

## 1. Objectives

At the end of this unit , students will be able to:

- Solve the simple problems of unitary method
- Know the direct and indirect variations

## 2. Materials

- Chart or flash

## 3. Key points

- the rule of computing the values of more or less units by finding the value of a single unit of an object , work amount etc on the basis of given information is know as **Unitary Method**.
- In the two quantities , if one quantity increases then another quantity also increase in the same ratio and if one quantity decreases other also decreases in the same ratio then the two quantities are in direct variations.
- In the two quantities, if one quantity increases then another quantity decreases in same ratio and if one quantity decreases than another quantity increases in the same ratio then the two quantities are in indirect variations.

## 4. Examples

- a. If 12 workers can do a piece of work in 20 days. How many workers should be added to complete the work in 16 days?

Solution,

Here, In 20 days, the whole work is finished by 12 workers.

In 1 day, the whole work is finished by  $12 \times 20$  workers.

In 16 days, the whole work is finished by  $\frac{12 \times 20}{16} = 15$  workers.

$$\therefore \text{Number of additional workers} = 15 - 12 \\ = 3 \text{ workers.}$$

- b. If 9 pumps can pump 425 L of waters in 10 minutes, how many liters of water will be pumped by 6 pumps in 12 minutes?

Solution,

Here, 9 pumps in 10 minutes can pump 425 L. of water.

1 pump in 10 minutes can pump  $\frac{425}{9}$  L. of water.

1 pump in 1 minute can pump  $\frac{425}{9 \times 10}$  L. of water.

6 pumps in 1 minute can pump  $\frac{425 \times 6}{9 \times 10}$  L. of water.

6 pumps in 12 minutes can pump  $\frac{425 \times 6 \times 12}{9 \times 10} = 340$  L. of water

$$\therefore 6 \text{ pumps can pump } 340 \text{ L. of water in } 12 \text{ minutes.}$$

## 5. Homework

- a. 30 men can dig a well in 4 days. How many men should be added to dig it in 3 days.
- b. If 25 men can do a piece of work in 24 days working 9 hours per day, in how many days will 90 men can do the work working 6 hours per day?
- c. The cost of 3 tables is same as the cost of 4 chairs. If the cost of one table is Rs 1200, find the cost of a chair.
- d. 40 men can do a work in 32 days, how many men should be reduced to finish the work in 40 days.

## 1. Objectives

At the end of this unit , students will be able to:

- Solve the practical problems related to simple interest

## 2. Materials

- Chart paper / flash cards
- Exchanging activities

## 3. Key points

Interest = after borrowing or taking money from someone, if it is returned with additional amount within fixed period of time then this additional amount is called interest. It is denoted by 'I'.

Principal = The amount lending, borrowing or depositing in bank is called principal. it is denoted by 'P'.

Amount = The sum of principal and the interest is called amount. It is denoted by 'A'.

## 4. Formulae

$$\bullet \quad I = \frac{PTR}{100}$$

$$\bullet \quad A = P + I$$

$$\bullet \quad P = \frac{IX100}{T \times R}$$

$$\bullet \quad P = A - I$$

$$\bullet \quad R = \frac{IX100}{T \times P}$$

$$\bullet \quad I = A - P$$

$$\bullet \quad T = \frac{IX100}{P \times R}$$

$$\bullet \quad P = \frac{A \times 100}{100 + T \times R}$$

## 5. Examples

- a. How long will the sum of Rs 5000 amount to Rs 8750 at the rate of 7.5% per annum?

Solution,

Time (T) = ?

Principal (P) = Rs 5000

Amount (A) = Rs 8750

Rate (R) = 7.5%

We know,  $I = A - P$

$$= 8750 - 5000$$

$$= \text{Rs } 3750$$

$$\begin{aligned} \text{Again, } T &= \frac{I \times 100}{P \times R} \\ &= \frac{3750 \times 100}{5000 \times 7.5} \\ &= 10 \text{ years} \end{aligned}$$

∴ Hence required time (T) = 10 years.

- b. Ram deposits Rs 5000 in a bank for 2 years at the rate of 8% per annum. If he has to pay 5% of interest yields as the income tax, how much does he get after 2 years?

Solution,

Principal (P) = Rs 5000

Time (T) = 2 years

Rate (R) = 8%

Amount (A) = ?

$$\text{We know, } I = \frac{PTR}{100} = \frac{5000 \times 2 \times 8}{100} = \text{Rs } 800$$

Now,

Income tax = 5 % of 800 = Rs 40

Net interest = 800 - 40 = Rs 760

Again Amount (A) = P + Net interest = 5000 + 760 = Rs 5760

Hence Ram got Rs 5760 at the end of 2 years.

6. Homework

- a. Find the principal if interest in 5 years with 5% per annum is Rs 750.
- b. How much balance we have to deposit to get Rs 4200 interest in 7 years by 6% interest rate per annum?
- c. The sum of money amounts to Rs 2400 in 2 years and Rs 2600 in 3 years. Find the principal and interest rate.
- d. In how many years the sum of Rs 5000 amount to Rs 8750 at the rate of 15% per annum?