**PROFIT AND LOSS**

| Cost Price (CP) | It is the price at which a thing /object is **purchased**. |
|---|---|
| Selling Price (SP) | It is the price at which a thing / object is **sold**. |

**Profit / Gain and Loss**

| If SP>CP | Gain = SP-CP | Gain Percentage= (Gain * 100) / CP | Seller has profit / Gain. |
|---|---|---|---|
| If SP<CP | Loss= CP-SP | Loss Percentage= (Loss * 100) / CP | Seller has loss. |

**Selling Price (SP) and Cost Price (CP)**

| Selling Price= ((100 + Gain %)/100) * CP | Selling Price= ((100 - Loss %)/100) * CP |
|---|---|
| Cost Price = (100/ (100 + Gain %)) * SP | Cost Price = = (100/ (100 - Loss %)) * SP |

**Note**
1. If gain of sold article is 40%, then SP= 140% of C.P.
2. If loss of sold article is 40%, then SP= 60% of C.P.
3. When a person sells 2 similar items, 1 for gain of x% and other for loss of x%, then the seller always incurs a loss. Loss % = (Common Loss & Gain %) $^2$ = x 2.
4. If a trader use false weights to sell his goods at cost price, then
**Gain Percentage= ((Error/ (True Value- Error))* 100) %**


**Problems with solutions**

1. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

**Solution**
Let C.P. of each article be Re. 1 C.P. of x articles = Rs. x.
S.P. of x articles = Rs. 20.
Profit = Rs. (20 - x).

$$\frac{20 - x}{x} \times 100 = 25$$

2000 - 100x = 25x

125x = 2000

x = 16


2. A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?

**Solution**

C.P. of 6 toffees = Re. 1

S.P. of 6 toffees = 120% of Re. 1 = Rs. $\dfrac{6}{5}$

For Rs. $\dfrac{6}{5}$ , toffees sold = 6.

For Re. 1, toffees sold = 6 x $\dfrac{5}{6}$ = 5.

3. A shopkeeper expects a gain of 22.5% on his cost price. If in a week, his sale was of Rs. 392, what was his profit?

**Solution**

C.P. = Rs. $\dfrac{100}{122.5}$ x 392 = Rs. $\dfrac{1000}{1225}$ x 392 = Rs. 320

Profit = Rs. (392 - 320) = Rs. 72.

4. Sam purchased 20 dozens of toys at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit?
**Solution**

Cost Price of 1 toy = Rs. $\dfrac{375}{12}$ = Rs. 31.25

Selling Price of 1 toy = Rs. 33

So, Gain = Rs. (33 - 31.25) = Rs. 1.75

Profit % = $\dfrac{1.75}{31.25}$ x 100 % = $\dfrac{28}{5}$% = 5.6%

5. Some articles were bought at 6 articles for Rs. 5 and sold at 5 articles for Rs. 6. Gain percent is:

**Solution**

Suppose, number of articles bought = L.C.M. of 6 and 5 = 30.

C.P. of 30 articles = Rs. $\dfrac{5}{6}$ x 30 = Rs. 25.

S.P. of 30 articles = Rs. $\dfrac{6}{5}$ x 30 = Rs. 36.

Gain % = $\dfrac{11}{25}$ x 100% = 44%.