

Progressive Education Society's

Modern College of Arts, Science and Commerce (Autonomous), Shivajinagar, Pune -5.

**F.Y.B.Com (Semester I)**

Subject: Business Mathematics and Statistics-I

**Notes and Sample Questions for Business Mathematics**

## 1 Important Short Notes

**Definition 1.1 Ratio:** If 'a' and 'b' are magnitudes of same kind, expressed in same units, then the quotient  $\frac{a}{b}$  is called the ratio of 'a' and 'b' and is denoted by  $a : b$ .

**Note:**

1. Ratio is a pure number. i.e. Ratio has no unit
2. In the ratio  $a : b$ , 'a' is called **antecedent** and 'b' is called **consequent**.
3. If we multiply the numerator and denominator in any ratio by the same (non-zero) number, the ratio remains the same.  
i.e.  $\frac{a}{b} = \frac{ma}{mb}$ ,  $m \neq 0$
4. In the ratio  $a : b$ , the antecedent and consequent may not be the actual quantities, so while solving the example the actual quantities can be taken as  $xa$  and  $xb$ , ( $x \neq 0$ ).

**Definition 1.2 Continued Ratio:** Continued ratio is the relation between the magnitudes of three or more quantities of the same kind. The continued ratio of the three similar quantities  $a, b, c$  is denoted by  $a:b:c$ .

**Definition 1.3 Proportion:** If two ratios are equal, then the four quantities given by them are said to be in proportion. Mathematically it can be expressed as, if the ratios  $a:b$  and  $c:d$  are equal, then  $a, b, c, d$  are said to be in proportion and it can be written as  $a:b::c:d$  i.e.  $\frac{a}{b} = \frac{c}{d}$ . 'a' and 'd' are called **extremes** and 'b' and 'c' are called **means**.

Note: If  $a, b, c, d$  are in proportion, then,

$$\frac{a}{b} = \frac{c}{d}$$

$$ad = bc$$

Product of extremes = Product of means

**Definition 1.4 Continued Proportion:** If  $a, b, c$  are three quantities of the same kind and if  $\frac{a}{b} = \frac{b}{c}$ , then the quantities  $a, b, c$  are said to be in continued proportion. If the quantities  $a, b, c$  are in continued proportion, then  $b$  is called mean proportional to  $a$  and  $c$  and  $b^2 = ac$

## 2 Profit and Loss

**Definition 2.1 Cost Price (C.P):** The total amount paid for purchasing an article, transport charges, GST etc. is called cost price of that article.

**Definition 2.2 Marked Price (M.P):** The price of an article which is printed in the price list or catalogue so as to ensure that the consumer gets the article at that price is called marked price or list price or catalogue price.

**Definition 2.3 Selling Price (S.P):** Total amount released by selling an article is called selling price of that article.

**Definition 2.4 Trade Discount:** Traders who buy goods in large quantities from manufacturers or wholesalers are given an allowance on the list price of the goods. This discount is known as the trade discount.

**Definition 2.5 Cash Discount:** The discount given by retailer to a purchaser is called cash discount.

Sometimes, a buyer may get benefit of both discounts. In such case, cash discount should be calculated on a net value of the goods after deducting trade discount.

**Definition 2.6 Profit:** If the selling price (S.P) is more than cost price (C.P), then the transaction is said to be profitable.

$$\text{Profit} = S.P - C.P$$

**Definition 2.7 Profit:** If the cost price (C.P) is more than selling price (S.P), then the transaction is said to be profitable.

$$\text{Loss} = C.P - S.P$$

Note:

1. Percentage profit or loss is always calculated on the C.P
2. Commission or discount is always given on S.P.
3. Percentage profit or loss does not depend on number of articles sold (or purchased).
4. If an article is sold at  $y\%$  **profit**, then its S. P. is given as
 
$$S.P. = \left( \frac{100 + y}{100} \right) C.P.$$
5. If an article is sold at  $y\%$  **loss**, then its S. P. is given as
 
$$S.P. = \left( \frac{100 - y}{100} \right) C.P.$$
6. If the dealer is earning  $x\%$  **profit** on giving  $y\%$  **discount**, then the market price (M.P) is given as
 
$$M.P. = \left( \frac{100 + x\%}{100 - y\%} \right) C.P.$$

### 3 Commission and Brokerage

Sale and purchase of various commodities is an important part of business and commerce. However, it is not possible always for the manufacturer to approach the customer directly. The goods should be distributed to traders/dealers and then to customers. Sometimes the goods are sold/distributed through the middleman called agents or brokers. To encourage the industrialization in rural areas, the process of distribution of commodities from manufacturer to rural areas is done by agents. They may be wholesalers, dealers, retailers, agents etc.

**Definition 3.1 Commission:** The remuneration paid by manufacturer to the agent is called commission. **Commission is always paid on selling price.**

The rate of commission can be fixed on the entire sale or it may vary after certain amount of sale or can be paid in the form of incentive. Sometimes, a fixed amount is also paid to the agent per month or per year.

**Definition 3.2 Brokerage:** The remuneration paid by seller as well as buyer to the agent is called brokerage.

For example, real estate deals, vehicle sale and purchase, selling and buying shares etc.

### 4 Interest

#### A. Simple interest:

$$S.I = \frac{Prn}{100}$$

where

$P$  = Principal Amount

$r$  = Rate of interest % per annum

$n$  = Term in years

$$\begin{aligned} \text{Total Amount} = A &= P + \frac{Prn}{100} \\ &= P \left( 1 + \frac{rn}{100} \right) \end{aligned}$$

**Note:** If the period is given in months, then first convert it into years dividing by 12.

**Example:** Find simple interest on Rs.2000 at 6%p.a for 8 months.

**Solution:**

$$P = 2000$$

$$r = 6\%p.a$$

$$n = 8 \text{ months} = \frac{8}{12} \text{ years}$$

$$\begin{aligned} S.I &= \frac{2000 \times 6 \times \left(\frac{8}{12}\right)}{100} \\ &= \frac{2000 \times 6 \times 8}{1200} \\ &= \frac{20 \times 6 \times 8}{12} \\ &= 80 \end{aligned}$$

**B. Compound Interest (C.I):**

$$\begin{aligned}
 \text{Total Amount} = A &= P \left(1 + \frac{r}{100}\right)^n \\
 \text{C.I} &= A - P \\
 &= P \left(1 + \frac{r}{100}\right)^n - P \\
 &= P \left(\left(1 + \frac{r}{100}\right)^n - 1\right)
 \end{aligned}$$

**Note:**

1. If compound interest is calculated **half yearly**, then

- Rate of interest per half year  $= r_1 = \frac{r}{2}$ , where  $r$  is rate of interest p.a
- Number of half years  $= n_1 = n \times 2$ , where  $n$  is given in number of years

**Example 4.1** Find the compound interest on Rs.15,000/- for 3 years at 9% p.a compounded half yearly.

Given:

$$P = 15,000$$

$$r = 9\% \text{ p.a} \quad \therefore \text{rate of interest per half year} = r_1 = \frac{9}{2} = 4.5\% \text{ per half year}$$

$$n = 3 \text{ years} \quad \therefore \text{number of half years in 3 years} = n_1 = 3 \times 2 = 6 \text{ half years}$$

$$\text{Total amount } A = P \left(1 + \frac{r_1}{100}\right)^{n_1} \quad (\text{formula})$$

$$= 15,000 \left(1 + \frac{4.5}{100}\right)^6$$

$$= 15,000 (1 + 0.045)^6$$

$$= 15,000 (1.045)^6$$

$$= 15,000 \times 1.3022$$

$$= 19,533.90$$

$$\therefore \text{Compound interest} = A - P = 19,533.90 - 15,000 = 4,533.90$$

2. If compound interest is calculated **quarterly**, then

- Rate of interest per quarter  $= r' = \frac{r}{4}$ , where  $r'$  is rate of interest p.a
- Number of quarters  $= n' = n \times 4$ , where  $n'$  is given in number of years

Consider the same example (4.1) for quarterly compound interest

**Example 4.2** Find the compound interest on Rs.15,000/- for 3 years at 9% p.a compounded quarterly.

Given:

$$P = 15,000$$

$$r = 9\% \text{ p.a.} \quad \therefore \text{rate of interest per half year} = r_1 = \frac{9}{4} = 2.25\% \text{ per quarter}$$

$$n = 3 \text{ years} \quad \therefore \text{number of quarters in 3 years} = n_1 = 3 \times 4 = 12 \text{ half years}$$

$$\text{Total amount } A = P \left(1 + \frac{r_1}{100}\right)^{n_1} \quad (\text{formula})$$

$$= 15,000 \left(1 + \frac{2.25}{100}\right)^{12}$$

$$= 15,000 (1 + 0.0225)^{12}$$

$$= 15,000 (1.0225)^{12}$$

$$= 15,000 \times 1.3060$$

$$= 19,590.74$$

$$\therefore \text{Compound interest} = A - P = 19,590.74 - 15,000 = 4,590.74$$

### C. Equated Monthly Instalments (EMI):

#### a) EMI on reducing balance:

$$P = \frac{x}{i} \{1 - (1+i)^{-n}\} = \frac{x}{i} \left\{1 - \frac{1}{(1+i)^n}\right\}$$

where

$P$  = Amount of loan or Fixed Deposit

$r$  = Rate of interest % per annum

$$i = \text{Rate of compound interest \% per month} = \left(\frac{r}{12}\right)\% = \left(\frac{r}{1200}\right)$$

$n$  = Number of instalments = Number of years  $\times 12$  = Total number of months of EMI

$x$  = Equated monthly installment

**Example 4.3** Find the EMI, if a loan of Rs.12,00,000/- at the rate 10% p.a is to be repaid in equal monthly instalments in 8 years. (Given:  $(1.00833)^{96} = 2.2175$ )

Given:

$$P = 12,00,000$$

$$r = 10\%$$

$$i = \text{Rate of compound interest \% per month} = \left(\frac{10}{12}\right)\% = \left(\frac{10}{1200}\right) = 0.00833$$

$$n = 8 \text{ years} = 8 \times 12 \text{ number of installments} = 96 \text{ months/installments}$$

$$P = \frac{x}{i} \{1 - (1+i)^{-n}\} = \frac{x}{i} \left\{1 - \frac{1}{(1+i)^n}\right\} \quad (\text{formula})$$



We have to find value of x here.

$$\Rightarrow 12,00,000 = \frac{x}{0.0083} \left\{ 1 - \frac{1}{(1 + 0.00833)^{96}} \right\}$$

$$\Rightarrow 12,00,000 = \frac{x}{0.0083} \left\{ 1 - \frac{1}{(1.00833)^{96}} \right\}$$

The value of  $(1.00833)^{96}$  is given in example. Substitute it in this calculation

$$\Rightarrow 12,00,000 = \frac{x}{0.0083} \left\{ 1 - \frac{1}{2.2175} \right\}$$

$$\Rightarrow 12,00,000 = \frac{x}{0.0083} \{1 - 0.45096\}$$

$$\Rightarrow 12,00,000 = \frac{x}{0.0083} (0.5490)$$

$$\Rightarrow 12,00,000 = x \times \frac{0.5490}{0.0083}$$

$$\Rightarrow 12,00,000 = x \times 65.9106$$

$$\Rightarrow \frac{12,00,000}{65.9106} = x$$

$$\Rightarrow 18,206.45 = x$$

The EMI is Rs.18,206.45/-

#### b) EMI on Flat rate of interest:

Step 1: Calculate the total amount by using formula:  $A = P \left( 1 + \frac{rn}{100} \right)$

Step 1: Calculate EMI using the formula:  $EMI = \frac{A}{K}$ , where  $K =$  The number of instalments

## 5 Shares and Dividends:

The big industry on large scale needs more capital. It is not possible for a single person. Several persons come together to raise required capital. These are called *promoters* of the company. The capital is divided into small parts called *shares*. The people who purchase shares are called *shareholders* of the company. They are indirect owners of the company. The company is managed by a body of persons known as *Board of Directors* of the company.

**Definition 5.1 Shares:** The total capital of the company is divided into a number of small unit of equal value, called 'shares'.

### 5.1 Types of Shares

Based on the amount of investment there are two main types of shares with subtypes.  
(Diagram)

#### 5.1.1 Preference Shares:

Preference share holders have the preferential rights regarding the payment of dividend as well as the repayment of capital in the event of winding-up. The rate of dividend is fixed but it is paid

before the profit is distributed to other share holders. The preference shares are of two the following:

**A] Cumulative preference shares:** The cumulative share holders are entitled to a fixed dividend every year. The dividend is paid before distributing it to other class of shareholders.. If in any case, the dividend can not be paid to these shareholders, it is considered as the arrears. These arrears are payable out of the profits of subsequent years.

**B] Non-Cumulative preference shares:** Non-Cumulative preference shareholders have a preferential right for a fixed dividend out of the profits. These shareholders also get the first priority at the time of distribution of dividend out of profits. But such dividend is payable only out of the profits of each particular year. If in any case, the dividend can not be paid to these shareholders, it lapses and can not be claimed out of future profits.

### 5.1.2 Equity Shares:

These types of shares are called 'ordinary shares'. These shares do not have any special rights. The dividend to these shareholders is paid after the claim of dividend for preference shareholders is satisfied. The rate of dividend is also not fixed. It varies from year to year depending on the profits of the company. These shareholders may or may not get the dividend every year. Also they have no right to claim the dividend.

## 5.2 Some other definitions

**Definition 5.2 Dividend:** *The net profit made by the company every year is determined from profit and loss account prepared at the end of the year.*

The dividend is paid first to preference share holders at the specified rate, then arrears on cumulative preference shares are paid, if the amount of profit permits. The the remaining balance of profit is then utilised for the dividend of equity share holders. Sometimes dividend may be declared as a fixed amount per share or as a percentage of the capital of the company.

**Definition 5.3 Debentures:** *Debentures are long term loans taken by the company from the public.*

A company requires more long term capital for the extension and development schemes. It can be raised in the form of debentures. The total amount to be borrowed is divided like share capital into small units of equal amounts. Then the investors are called to lend these amounts to the company at a specified rate of interest.

**Definition 5.4 Bonus Shares:** *The free shares rewarded by the company to the shareholders are called bonus shares.*

Bonus shares are entitled for all rights that an ordinary shares have. Bonus shares are issued in some ratio. The ratio **a:b** means 'a' free shares for 'b' shares held.

1. Face Value of share is the price stated on the body of share. We generally consider Rs.100 per share, if F.V is not given.
2. Number of shares =  $\frac{\text{Total investment}}{\text{Market price of share}}$
3. Dividend is calculated on total face value.  
Total Face value=Number of shares  $\times$  Face value per share
4. Brokerage is calculated on total investment

## 6 Examples for Practice

### 6.1 Chapter 1: Preliminaries

#### 6.1.1 Ratio, Proportion and Percentage

1. If 24% of  $x$  is 36, then find  $x$
2. What is 25% of 678?
3. What is  $\frac{5}{8}$  of 56?
4. If  $a : b = 4 : 7$  and  $b : c = 9 : 5$ , find  $a : c$ .
5. If  $x : y = 4 : 7$  and  $x = 72$ , then find  $y$ .
6. If  $a : b = 4 : 7$  and  $b : c = 9 : 5$ , find  $a : c$ .
7. Two numbers are in the ratio 7 : 9 and their sum is 192. Find the numbers.
8. The ages of three persons are in the ratio of 2 : 5 : 3. If the age of second person is 50, what is the age of others?
9. What is 40% of 260?
10. Find  $\frac{2}{3}$  of 564.
11. What is the fourth proportion of 6, 8, 15?
12. Ratio is a
  - a) Imaginary number
  - b) Pure number
  - c) Complex number
  - d) Integer
13. In the ratio  $a : b$ 
  - a)  $a$  is consequent
  - b)  $b$  is antecedent
  - c)  $a$  is antecedent
  - d)  $b$  is mean
14. If we multiply the numerator and denominator in any ratio by the same (non zero) number, then the ratio
  - a) becomes zero
  - b) changes
  - c) has negative value
  - d) remains same
15. Two numbers are in the ratio 5:8 and their sum is 182. Then the bigger number is
  - a) 4
  - b) 70
  - c) 112



- d) 115
16. If  $x : y = 3 : 7$  and  $x = 81$ , then  $y$  equals (a) 7  
(b) 27  
(c) 189  
(d) 65
17. Two numbers are in the ratio 7 : 8 and their sum is 195. The numbers are (a) 90, 105  
(b) 104, 91  
(c) 78, 117  
(d) 65, 130
18. Two numbers are in the ratio is 3:5 and their product is 135, then the numbers are  
a) 15,9  
b) 45,3  
c) 5,27  
d) 25,6
19. If the four numbers a,b,c and d are in proportion, then b and c are called  
a) Means  
b) Extremes  
c) Antecedent  
d) Consequent
20. If the four numbers a,b,c and d are in proportion, then a and d are called  
a) Means  
b) Extremes  
c) Antecedent  
d) Consequent
21. The numbers a,b and c are called in continued proportion if  
a)  $b^2 = ac$   
b)  $a = \frac{b}{c}$   
c)  $c^2 = ab$   
d)  $b = a + c$
22. The numbers a,b and c are in continued proportion, then b is called  
a) Mean proportional to a and c  
b) Extreme of a and c  
c) Average of a and c  
d) Consequent of a and c

23. The sum of present ages of three persons is 66 years. Five years ago their ages were in the ratio 4:6:7. Then their present ages are
- 17,23,26
  - 23, 12, 31
  - 35,21,14
  - 26, 20,20
24. The fourth proportion of 4, 9, 8 is
- 18
  - 12
  - 36
  - 32

### 6.1.2 Profit and Loss

- The cost price of a cell phone is Rs.25,000. For how much should it be marked so as to earn 20% profit after allowing 7 % trade discount?
- Explain 1) Trade discount 2) Cash discount
- Mr. Bajaj buys a fridge for Rs. 36,542. for how much should he sell so that there is a gain of 5%?
- A dealer bought a T.V set and music system for Rs.50,000/-. he sold T.V. set at a gain of 20% and music system at a loss of 10%. He gained 2% on the whole. Find the C.P of T.V. set.
- A man purchased an item at Rs.18,000 and sold it at Rs. 14,500 after 2 years. Find the percentage of loss.
- A trader allows trade discount at 25% off the list price and further 5% for cash. How much an article costing Rs.450/-, he should mark, so as to release net profit of 14% on the cost?
- By selling two machines at Rs.19,875 each a trader gained 12% on one machine and lost 10% on the other machine. What is the percentage of gain or loss on total transaction?
- An article is sold for Rs.657 after allowing a trade discount of 20% and subsequently a cash discount of 5%. Find the catalogue price of the article.
- A scooter is sold for Rs. 6,500 at 9% loss, then the cost price of scooter was
  - Rs. 8,000/-
  - Rs. 7,142.85/-
  - Rs. 8024.69/-
  - Rs. 5,478.47/-
- An article costing Rs. 890 was sold at Rs. 950, then the percentage profit is
  - 5.2%
  - 6.74%
  - 7.85%

d) 10%

### 6.1.3 Commission and Brokerage

1. Ajay receives 5% commission on the sale upto Rs. 1,50,000 and 7% commission on the sales over Rs.1,50,000. Find the total commission on the sales of Rs.5,52,500.
  2. A car was bought for Rs. 86,000/- and sold for Rs.92,000/- through a broker who charges commission of 2% on purchase and 3% on sales. Find the total gain on the transactions.
  3. An agent was paid Rs.19,440/- as commission on the sale of T.V. sets. If the rate of commission was 12% and price of each set is Rs. 10,800/-. How many sets did he sell?
  4. Explain the terms: Commission and Brokerage.
  5. Commission is always given on
    - a) Selling price
    - b) Cost price
    - c) Market price
    - d) Catalogue price
  6. Commission received by a salesman on total sales of Rs. 30,000 at the rate of 12% is
    - a) 3,000/-
    - b) 3,500/-
    - c) 3,600/-
    - d) 1,200/-
  7. Commission is
    - a) the remuneration paid by commission agent
    - b) the remuneration paid by manufacturer
    - c) the cost paid by customer
    - d) the discount given by shopkeeper
  8. Brokerage is the amount paid to agent by
    - a) seller only
    - b) buyer only
    - c) seller and buyer
    - d) trader only
- Ans:

## 6.2 Chapter 2: Interest

1. Find the simple interest on Rs. 6000 at 10% p.a. for 10 months.
2. Find the effective rate of interest corresponding to a nominal rate 3% p.a. payable (a) half yearly (b) quarterly.
3. Find the simple interest on Rs. 1500 at 8% p.a. for 4 years.

4. Find the compound interest on Rs. 10,000 for 4 years at 8% p.a. **compounded quarterly**.  
(Here  $r = \frac{8}{4}\% = 2\%$  per quarter and  $n = 4 \times 4 = 16$  quarters)
5. Find the simple interest on Rs.6000 at 10% p.a for 10 months simple interest?
6. What sum will amount to Rs. 12167 in 5 years at 4% p.a. compound interest?
7. Find the compound interest on Rs. 9,000 for 2 years at 10% p.a. **compounded half yearly**.  
(Here  $r = \frac{10}{2}\% = 5\%$  per half year and  $n = 2 \times 2 = 4$  half years)
8. A sum of money doubles itself in 6 years. Find the rate of simple interest?
9. Find the simple interest on Rs. 8000 for 9 months at 4%?
10. The simple interest on Rs. 1900 for 4 years exceeds the simple interest on Rs. 1200 for the same period by Rs. 308. Find the rate of interest
11. The simple interest on Rs. 1500 at 8 % p.a. for 4 years is
  - a) 240
  - b) 1440
  - c) 480
  - d) 1452
12. Simple interest of Rs. 4,500 at the rate of 8% p.a. for 3 years is
  - a) Rs. 1,080
  - b) Rs. 1,00
  - c) Rs. 108
  - d) Rs. 360
13. Simple interest of Rs. 3,850 at the rate of 10% p.a. for 9 months is
  - a) Rs. 300
  - b) Rs. 385.36
  - c) Rs. 288.75
  - d) Rs. 19.76
14. A person borrows Rs. 15,000 for 6 years at 11.5% p.a. The total amount he has to pay
  - a) Rs. 6,584.36
  - b) Rs. 10,350
  - c) Rs.25,350
  - d) Rs. 15,350
15. What sum will amount to Rs. 8,280 in 6 months at 7% p.a. at simple interest?
  - a) Rs. 900
  - b) Rs. 8,000
  - c) Rs. 6,500
  - d) Rs. 3,450

16. A sum of money doubles itself in 10 years. The rate of simple interest
- 9% p.a.
  - 10% p.a.
  - 11% p.a.
  - 12% p.a.
17. Rs. 6,500 earns simple interest of Rs. 5,200 at 8% p.a. in the period of
- 8 years
  - 9 years
  - 10 years
  - 11 years
18. Which of the following relation is true for the same sum for one year?
- Simple interest is greater than compound interest
  - Simple interest is less than compound interest
  - Simple interest and compound interest is zero
  - Simple interest is same as compound interest
19. Which of the following relation is true for the same sum for same period and rate of interest?
- Simple interest is greater than or equal to compound interest
  - Simple interest is less than or equal to compound interest
  - Simple interest is greater than compound interest
  - Simple interest is same as compound interest
20. What is total amount of Rs. 4,500 at 12% p.a. in 2 years at compound interest?
- Rs. 5,644.8
  - Rs. 1,144.8
  - Rs. 1259.54
  - Rs. 965.45
21. The amount of Rs. 3,600 at 12% p.a. in 2 years compounded half yearly is
- Rs. 4,544.91
  - Rs. 2,137.85
  - Rs. 3645.21
  - Rs. 5,737.85
22. The difference between simple interest and compound interest on Rs. 68,000 at 12.5% p.a. for one year is
- Rs. 25.69/-
  - Rs. 0/-
  - Rs. 654.16/-
  - Rs. 14.78/-



23. The rate of interest is  $r\%$  p.a. for compound interest on the sum  $P$  for  $n$  years, then the rate of interest compounded quarterly is  
a)  $r\%$  per quarter b)  $r/4\%$  per quarter. c)  $4r\%$  per quarter d)  $r/2\%$  per quarter
24. The rate of interest is  $r\%$  p.a. for compound interest on the sum  $P$  for  $n$  years, then the rate of interest, compounded half yearly is  
a)  $r\%$  per quarter b)  $r/4\%$  per quarter. c)  $4r\%$  per quarter d)  $r/2\%$  per quarter
25. What value of  $n$  should be taken to calculate the compound interest on Rs.50,000 at  $10\%$  p.a. for 8 years, compounded quarterly?  
a) 8  
b) 24  
c) 16  
d) 32
26. What value of  $n$  should be taken to calculate the compound interest on Rs.4,800 at  $6\%$  p.a. for 5 years, compounded half yearly?  
a) 6  
b) 10  
c) 12  
d) 5
27. If the rate of interest is  $10.5\%$  then what is the effective rate of interest if compounding done quarterly?  
a)  $0.5\%$   
b)  $2.625\%$   
c)  $10.92\%$   
d)  $10\%$
28. If the rate of interest is  $12\%$  then what is the effective rate of interest if compounding done half yearly?  
a)  $6\%$   
b)  $12.36\%$   
c)  $12\%$   
d)  $12.5\%$
29. How many instalments will be there to repay the loan of Rs.12,00,000/- for the period of 14 years at  $11.5\%$ ? a) 168  
b) 7  
c) 28  
d) 14
30. Find the compound interest on Rs. 7500 for 2 years at  $9\%$  p.a. compounded half yearly.
31. Find the simple interest on Rs.30,000 at  $6\%$  p.a for 8 months simple interest?

32. What is the compound interest on Rs.12000 at 9% for 3 years?
33. Find the EMI on a loan Rs. 67,000/- at the rate 10% p.a. (flat rate of interest) is to be repaid in equal monthly instalments in 7 years.
34. Find the EMI on a loan of Rs. 2,00,000 at the rate 12% p.a. (reducing balance) is to be repaid in equal monthly instalments in 5 years. (Use  $(1.01)^{-60} = 0.5503$ )
35. Find the rate of interest p.a. if Rs. 200000 amount to Rs. 231525 in  $1\frac{1}{2}$  years interest compounded half yearly.
36. Find the compound interest on Rs. 5500 for 2 years at 12% p.a. compounded quarterly.
37. Find the difference between compound interest and simple interest on 4,000 for 2 years at 10% p.a (Compounded yearly)
38. Find the EMI on a loan of Rs. 25000 at the rate 5% p.a. (reducing balance) is to be repaid in equal monthly instalments in 4 years. (Use  $(1.0041)^{-48} = 0.819$ )
39. The difference between the simple and compound interest on a certain sum of money for 4 years at 6% p.a. is Rs. 168.75. What is the sum?
40. Find the EMI on a loan Rs. 5,50,000 at the rate 12% p.a. (flat rate of interest) is to be repaid in equal monthly instalments in 5 years.

### 6.3 Chapter: Shares and Dividends

1. A man invested Rs. 7000 in 8% shares at 140. How much dividend will he get? How much per cent of dividend does he get on his investment?
2. A man invested in 15% shares at 135 and 17% shares at 124. Which investment is more profitable?
3. A man invested Rs. 2000 in 10% at 125 and Rs. 2400 in 15% at 120. What will be his total income?
4. Explain the term 'Preference shares.
5. Mr. Bansal invested Rs. 13,568 in 7% shares at 106 and Rs. 12,648 in 11% shares at 124. How much income would he get in all?
6. Two companies have shares of 12% at 124 and 16% at 145. In which of the shares would the investment be more profitable?
7. Explain: (a) Dividend (b) Bonus shares
8. Two companies have shares of 20% at 180 and 25% at 250. In which of the shares would the investment be more profitable?
9. A man purchased shares of face value Rs. 3,200 by investing Rs. 4,000. What was the market price of the share? If the shares fetched 7% dividend, what percentage of dividend did he get on his investment?
10. A man invested Rs. 6200 in 6% shares at 124. How much dividend will he get? How much per cent of dividend does he get on his investment?

11. Dividend earned on investment of Rs. 13,568/- in 7% shares at Rs.106/- is
- a) Rs.128/-
  - b) Rs.896/-
  - c) Rs.259/-
  - d) Rs. 357/-
12. Two companies have shares Rs.80/- in 8% and Rs.120/- in 15%. Which one is better investment?
- a) Rs.80/- in 8%
  - b) Rs.120/- in 15%
  - c) Both shares
  - d) Can not say anything
13. A man invested Rs. 7,424 in 6% shares at 128, what will be the face value of shares?
- a) Rs. 5,800
  - b) Rs. 12,800
  - c) Rs. 7,400
  - d) Rs. 15,800