

Profit, Loss and Discount

- The price at which an article is bought is called its **cost price** (CP).
- The price at which an article is sold is its **selling price** (SP).
 - Conditions of profit or loss:
 1. If $CP < SP$ then profit is made and $\text{Profit} = SP - CP$
 2. If $CP = SP$ then there is a no profit, no loss.
 3. If $CP > SP$ then loss is incurred and $\text{Loss} = CP - SP$

For example, Suman bought a bottle for Rs 130 and sold it for Rs 142.

Here, $SP = \text{Rs } 142$, $CP = \text{Rs } 130$

As $SP > CP$, so profit is incurred.

$\text{Profit} = SP - CP = \text{Rs } 142 - \text{Rs } 130 = \text{Rs } 12$

- The formulae to calculate profit and loss are:

- $\text{Profit \%} = \frac{\text{Profit}}{\text{C.P.}} \times 100$

- $\text{Loss \%} = \frac{\text{Loss}}{\text{C.P.}} \times 100$

Example:

A shopkeeper purchased 15 dozen cups for Rs 900. However, 9 cups cracked during transportation. The remaining cups were sold for Rs 9 each. Find the gain or loss percent.

Solution:

Cost price of 15 dozen i.e., 180 cups = Rs 900

9 cups were cracked. Therefore, number of cups left = $180 - 9 = 171$

These 171 cups were sold at Rs 9 each.

$$\therefore \text{S.P. of 171 cups} = \text{Rs } 9 \times 171 = \text{Rs } 1539$$

$$\Rightarrow \text{Profit} = \text{SP} - \text{CP} = \text{Rs } (1539 - 900) = \text{Rs } 639$$

$$\text{Profit\%} = \frac{\text{Profit}}{\text{C.P.}} \times 100 = \frac{639}{900} \times 100 = 71\%$$

- Discount is the reduction given on the Marked Price (M.P) of an article.

$$\text{Discount} = \text{Marked Price} - \text{Sale price}$$

$$\text{Discount} = \text{Discount \% of Marked Price}$$

- If the successive discount %, $d_1\%$, $d_2\%$, $d_3\%$... are given, then

$$\text{S.P.} = \text{M.P.} \times \left(\frac{100 - d_1}{100} \right) \times \left(\frac{100 - d_2}{100} \right) \times \left(\frac{100 - d_3}{100} \right) \times \dots$$

Example:

For the stock sale at the end of a season, a garment shop offers 50% and then 40% on the garments. What is the marked price of a shirt if the shop offers a total discount of Rs 840 after giving two successive discounts?

Solution:

Let the marked price of the shirt be Rs x .

In two successive discounts, $d_1\% = 50$ and $d_2\% = 40$.

We know that

$$\begin{aligned} \text{S.P.} &= \left(\frac{100 - d_1}{100} \right) \times \left(\frac{100 - d_2}{100} \right) \times \text{M.P.} \\ &= \left(\frac{100 - 50}{100} \right) \times \left(\frac{100 - 40}{100} \right) \times x \\ &= \frac{50}{100} \times \frac{60}{100} \times x \\ &= \frac{3x}{10} \end{aligned}$$

We know that, discount = M.P. – S.P.

$$\Rightarrow 840 = x - \frac{3x}{10}$$

$$\Rightarrow \frac{7x}{10} = 840$$

$$\Rightarrow x = \frac{840 \times 10}{7} = 1200$$

Hence, the marked price of the shirt is Rs 1200.