
**Cost Price (C.P.):** Price at which at an article is purchased.

**Selling Price (S.P.):** Price at which at an article is sold

**Profit/Gain:** The seller is said to be in profit, if selling price (S.P.) is greater than cost price (C.P.)

**Loss:** The seller is said to be in loss, if selling price (S.P.) is lesser than cost price (C.P.)

**Important Formulae:**

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

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

3) When shopkeeper earns profit,

$$\text{Cost Price} = \frac{100}{(100 + \text{Gain\%})} \times \text{S.P.} \text{ - - - - - - (Given: Gain\% and selling price of an article)}$$

$$\text{Selling Price} = \frac{(100 + \text{Gain\%})}{100} \times \text{C.P.} \text{ - - - - - - (Given: Gain\% and cost price of an article)}$$

4) When shopkeeper incurs loss,

$$\text{Cost Price} = \frac{100}{(100 - \text{Loss\%})} \times \text{S.P.} \text{ - - - - - - (Given: Loss\% and selling price of an article)}$$

$$\text{Selling Price} = \frac{(100 - \text{Loss\%})}{100} \times \text{C.P.} \text{ - - - - - - (Given: Loss\% and cost price of an article)}$$

**Quick Tips and Tricks**

**1) Profit =** (S.P.) > (C.P.)

**2) Loss =** (S.P.) < (C.P.)

**3)** If profit earned by selling an article is 25 %, then S.P. = 125% of C.P.

**4)** If an article is sold at a loss of 30 %, then S.P. = 70 % of C.P.

**5)** A shopkeeper sells two similar items A and B. If A is sold at a gain of x % and B is sold at a loss of x %, then shopkeeper always incurs a loss given by:

$$\text{Loss\%} = \left[ \frac{\text{Common loss and gain\%}}{10} \right]^2 = \left[ \frac{x}{10} \right]^2$$

**6)** A trader sells goods at cost price but uses a weight of **x kg instead of y kg** (false weights) and makes profit. This profit can be calculated using the formula shown below:

**True weight – False weight = Error**

$$\text{Gain\%} = \left[ \frac{\text{Error}}{(\text{True weight} - \text{Error})} \times 100 \right] \%$$

**7)** If cost price of X articles is equal to selling price of Y articles, then profit can be calculated using the formula:

a) C.P. of X = S.P. of Y

b) Number of X articles > Number of Y articles

$$\text{Profit\%} = \frac{\text{No. of X articles} - \text{No. of Y articles}}{\text{No. of Y articles}} \times 100$$

**8)** If a seller makes X % above C.P. and offers a discount of Y%, then profit % or loss % can be calculated using the formula:

$$\text{Profit or Loss\%} = (X - Y) - \frac{X \times Y}{100}$$

9) Discount:

$$\text{a) Discount\%} = \frac{\text{Discount}}{\text{Marked Price (M.P.)}} \times 100$$

b) If D1, D2, D3 are percentage of successive discounts on M.P., then S.P.

$$= \text{Marked Price} \left(1 - \frac{D_1}{100}\right)\left(1 - \frac{D_2}{100}\right)\left(1 - \frac{D_3}{100}\right)$$

c) If a and b are two successive discount percentages, then single equivalent discount percentage is given as:

$$\text{Single equivalent discount percentage} = \left[ (a + b) - \frac{ab}{100} \right]$$