PROFIT & LOSS

Cost Price	**:**	**The price at an item is purchased is called C.P**
Selling Price	**:**	**The price at an item is sold is called S.P**
Profit (or) Gain	**:**	**If S.P is greater than C.P then we get Profit.**
Loss	**:**	**If C.P is greater than S.P then we get Loss.**
M.R.P	**:**	**The maximum price above which that no product will be sold.**

S.P – C.P = Profit

C.P – S.P = Loss

E.g. If C.P of Mobile is 10K

If S.P of Mobile is 12K

Profit = 12k – 10k ➜ 2k (**2,000**)

E.g. If C.P of T.V is 20 K

If S.P of T.V is 15 K

Loss = 20k – 15k ➜ 5k (5000)

$$Profit\ \% = \frac{(S.P - C.P)}{C.P} * 100$$

$$\frac{S.P}{C.P} = \frac{(100 + P\%)}{100}$$

$$Loss\ \% = \frac{(C.P - S.P)}{C.P} * 100$$

$$\frac{S.P}{C.P} = \frac{(100 - L\%)}{100}$$

- ## If a dishonest seller sells his goods at cost price but using false weight then Gain (or) Profit percent is

$$\text{Profit \%} = \frac{(\text{True weight} - \text{False weight})}{\text{False weight}} \times 100$$

40% OFF

- **Discount = M.R.P – S.P**

Discount % $= \dfrac{(\text{M.R.P} - \text{S.P})}{\text{M.R.P}} \times 100$

Basic problems :

1. Find (i) S.P when C.P = 500, Profit % = 20%. **ANS: 600**
    (ii) C.P when S.P = 660, Profit % = 10% **ANS: 600**
    (iii) Profit % , when S.P = 800 , Profit = 200. **ANS: 33 1/3%**
    (iv) Loss % , when S.P = 450 , Loss = 150. **ANS: 25 %**

2. A man buys a Cooker for Rs. 2100 and sells it at a loss of 30%. What is the selling price of the Cooker ?

    a) 1520   **b) 1470**   **c) 1680**   **d) 1200**

3. A merchant buys an article for Rs. 27 and sells it at a profit of 10%. The selling price of the article is :

    a) 29.7   **b) 32.4**   **c) 28**   **d) 35**

4. A shopkeeper takes 10% profit on his goods. He lost 20% of his goods during a theft. What is his loss per cent ?

    a) 14% loss   **b) 16% loss**   **c) 12% loss**   **d) 20% loss**

MODEL : 1

1. A man bought 3 chocolates for a rupee. How many chocolates for a rupee must he sell to gain 50% ?

    a) 3   **b) 1**   **c) 2**   **d) 4**

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

    a) 22%   **b) 33%**   **c) 44%**   **d) 55%**

3. The cost price of 20 articles is the same as the selling price of "N" articles. If the profit is 25%, then the value of "N" is ?

    a) 24   **b) 18**   **c) 12**   **d)16**

4. A fruit seller buys 20 lemons for Rs. 10/- and sells them at 50 for Rs.30/- His profit percentage(%) is .

    a) 15%   **b) 20%**   **c) 25%**   **d) 32%**

MODEL : 2

1. A dishonest seller sold his goods at cost price but uses a weight of 750 grams for a Kg. weight. Find his profit (or) gain percent ?

    a) 33 1/3%   **b) 11 1/9%**   **c) 17 2/7%**   **d) 25%**

2. A dishonest shopkeeper uses a false weight of 800 gm instead of 1000 gm at the time of selling goods. Also he marks up his goods by 40% above cost price and gives 10% discount to the customer. In this whole process, find his overall profit percentage.

    a) 45.2%   **b) 57.5%**   **c) 65.2%**   **d) 18.5 %**

3. A shopkeeper uses 940 gm in place of one kg. He sells it at 4% profit. What will be the overall profit?

    a) 9.25%   **b) 12.69%**   **c) 10.64%**   **d) 11.12%**

4. A dishonest shopkeeper pretends to sell his goods at cost price but uses false weights and gains $11\frac{1}{9}\%$. Find the false weight he is using instead of 1kg weight.

    a) 800 grams   **b) 900 grams**   **c) 650 grams**   **d) 850 grams**

MODEL : 3

1. After getting two successive discounts, a shirt with a list price of Rs.150 is available at Rs.105. If the second discount is 12.5%, then find the first discount .

    a) 15%   **b) 12%**   **c) 25%**   **d) 20%**

2. At what percentage above the cost price must an article be marked so as to gain 33% after allowing a customer a rebate of 5% ?

    a) 40%   **b) 35%**   **c) 33%**   **d) 56%**

3. A shopkeeper fixes the marked price of an item 45% above its cost price. The percentage of discount allowed to gain 16% is ?

    a) 30%   **b) 20%**   **c) 80%**   **d) 15%**

MISCELLANEOUS:

1. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is:

   a) 8%   b) 5%   c) 16%   d)

2. A man buys 3 cows and 8 goats for Rs. 47,200. Instead if he would have bought 8 cows and 3 goats, he had to pay Rs. 53,000 more. Cost of one cow is :

   a) 1400   b) 15000   c) 12000   d) 20000

3. A man buys 4 tables and 5 chairs for Rs.1000. If he sells the tables at 10% profit and chairs 20% profit, he earns a profit of Rs. 120. What is the cost of one table ?

   a) 150   b) 200   c) 100   d) 225

4. If the selling price is doubled, the profit increases by four times. Find the profit percentage ?

   a) 50%   b) 25%   c) 60%   d) 80%

5 . If 10% loss is made on selling price, then the percentage of loss on the S.P is what percentage on the cost price ?

   a) 9 1/11%   b) 15 2/9 %   c) 16 4/7%   d) None of these.

6. A clock was sold for Rs. 144. If the percentage of profit was numerically equal to the cost price, the cost of the clock was .

   a) 70   b) 80   c) 90   d) 120

7. A shopkeeper marks price 25% more than the cost price of that article and gives a discount of 10% on marked price. If marked price of an article is 2500 Rs, how much profit will the shopkeeper gain after selling that article ?

   a) 300   b) 450   c) 250   d) 175

8. A man buys 4 tables and 5 chairs for Rs.1000. If he sells the tables at 10% profit and chairs 20% profit, he earns a profit of Rs. 120. What is the cost of one table ? **(REPEATED)**

   a) 200   b) 200   c) 200   d) 200

9. If the cost price is 96% of the selling price, then what is the profit percent ?

   a) 4.16%   b) 7.89%   c) 6.25%   d) 5.55%

10. Sam purchased 20 dozens of bananas 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 ?

   a) 8.25%   b) 5.6%   c) 6.8%   d) 9.99%

CHALLENGES:

1. Gita sells two objects A and B at the same price such that she makes a profit of 20% on object A and a loss of 10% on object B. If she increases the selling price such that objects A and B are still sold at an equal price and a profit of 10% is made on object B, then the profit made on object A will be nearest to

A) 42%   B) 47%   C) 49%   D) 52 %   (ANS:47%)

2. Amal buys 110 kg of syrup and 120 kg of juice, syrup being 20% less costly than juice, per kg. He sells 10 kg of syrup at 10% profit and 20 kg of juice at 20% profit. Mixing the remaining juice and syrup, Amal sells the mixture at ₹ 308.32 per kg and makes an overall profit of 64%. Then, Amal's cost price for syrup, in rupees per kg, is

A) 120   B) 140   C) 160   D) 200   (ANS: 160)

Basic problems

① (i) SP = ? CP = 500, P.% = 20%.

10% (500) = 50   + 10% of 500 = 50
                  $\rightarrow$
                  100

$\boxed{SP = 600}$

(ii) C.P = ?, S.P = 660, P% = 10%.

110% $\rightarrow$ 660

1% $\rightarrow$ 6

C.P = $\boxed{100\% \rightarrow 600}$

(iii) P% = ? ; S.P = 800; Profit = 200

(800 - 200 = CP)

$P\% = \dfrac{Profit}{CP} \times 100$

$= \dfrac{200}{600} \times 100 \Rightarrow \dfrac{1}{3} \times 100 = \boxed{33.33\%}$

(or)

$33\dfrac{1}{3}\%$

(iv) L.%g = ? ; S.P = 450; Loss = 150

$L\% = \dfrac{loss}{CP} \times 100 = \dfrac{150}{600} \times 100$

$\boxed{L\% = 25\%}$

② C.P = 2100, loss = 30%.

$L\% = \dfrac{loss}{CP} \times 100$

$30 = \dfrac{(2100 - x)}{2100} \times 100$

$630 = 2100 - x$

$\boxed{x = 1470}$

(or)

C.P = 100%.
S.P = 70%.

100% $\rightarrow$ 2100

1% $\rightarrow$ 21

70% $\rightarrow$ 70 × 21

$\boxed{1470}$

③.

$C \cdot P = 27$

$P \cdot \% = 10\% \Rightarrow 10\% (27) = 2.7$

$S \cdot P = 27 + 2.7 = \boxed{29.7}$

MODEL: 1

1.)

$100\% \rightarrow 3$ (Indirect Relation.
$150\% \rightarrow ?$ (So) direct multiplication

$$\dfrac{2\cancel{100} \times \cancel{3}}{\underset{3}{\cancel{150}}} = x \Rightarrow \boxed{x = 2}$$

②. $\left(6A \Rightarrow 5₹ (C \cdot P)\right)^{\times 5} \Rightarrow 30A \rightarrow 25₹$

$\left(5A \Rightarrow 6₹ (S \cdot P)\right)^{\times 6}$ $30A \rightarrow 36₹$

$P\% \Rightarrow \dfrac{SP - CP}{CP} \times 100$

$\Rightarrow \dfrac{36 - 25}{25} \times 100$

$= \dfrac{11}{25} \times 100 \Rightarrow \boxed{44\%}$

③. Let $C \cdot P$ of each article $= 1$

$C \cdot P$ of 20 Articles $= 20₹$

∴ $S \cdot P$ of 'N' Articles $= 20₹$

Now 25% profit $\Rightarrow \dfrac{1}{4} \Rightarrow \dfrac{5}{4} \Rightarrow \overset{\overset{4}{\cancel{20}}}{\underset{16}{\cancel{4}}}$

∴ So, $\boxed{16}$ Articles sold.

④ $20L \rightarrow 10\,₹$ $\begin{bmatrix} \because \text{It is easy to say Profit \& loss} \\ \text{if we have same number of units.} \end{bmatrix}$
   $50L \rightarrow 30\,₹$

So; $\begin{cases} (20L \rightarrow 10\,₹) \times 5 \\ (50L \rightarrow 30\,₹) \times 2 \end{cases}$ $\Rightarrow$ 100 Lemon $\Rightarrow 50\,₹$
                                          100 Lemon $\Rightarrow 60\,₹$

$P\% = \dfrac{10}{50} \times 100 \Rightarrow 20\%$

$\boxed{P\% = 20\%}$

MODEL: 2

①. Gain percent $\% = \dfrac{1000 - 750}{750} \times 100$ ... ①

$= \dfrac{250}{750} \times 100 = \underline{33.33\%}$

②. Original wt $= 1000\,gm$, false wt $= 800\,gm$

diff $= 200\,gm$

Let $100\,gms = 100$ Rupees

So, MRP $= 1400\,(40\%\uparrow)$

S.P (After discount $10\%\downarrow) = 1400 - 140 = 1260$

$\therefore$ profit $\% = \dfrac{1260 - 800}{800} \times 100$

$= \dfrac{460}{800} \times 100$

$P\% = \dfrac{230}{4} \Rightarrow \underline{57.5\%}$

(3).

Let $100gm = 100\bar{z}$

$\therefore SP = 1040$

$P\% = \dfrac{1040-940}{940} \times 100$

$= \dfrac{5\cancel{100}}{\cancel{940}} \times 100$
$\quad\quad 47$

$= \dfrac{5}{47} \times 100 = \underline{\underline{10.64\%}}$

MODEL:3

① $\quad 150 \times \left(\dfrac{100-x}{100}\right) \times \left(\dfrac{87.5}{100}\right) = 105$

$\cancel{150} \times \left(\dfrac{100-x}{100}\right) \times \dfrac{7}{8} = \cancel{105}\;\; 21.3$
$\;\cancel{30}$
$\;10$

$10 \times \left(\dfrac{100-x}{100}\right) \times \dfrac{1}{8} = 1$

$100-x = 80 \Rightarrow \underline{\underline{x = 20\%}}$

② $\quad x \times \dfrac{95}{100} = \dfrac{133}{100} y \quad\quad \left[\begin{array}{l}\text{Here } x = MRP \\ \quad\quad y = CP\end{array}\right]$

$\dfrac{x}{y} = \dfrac{133}{95}\dfrac{7}{5} \Rightarrow \dfrac{x}{y} = \dfrac{7}{5}$

So, $\dfrac{2}{5} \times 100 \Rightarrow \underline{40\%}$

* 40% above the C.P must an item will be marked.

③
$$\overset{29}{\underset{\underset{20}{\cancel{100}}}{\cancel{145}}} \times \cancel{x} \times \left(\frac{100-y}{\cancel{100}}\right) = \frac{116}{\cancel{100}} \cancel{x}$$

$$\frac{29}{20} \times (100-\cancel{y}) = 116 \cdot 4$$

$$(100-y) = 80 \implies \boxed{y = 20\%}$$

MISCELLANEOUS :

①

$\underline{A}$	$\underline{B}$
26kg 20₹/kg	30kg 36₹/kg

- $26 \times 20 + 30 \times 36 = 520 + 1080 \implies \boxed{1600}$

- On other hand $(56) \times 30 = 1680$

$$\text{profit} \% = \frac{1680-1600}{1600} \times 100 \quad \frac{\overset{5}{\cancel{80}}}{\cancel{1600}} \times 100 = 5\%$$

$$\underline{p\% = 5\%}$$

②
$$(3c + 8g = 47,200) \times 5 \implies ①$$
$$(5c - 5g = 53,000) \times 3 \implies ②$$

$$15c + 40g = 236000$$
$$\underline{15c - 15g = 159000} -$$
$$\pm \qquad \mp$$
$$55g = 77000 \implies \boxed{g = 1400}$$

$$\therefore \boxed{c = 12,000} \checkmark$$

③. $4T + 5C = 1000 \longrightarrow ①$

$\frac{1}{10} \times 4T + \frac{1}{5} \times 5C = 120$

$4T + 10C = 1200 \longrightarrow ②$

From ① & ②

$\quad 4T + 5C = 1000$

$\quad \underline{-4T \pm 10C = 1200}$

$\quad\quad +5C = +200$

$\quad\quad \boxed{C = 40}$

∴ Cost of one table ⟹ $4T = 1000 - 5 \times 40$

$\quad\quad\quad\quad 4T = 800$

$\quad\quad\quad\quad \boxed{T = 200}$

④.

$S.P - C.P = profit$

$2(S.P) - C.P = 4(profit)$

$2(S.P) - C.P = 4(S.P - C.P)$

$2(sp) - C.p = 4(sp) - 4(c.p)$

$2(S.P) = 3(C.P)$

$\frac{SP}{CP} = \frac{3}{2}$

$Profit\% = \frac{(S.P - C.P) \times 100}{C.P}$

$= \frac{(3x - 2x)}{2x} \times 100$

$= \frac{x}{2x} \times 100$

$\boxed{P\% = 50\%}$

5.) 10% loss on $S.P \to \dfrac{9}{10\,(S.P)}$ $\implies$ loss $= 1$

$$C.P = SP + loss$$
$$CP = 10 + 1$$

$$\therefore \quad \frac{1}{11} \times 100 = 9.09\% \ (or) \ 9\tfrac{1}{11}\%.$$

6.

The meaning of Question is, if profit $\%$ is 20% then
C.P is $20Rs$ (or) If profit $\%$ is 50% then the
C.P is $50Rs$.

- It is easy when you checkit by the options.

option(b) $80 + 80\% \,(80) = 144 \ \checkmark$ Ans:

                                           80 (option b)

option(A). $70 + 70\% \,(70) = 119 \ X$

7.) $25-1\uparrow (\text{more}) \implies \dfrac{5}{4} \dfrac{(M.R.P)\ 60)\ \text{Marked price}}{(C.P)}$

10% discount on $M.P = \dfrac{1}{10} \times 5 = 0.5$

$$So) \ SP = 4.5$$

$$SP \to 2500 Rs$$
$$\text{discount} \ 0.5P \to \underset{\underset{\text{Minus}}{(50\,F)}}{2250} \ (\text{Final } SP)$$

$$C.P \implies 4P \to 2000$$

$$\therefore \ profit = (S.P - C.P)$$
$$= 2250 - 2000$$
$$profit = 250$$

(8.)

$$4T + 5C = 1000$$

$$10\% (1000) = 100$$

But profit here is $\boxed{120}$

$$\therefore \quad 20 = \underline{10\%} (y)$$

$$200 = y$$

- If placing 'y' as 'c' the condition will not be satisfied as only cost of chairs become '1000'. So, it must be the cost of one table.

$$4(200) + 5(40) = 1000$$

__Ans;__ $\therefore$ Cost of one table $= 200$

(9)

$$C \cdot P = \frac{96}{100} (S \cdot P)$$

$$\therefore C \cdot P = 96$$
$$S \cdot P = 100$$

$$P\% = \frac{S \cdot P - C \cdot P}{C \cdot P} \times 100$$

$$P\% = \frac{(100 - 96)}{96} \times 100$$

$$= \frac{4}{96} \times 100 \underset{6}{\overset{25}{}} = 4.16\%$$

10) $\dfrac{375}{12} = 31.25 \ (c.p)$

$33 \ (sp)$

$p\% = \dfrac{(SP - C.P)}{C.P} \times 100$

$= \dfrac{33 - 31.25}{31.25} \times 100 = \dfrac{1.75}{31.25} \times 100 = \dfrac{175}{3125} \times 100$

$p\% = 5.6\%$