DM), in the United States Dollar (\$) and so on. Also there is no constant exchange relationship among the currencies.

If one businessman in India took loan \$5,000 from a businessman of the U.S.A., he would enter the transaction in his books in terms of ₹ Suppose at the time of loan agreement exchange rate was US \$ = ₹ 50. Then loan amounted to ₹ 2,50,000. Afterwards the exchange rate has been changed to \$ 1 = ₹ 55. At the changed exchange rate the loan amount becomes ₹ 2,75,000. So money as a unit of measurement lacks universal applicability across the boundary of a country unless a common currency is in vogue. Since the rate of exchange fluctuates between two currencies over the time, money as a measurement scale also becomes volatile.



## 6.4 DIMENSION OF MEASUREMENT SCALE

An ideal measurement scale should be stable over time. For example, if one buys 1 kg. cabbage today, the quantity he receives will be the same if he will buy 1 kg. cabbage one year later. Similarly, length of 1 metre cloth will not change if it is bought a few days later. That is to say a measurement scale should be stable in dimension. Money as a scale of measurement is not stable. There occurs continuous change in the input output prices. The same quantity of money may not have the ability to buy same quantity of identical goods at different dates. Thus information of one year measured in money terms may not be comparable with that of another year. Suppose production and sales of a company in two different years are as follows:

| Year 1    |          | Year 2    |          |
|-----------|----------|-----------|----------|
| Qty.      | ₹        | Qty.      | ₹        |
| 5,000 pcs | 5,00,000 | 4,500 pcs | 5,40,000 |

Looking at the monetary figures one may be glad for 8% sales growth. In fact there was 10% production and sales decline. The growth envisaged through monetary figures is only due to price change. Let us suppose further that the cost of production for the above mentioned two years is as follows:

| Year 1    |          | Year 2    |          |
|-----------|----------|-----------|----------|
| Qty.      | ₹        | Qty.      | ₹        |
| 5,000 pcs | 4,00,000 | 4,500 pcs | 4,50,000 |

Take Gross profit = Sales – Cost of Production. Then in the first year profit was ₹ 1,00,000 while in the second year the profit was ₹ 90,000. There was 10% decline in gross profit.

So, money as a unit of measurement is not stable in the dimension.

Thus, Accounting measures information mostly in money terms which is not a stable scale having universal applicability and also not stable in dimension for comparison over the time. So it is not an exact measurement discipline.



## 6.5 ACCOUNTING AS A MEASUREMENT DISCIPLINE

How do you measure a transaction or an event? Unless the measurement base is settled we cannot progress to the record keeping function of book-keeping. It has been explained that accounting is meant for generating information suitable for users' judgments and decisions. But generation of such information is preceded by recording, classifying and summarising data. By that process it measures performance of the business entity by way of profit or loss and shows its financial position. Thus, measurement is an important part of accounting discipline. But a set of theorems governs the whole measurement sub-system. These theorems should be carefully understood to know how the cogs of the 'accounting-wheel' work. Now-a-days accounting profession earmarked three theorems namely going concern, consistency and accrual as fundamental accounting assumptions, i.e., these assumptions are taken for granted. Also while measuring, classifying, summarising and also presenting, various policies are adopted. Recording, classifying summarising and communication of information are also important part of accounting, which do not fall within the purview of measurement discipline. Therefore, we cannot simply say that accounting is a measurement discipline.

But in accounting money is the unit of measurement. So, let us take one thing for granted that all transactions and events are to be recorded in terms of money only. Quantitative information is also required in many cases but such information is only supplementary to monetary information.



## 6.6 VALUATION PRINCIPLES

There are four generally accepted measurement bases or valuation principles. These are:

- (i) Historical Cost;
- (ii) Current Cost;
- (iii) Realizable Value;
- (iv) Present Value.

Let us discuss these principles in detail.

- (i) *Historical Cost:* It means acquisition price. For example, the businessman paid ₹ 7,00,000 to purchase the machine and spend ₹1,00,000 on its installation, its acquisition price including installation charges is ₹ 8,00,000. The historical cost of machine would be ₹8,00,000.

According to this base, assets are recorded at an amount of cash or cash equivalent paid at the time of acquisition. Liabilities are recorded at the amount of proceeds received in exchange for the obligation. In some circumstances a liability is recorded at the amount of cash or cash equivalent expected to be paid to satisfy it in the normal course of business.

When a businessman, takes ₹ 5,00,000 loan from a bank @ 10% interest p.a., it is to be recorded at the amount of proceeds received in exchange for the obligation. Here the obligation is the repayment of loan as well as payment of interest at an agreed rate i.e. 10%. Proceeds received are ₹ 5,00,000 - it is historical cost of the transactions.

Take another case regarding payment of income tax liability. You know every individual has to pay income tax on his income if it exceeds certain minimum limit. But the income tax liability is not settled immediately when one earns his income. The income tax authority settles it some time later, which is technically called assessment year. Then how does he record this liability? As per historical cost base it is to be recorded at an amount expected to be paid to discharge the liability.

Companies usually apply historical cost method in case of long-term assets like machinery, furniture, licenses etc.

- (ii) *Current Cost:* Take that Mr. X purchased a machine on 1st January, 2011 at ₹ 7,00,000. As per historical cost base he has to record it at ₹ 7,00,000 i.e. the acquisition price. As on 1.1.2022, Mr. X found that it would cost ₹ 25,00,000 to purchase that machine. Take also that Mr. X took loan from a bank as on 1.1.2011 ₹ 5,00,000 @ 18% p.a. repayable at the end of 15th year together with interest. As on 1.1.2022 the bank announces 1% prepayment penalty on the loan amount if it is paid within 15 days starting from that day. As per historical cost the liability is recorded at ₹ 5,00,000 at the amount or proceeds received in exchange for obligation and asset is recorded at ₹ 7,00,000.

Current cost gives an alternative measurement base. Assets are carried out at the amount of cash or cash equivalent that would have to be paid if the same or an equivalent asset was acquired currently. Liabilities are carried at the undiscounted amount of cash or cash equivalents that would be required to settle the obligation currently.

So as per current cost base, the machine value is ₹ 25,00,000 while the value of bank loan is ₹ 5,05,000.

- (iii) *Realisable Value:* Suppose Mr. X found that he can get ₹ 20,00,000 if he would sell the machine purchased, on 1.1.2011 paying ₹ 7,00,000 and which would cost ₹ 25,00,000 in case he would buy it currently. Take also that Mr. X found that he had no money to pay off the bank loan of ₹ 5,00,000 currently.

As per realisable value, assets are carried at the amount of cash or cash equivalents that could currently be obtained by selling the assets in an orderly disposal. Haphazard disposal may yield something less. Liabilities are carried at their settlement values; i.e. the undiscounted amount of cash or cash equivalents expressed to be paid to satisfy the liabilities in the normal course of business.

So, the machine should be recorded at ₹ 20,00,000 the realisable value in an orderly sale while the bank loan should be recorded at ₹ 5,00,000 the settlement value in the normal course of business.

Realisable value concept is commonly applied in case of inventories. Inventories are measured at the lower of cost and net realisable value.

- (iv) *Present Value:* Suppose we are talking as on 1.1.2022 - take it as time for reference. Now think the machine purchased by Mr. X can work for another 10 years and is supposed to generate cash @ ₹ 1,00,000 p.a. Also take that bank loan of ₹ 5,00,000 taken by Mr. X is to be repaid as on 31.12.2028. Annual interest is ₹ 90,000.

As per present value, an asset is carried at the present discounted value of the future net cash inflows that the item is expected to generate in the normal course of business. Liabilities are carried at the present discounted value of future net cash outflows that are expected to be required to settle the liabilities in the normal course of business.

The concept of Present Value is common in case of accounting for investments and loans.

The term 'discount', 'cash inflow' and 'cash outflow' need a little elaboration. ₹ 100 in hand as on 1.1.2022 is not equivalent to ₹ 100 in hand as on 31.12.2022. There is a time gap of one year. If Mr. X had ₹ 100 as on 1.1.2022 he could use it at that time. If he received it only on 31.12.2022, he had to sacrifice his use for a year. The value of this sacrifice is called 'time value of money'. Mr. X would sacrifice i.e. he would agree to take money on 31.12.2022 if he had been compensated for the sacrifice. So a rational man will never exchange ₹ 100 as on 1.1.2022 with ₹ 100 to be received on 31.12.2022. Then ₹ 100 of 1.1.2022 is not equivalent to ₹ 100 of 31.12.2022. To make the money receivable at a future date equal with the money of the present date it is to be devalued. Such devaluation is called discounting of future money.

Perhaps you know the compound interest rule:  $A = P (1 + i)^n$

A = Amount

P = Principal

i = interest / 100

n = Time

This equation gives the relationship between present money, principal and the future money amount. If A, i and n are given, to find out P, the equation is to be changed slightly.

$$P = \frac{A}{(1+i)^n}$$

Using the equation one can find out the present value if he knows the values of A, i and n.

Suppose i = 20%, now what is the present value of ₹ 1,00,000 to be received as on 31.12.2022 (Take 1.1.2022 as the time of reference).

$$P = \frac{1,00,000}{(1+20)^1} = ₹ 83,333$$

Similarly,

| Time of Receipt | Money Value ₹ | Present Value ₹ |
|-----------------|---------------|-----------------|
| 31.12.2023      | 1,00,000      | 69,444          |
| 31.12.2024      | 1,00,000      | 57,870          |
| 31.12.2025      | 1,00,000      | 48,225          |
| 31.12.2026      | 1,00,000      | 40,188          |
| 31.12.2027      | 1,00,000      | 33,490          |
| 31.12.2028      | 1,00,000      | 27,908          |
| 31.12.2029      | 1,00,000      | 23,257          |
| 31.12.2030      | 1,00,000      | 19,381          |
| 31.12.2031      | 1,00,000      | 16,150          |

Total of all these present values is ₹ 4,19,246. Since the machine purchased by Mr. X will produce cash equivalent to ₹ 4,19,246 in terms of present value, it is to be valued at such amount as per present value measurement basis.



Here, Mr. X will receive ₹ 1,00,000 at different points of time-these are cash inflows. In the other example, he has to pay interest and principal of bank loan-these are cash outflows.

Perhaps you also know the annuity rule:

Present value of an Annuity or Re. A for n periods is

A = Annuity

i = interest

t = time 1, 2, 3, .....n.

$$\frac{A}{i} \left[ 1 - \frac{1}{(1+i)^n} \right]$$

Applying this rule one can derive the present value of ₹ 1,00,000 for 10 years @ 20% p.a.

$$\frac{1,00,000}{0.20} \left[ 1 - \frac{1}{(1+0.20)^{10}} \right] = ₹ 4,19,246$$

Similarly, the present value of bank loan is

$$\frac{90,000}{0.20} \left[ 1 - \frac{1}{(1+0.20)^5} \right] + \frac{5,00,000}{(1+0.20)^5}$$

$$= ₹ 2,69,155 + ₹ 2,00,939 = ₹ 4,70,094$$

Thus, we get the four measurements as on 1.1.2022:

|                      | Historical<br>cost<br>₹ | Current<br>cost<br>₹ | Realisable<br>value<br>₹ | Present<br>value<br>₹ |
|----------------------|-------------------------|----------------------|--------------------------|-----------------------|
| Asset: Machine       | 7,00,000                | 25,00,000            | 20,00,000                | 4,19,246              |
| Liability: Bank Loan | 5,00,000                | 5,05,000             | 5,00,000                 | 4,70,094              |

The accounting system which we shall discuss in the remaining chapters is also called historical cost accounting. However, this need not mean that one shall follow only historical cost basis of accounting. In the later stages of the CA course, we shall see that the accounting system uses all types of measurement bases although under the traditional system most of the transactions and events are measured in terms of historical cost.



## 6.7 MEASUREMENT AND VALUATION

Value relates to the benefits to be derived from objects, abilities or ideas. To the economist, value is the utility (i.e.; satisfaction) of an economic resource to the person contemplating or enjoying its use. In accounting, to mean value of an object, abilities or ideas, a monetary surrogate is used. That is to say, value is measured in terms of money. Suppose, an individual purchased a car paying ₹ 2,50,000. Its value lies in the satisfaction to be derived by that individual using the car in future. Economists often use ordinal scale to indicate the level of satisfaction. But accountants use only cardinal scales. If the value of car is taken as ₹ 2,50,000 it is only one type of value called acquisition cost or historical cost. So value is indicated by measurement. In accounting the value is always measured in terms of money.



## 6.8 ACCOUNTING ESTIMATES

Earlier in this unit we have learned how to measure a transaction, which had already taken place and for which either some value/money has been paid or some valuation principles are to be adopted for their measurement. But there are certain items, which have not occurred therefore cannot be measured using valuation principles still they are necessary to record in the books of account, for example, provision for doubtful debts. For such items, we need some value. In such a situation reasonable estimates based on the existing situation and past experiences are made.

The measurement of certain assets and liabilities is based on estimates of uncertain future events. As a result of the uncertainties inherent in business activities, many financial statement items cannot be measured with precision but can only be estimated. Therefore, the management makes various estimates and assumptions of assets, liabilities, incomes and expenses as on the date of preparation of financial statements. Such estimates are made in connection with the computation of depreciation, amortisation and impairment losses as well as, accruals, provisions and employee benefit obligations. Also estimates may be required in determining the bad debts, useful life and residual value of an item of plant and machinery and inventory obsolescence. The process of estimation involves judgements based on the latest information available.

An estimate may require revision if changes occur regarding circumstances on which the estimate was based, or as a result of new information, more experience or subsequent developments. Change in accounting estimate means difference arises between certain parameters estimated earlier and re-estimated during the current period or actual result achieved during the current period.

Few examples of situations wherein accounting estimates are needed can be given as follows:

1. A company incurs expenditure of ₹ 10,00,000 on development of patent. Now the company has to estimate that for how many years the patent would benefit the company. This estimation should be based on the latest information and logical judgement.
2. A company dealing in long-term construction contracts, uses percentage of completion method for recognizing the revenue at the end of the accounting year. Under this method the company has to make adequate provisions for unseen contingencies, which can take place while executing the remaining portion of the contract. Since provisioning for unseen contingencies requires estimation, there may be excess or short provisioning, which is to be adjusted in the period when it is recognised.
3. A company has to provide for taxes which is also based on estimation as there can be some interpretational differences on account of which tax authorities may either accept the expenditure or refuse it. This will ultimately lead to different tax liability.
4. Company XY Ltd purchases a machine for ₹ 10 lac in 2021. The procurement head suggested that the machine is expected to offer benefits up to next 10 years. After 3 years of its use, the machine has become obsolete as new technologies are now available providing better productivity than the existing machine. Hence, it is now expected that the machine can only offer benefits for further 3 years. This is a change in estimate in the useful life of the machine.

## SUMMARY

- ◆ Measurement is vital aspect of accounting. Primarily transactions and events are measured in terms of money.
- ◆ There are three elements of measurement:
  - (i) Identification of objects and events to be measured;
  - (ii) Selection of standard or scale to be used;
  - (iii) Evaluation of dimension of measurement standard or scale.
- ◆ There are four generally accepted measurement bases or valuation principles. These are:
  - (i) Historical Cost;
  - (ii) Current Cost;
  - (ii) Realizable Value;
  - (iv) Present Value.

## TEST YOUR KNOWLEDGE

### True and False

1. *There are four generally accepted measurement bases.*
  - (i) *Historical Cost;*
  - (ii) *Current Cost;*
  - (iii) *Realizable Value;*
  - (iv) *Future Value.*
2. *Historical Cost means price paid at time acquisition.*
3. *As per future value, assets are carried at the amount of cash or cash equivalents that could currently be obtained by selling the assets in an orderly disposal.*
4. *At Present value, liabilities are carried at the value of future net cash outflows that are expected to be required to settle the liabilities in the normal course of business.*
5. *ABC purchased a machinery amounting ₹10,00,000 on 1st April, 2001. On 31st March, 2022, similar machinery could be purchased for ₹20,00,000. Historical cost of machine is 20,00,000*
6. *ABC purchased a machinery amounting ₹10,00,000 on 1st April, 2001. On 31st March, 2022, similar machinery could be purchased for ₹20,00,000. Current cost of machine is ₹ 20,00,000*
7. *Change in accounting estimate has to be given retrospective effect.*

### Multiple Choice Questions

1. (i) *Measurement discipline deals with*
  - (a) *Identification of objects and events.*
  - (b) *Selection of scale.*
  - (c) *Both (a) and (b)*
- (ii) *All of the following are valuation principles except*
  - (a) *Historical cost.*
  - (b) *Present value.*
  - (c) *Future value.*

- (iii) Book value of machinery on 31st March, 2022 ₹ 10,00,000  
Market value as on 31st March, 2022 if sold ₹ 11,00,000  
As on 31st March, 2022, if the company values the machinery at ₹ 11,00,000, which of the following valuation principle is being followed?
- (a) Historical Cost.
  - (b) Present Value.
  - (c) Realisable Value.
2. Mohan purchased a machinery amounting ₹ 10,00,000 on 1st April, 2001. On 31st March, 2022, similar machinery could be purchased for ₹ 20,00,000 but the realizable value of the machinery (purchased on 1.4.2001) was estimated at ₹ 15,00,000. The present discounted value of the future net cash inflows that the machinery was expected to generate in the normal course of business, was calculated as ₹ 12,00,000.
- (i) The current cost of the machinery is
    - (a) ₹ 10,00,000.
    - (b) ₹ 20,00,000.
    - (c) ₹ 15,00,000.
  - (ii) The present value of machinery is
    - (a) ₹ 10,00,000.
    - (b) ₹ 20,00,000.
    - (c) ₹ 12,00,000.
  - (iii) The historical cost of machinery is
    - (a) ₹ 10,00,000.
    - (b) ₹ 20,00,000.
    - (c) ₹ 15,00,000.
  - (iv) The realizable value of machinery is
    - (a) ₹ 10,00,000.
    - (b) ₹ 20,00,000.
    - (c) ₹ 15,00,000.

## Theoretical Questions

1. Define Measurement in brief. Explain the significant elements of measurement.
2. Describe in brief, the alternative measurement bases, for determining the value at which an element can be recognized in the balance sheet or statement of profit and loss.

## ANSWER/HINTS

### True and False

- False: There are four generally accepted measurement bases .  
 (i) Historical Cost;  
 (ii) Current Cost;  
 (iv) Realizable Value;  
 (iv) Present Value.
- True: Historical cost means the acquisition price.
- False: At Realisable value, assets are carried at the amount of cash or cash equivalents that could currently be obtained by selling the assets in an orderly disposal.
- False: Liabilities are carried at the present discounted value of future net cash outflows that are expected to be required to settle the liabilities in the normal course of business.
- False: Historical cost is ₹10,00,000.
- True: Since similar machine is purchased at 20,00,000, the current cost of machine is ₹ 20,00,000.
- False: Change in accounting estimate has not to be given retrospective effect.

### Multiple Choice Questions

|        |     |      |     |       |     |       |     |      |     |       |     |
|--------|-----|------|-----|-------|-----|-------|-----|------|-----|-------|-----|
| 1. (i) | (c) | (ii) | (c) | (iii) | (c) | 2.(i) | (b) | (ii) | (c) | (iii) | (a) |
| (iv)   | (c) |      |     |       |     |       |     |      |     |       |     |

### Theoretical Questions

- Measurement is vital aspect of accounting. Primarily transactions and events are measured in terms of money. Three elements of measurement are: (1) Identification of objects and events to be measured; (2) Selection of standard or scale to be used; (3) Evaluation of dimension of measurement standard or scale.
- Alternative measurement bases are: (i) Historical Cost; (ii) Current cost (iii) Realisable (Settlement) Value and (iv) Present Value. Refer para 6.6 for details.