Pofit and Loss

INTRODUCTION

Cost Price

The amount paid to purchase an article or the price at which an article is made, is known as its cost price.

The cost price is abbreviated as C.P.

Selling Price

The price at which an article is sold, is known as its selling price.

The selling price is abbreviated as S.P.

Profit

If the selling price (S.P.) of an article is greater than the cost price (C.P.), then the difference between the selling price and cost price is called profit.

Thus, If S.P. > C.P., then

Profit = S.P. – C.P.

$\Rightarrow$ S.P. = C.P. + Profit

$\Rightarrow$ C.P. = S.P. – Profit.

Loss

If the selling price (S.P.) of an article is less than the cost price (C.P.), then the difference between the cost price (C.P.) and the selling price (S.P.) is called loss.

Thus, if S.P. < C.P., then

Loss = C.P. – S.P.

$\Rightarrow$ C.P. = S.P. + Loss

$\Rightarrow$ S.P. = C.P. – Loss

Profit and Loss percentage

The profit per cent is the profit that would be obtained for a C.P. of ₹ 100. Similarly, the loss per cent is the loss that would be made for a C.P. of ₹ 100.

$$\text{Profit per cent} = \frac{\text{Profit}}{\text{C.P.}} \times 100$$

$$\text{Loss per cent} = \frac{\text{Loss}}{\text{C.P.}} \times 100$$

✎ REMEMBER

★ $\text{Profit} = \dfrac{\text{C.P.} \times \text{Profit \%}}{100}$

★ $\text{Loss} = \dfrac{\text{C.P.} \times \text{Loss \%}}{100}$

★ $\text{S.P.} = \left(\dfrac{100 + \text{Profit\%}}{100} \right) \times \text{C.P.}$

★ $\text{S.P.} = \left(\dfrac{100 - \text{Loss\%}}{100} \right) \times \text{C.P.}$

★ $\text{C.P.} = \dfrac{100 \times \text{S.P.}}{100 + \text{Profit \%}}$

★ $\text{C.P.} = \dfrac{100 \times \text{S.P.}}{100 - \text{Loss \%}}$

NOTE

(i) If an article is sold at a certain gain (say 45%), then SP = 145% of CP

(ii) If an article is sold at certain loss (say 25%), then SP = 75% of CP.

☞ *Shortcut Approach*

Dishonest dealing:

$$\text{Gain \%} = \frac{\text{Error}}{\text{True value} - \text{Error}} \times 100$$

$$\frac{\text{True Scale}}{\text{False Scale}} = \frac{100 + \text{gain\%}}{100 - \text{loss\%}}$$

☞ *Shortcut Approach*

Real Profit/Loss percentage :

If the profit or loss is calculated on S.P., then it is not actual profit or loss.

Real profit (loss)% is the profit (loss)% on C.P.

$$\text{Real Profit \%} = \frac{\text{\% profit on S.P.}}{100 - \text{\% profit on S.P.}} \times 100$$

☞ *Shortcut Approach*

↷ **Goods passing through successive hands**

- When there are two successive profits of a% and b%, then the resultant profit per cent is given by

$$\left(a + b + \frac{ab}{100}\right)\%$$

- When there are two successive loss of a% and b%, then the resultant loss per cent is given by $\left(-a - b + \frac{ab}{100}\right)\%$

- When there is a profit of a% and loss by b% in a transaction, then the resultant profit or loss per cent is given by

$\left(a - b - \frac{ab}{100}\right)\%$, according to the +ve or −ve sign respectively.

See Example : Refer ebook Solved Examples/Ch-6

☞ When cost price and selling price are reduced by the same amount (A) and profit increases then cost price (C.P.)

$$= \frac{[\text{Initial profit\%} + \text{Increase in profit\%}] \times A}{\text{Increase in profit\%}}$$

☞ *Shortcut Approach*

☞ If cost price of x articles is equal to the selling price of y articles, then profit/loss percentage $= \frac{x-y}{y} \times 100\%$, according to +ve or –ve sign respectively.

☞ A man purchases a certain number of articles at x a rupee and the same number at y rupee. He mixes them together and sells them at z rupee. Then his gain or loss %

$$= \left[\frac{2xy}{z(x+y)} - 1\right] \times 100 \text{ according as the sign is +ve or –ve.}$$

☞ If two items are sold, each at ₹. x, one at a gain of p% and the other at a loss of p%, there is an overall loss given by $\frac{p^2}{100}$%. The absolute value of the loss is given by $\frac{2p^2 x}{100^2 - p^2}$.

☞ If CP of two items is the same and % Loss and % Gain on the two items are equal, then net loss or net profit is zero.

See Example : Refer ebook Solved Examples/Ch-6

☞ **Shortcut Approach**

⇨ A businessman sells his items at a profit/loss of a%. If he had sold it for ₹ R more, he would have gained/lost b%. Then,

CP of items = $\dfrac{R}{b \pm a} \times 100$

'–' = When both are either profit or loss

'+' = When one is profit and other is loss

⇨ If A sold an article to B at a profit (loss) of r_1 % and B sold this article to C at a profit (loss) of r_2 %, then cost price of article for C

is given by (cost price for A) × $\left(1 \pm \dfrac{r_1}{100}\right)\left(1 \pm \dfrac{r_2}{100}\right)$.

⇨ If a man purchases m items for ₹ x and sells n items for ₹ y, then

Profit or loss per cent is given by $\dfrac{my - nx}{nx} \times 100\%$

⇨ [Positive result means profit and negative result means loss].

See Example : Refer ebook Solved Examples/Ch-6

Marked Price

The price on the lable is called the marked price or list price.

The marked price is abbreviated as M.P.

Discount

The reduction made on the 'marked price' of an article is called the discount.

NOTE : *When no discount is given, 'selling price' is the same as 'marked price'.*

- Discount = Marked price × Rate of discount.

- S.P. = M.P. – Discount.

- Discount % = $\dfrac{\text{Discount}}{\text{M.P.}} \times 100$.

- Buy x get y free i.e., if x + y articles are sold at cost price of x articles, then the percentage discount = $\dfrac{y}{x + y} \times 100$.

✍ REMEMBER

★ In **successive discounts**, first discount is subtracted from the marked price to get net price after the first discount. Taking this price as the new marked price, the second discount is calculated and it is subtracted from it to get net price after the second discount. Continuing in this manner, we finally obtain the final selling price.

In case of successive discounts a% and b%, the effective discount

is $\left(a + b - \dfrac{ab}{100} \right)\%$

NOTE : *If the list price of an item is given and discounts d_1 and d_2 are given succesively on it then,*

Final price = list price $\left(1 - \dfrac{d_1}{100} \right)\left(1 - \dfrac{d_2}{100} \right)$

SALES TAX

To meet government's expenditures like construction of roads, railway, hospitals, schools etc. the government imposes different types of taxes. Sales tax (S.T.) is one of these tax.

Sales tax is calculated on selling price (S.P.)

NOTE : *If discount is given, selling price is calculated first and then sales tax is calculated on the selling price of the article.*

☞ *Shortcut Approach*

↗ If 'a'th part of some items is sold at x% loss, then required gain per cent in selling rest of the items in order that there is neither

gain nor loss in whole transaction, is $\dfrac{ax}{1-a}\%$

See Example : Refer ebook Solved Examples/Ch-6