Profit, Loss and Discount

POINTS TO REMEMBER

1. The Cost Price (C.P.) of an article is the price at which the article is bought.
2. The Selling Price (S.P.) of an article is the price at which the article is sold.
3. If **Selling Price** of an article is more than its cost price ; it is sold at a **profit (gain)**
   Profit = Selling Price-Cost Price
   i.e., Profit (gain) = S.P. – C.P. and S.P. = C.P. + Gain
4. If Selling Price of an article is less than its cost price ; it is sold at a loss.
   Loss = Cost Price – Selling Price
   i.e., **Loss = C.P. – S.P. and S.P. = C.P. — Loss**
5. Profit percent and loss percent are always calculated on cost price (C.P.) only.
   i.e., **(i)** Profit % = $\frac{Profit}{C.P.}$ x 100% and
   (ii) Loss % = $\frac{Loss}{C.P.}$ x 100%
6. **Selling Price** = Marked price – Discount
   i.e., S.P. = M.P.—(piscount
   Note : (i) Discount is calculated on marked price (M.P.)
   (ii) Marked price is also written as List price.

EXERCISE 9 (A)

Question 1.
Find the gain or loss percent, if
(i) C.P. = Rs. 200 and S.P.: = Rs. 224
(ii) C.P. = Rs. 450 and S.P. = Rs. 400
(iii) C.P. = Rs. 550 and gain = Rs . 22
(iv) CP. = Rs. 216 and loss = Rs. 72
(v) S.P. = Rs. 500 and loss : = Rs. 100
(vi) S.P. = Rs. 12 and profit = Rs. 4
(vii) C.P. = Rs. 5 and gain = 60 P

Solution:

(i) C.P. = Rs. 200 and S.P. = Rs. 224

$\therefore$ Gain = S.P. – C.P.

$\qquad$ = Rs. 224 – Rs. 200 = Rs. 24

Gain % = $\dfrac{\text{gain} \times 100}{\text{C.P.}} = \dfrac{24 \times 100}{200} = 12\%$

(ii) C.P. = Rs. 450 and S.P. = Rs. 400

$\therefore$ Loss = C.P. – S.P.

$\qquad$ = Rs. 450 – Rs. 400 = Rs. 50

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

$\qquad = \dfrac{50 \times 100}{450} = \dfrac{100}{9} = 11\dfrac{1}{9}\%$

(iii) C.P. = Rs. 550 and gain = Rs. 22

$\therefore$ S.P. = C.P. + gain

$\qquad$ = Rs. 550 + Rs. 22 = Rs. 572

Gain % = $\dfrac{\text{Gain} \times 100}{\text{C.P.}} = \dfrac{22 \times 100}{550} = 4\%$

(iv) C.P. = Rs. 216 and loss = Rs. 72

$\therefore$ S.P. = C.P. – loss

$\qquad$ = Rs. 216 – Rs. 72 = Rs. 144

Loss % = $\dfrac{\text{Loss} \times 100}{\text{C.P.}} = \dfrac{72 \times 100}{216} = \dfrac{100}{3}$

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

(v) S.P. = Rs. 500 and loss = Rs. 100

$\therefore$ C.P. = S.P. + loss

$\qquad$ = Rs. 500 + Rs. 100 = Rs. 600

Loss % = $\dfrac{\text{Loss} \times 100}{\text{C.P.}} = \dfrac{100 \times 100}{600}$

$\qquad = \dfrac{50}{3} = 16\dfrac{2}{3}\%$

(vi) S.P. = Rs. 12 and profit = Rs. 4

$\therefore$ C.P. = S.P. – gain = Rs. 12 – Rs. 4 = Rs. 8

Gain % = $\dfrac{\text{Gain} \times 100}{\text{S.P.}} = \dfrac{4 \times 100}{8} = 50\%$

(vii) C.P. = Rs. 5 and gain = 60 P

$\therefore$ S.P. = C.P. + gain = Rs. 5 + 60 P.

$\qquad$ = Rs. 5·60

Gain % = $\dfrac{\text{Gain} \times 100}{\text{C.P.}} = \dfrac{0\cdot60 \times 100}{5}$

$\qquad = \dfrac{60 \times 100}{100 \times 5} = 12\%$

Question 2.
Find the selling price, if:
(i) C.P. = Rs. 500 and gain = 25%
(ii) C.P. = Rs. 60 and loss = 12 1/2%
(iii) C.P. = Rs. 150 and loss = 20%
(iv) C.P. = Rs. 80 and gain = 2.5%

Solution:

(i) C.P. = Rs. 500, gain = 25%

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

$$= \frac{500\,(100 + 25)}{100} = \text{Rs.} \frac{500 \times 125}{100}$$

$$= \text{Rs. } 625$$

(ii) C.P. = Rs. 60

$$\text{Loss} = 12\frac{1}{2}\% = \frac{25}{2}\%$$

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

$$= \frac{60\left(100 - \dfrac{25}{2}\right)}{100} = \frac{60\left(\dfrac{200 - 25}{2}\right)}{100}$$

$$= \frac{60 \times 175}{2 \times 100} = \text{Rs.} \frac{105}{2} = \text{Rs. } 52\cdot50$$

(iii) C.P. = Rs. 150, Loss = 20%

$$\therefore \text{S.P.} = \frac{\text{C.P. } (100 - \text{loss}\%)}{100}$$

$$= \frac{150\,(100 - 20)}{100} = \frac{150 \times 80}{100}$$

$$= \text{Rs. } 120$$

(iv) C.P. = Rs. 80, gain = 2·5%

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

$$= \frac{80\,(100 + 2\cdot5)}{100} = \frac{80 \times 102\cdot5}{100}$$

$$= \frac{\text{Rs. } 80 \times 1025}{100 \times 10} = \text{Rs. } 82$$

Question 3.
Rohit bought a tape-recorder for Rs. 1,500 and sold it for Rs. 1,800. Calculate his profit or loss percent.

Solution:

C.P. of tape-recorder = Rs. 1500

S.P. = Rs. 1800

$\therefore$ Gain = S.P. – C.P.

$\quad\quad\quad$ = Rs. 1800 – Rs. 1500 = Rs. 300

Gain % = $\dfrac{\text{Gain} \times 100}{\text{C.P.}} = \dfrac{300 \times 100}{1500}$

$\quad\quad\quad$ = 20%

Question 4.
An article bought for Rs. 350 is sold at a profit of 20%. Find its selling price.

Solution:

C.P. of article = Rs. 350

Profit = 20%

$\therefore$ S.P. = $\dfrac{\text{C.P.} (100 + \text{profit}\%)}{100}$

$\quad$ = Rs. $\dfrac{350\,(100 + 20)}{100}$ = Rs. $\dfrac{350 \times 120}{100}$

$\quad$ = Rs. 420

Question 5.
An old machine is bought for Rs. 1,400 and is sold at a loss of 15%. Find its selling price.

Solution:

C.P. of the machine = Rs. 1400

Loss = 15%

$\therefore$ S.P. = $\dfrac{\text{C.P.} (100 - \text{Loss}\%)}{100}$

$\quad$ = $\dfrac{1400\,(100 - 15)}{100}$ = Rs. $\dfrac{1400 \times 85}{100}$

$\quad$ = Rs. 1190

Question 6.
Oranges are bought at 5 for Rs. 10 and sold at 6 for Rs. 15. Find profit or loss as percent.

Solution:

L.C.M. of 5 and 6 = 30

Let 30 oranges are bought

$\therefore$ C.P. of 30 oranges $= \dfrac{30 \times 10}{5} = $ Rs. 60

and S.P. of 30 oranges $= \dfrac{30 \times 15}{6}$

$\qquad\qquad\qquad = $ Rs. 75

Gain = S.P. $\neg$ C.P.

$\qquad = $ Rs. 75 $-$ Rs. 60 = Rs. 15

$\therefore$ Gain % $= \dfrac{\text{gain} \times 100}{\text{C.P.}}$

$\qquad = \dfrac{15 \times 100}{60} = 25\%$

Question 7.
A certain number of articles are bought at 3 for Rs. 150 and all of them are sold at 4 for Rs. 180. Find the loss or gain as percent.

Solution:

L.C.M. of 3 and 4 = 12

Let 12 articles are bought

$\therefore$ C.P. of 12 articles = Rs. $\dfrac{150 \times 12}{3}$

$\qquad\qquad\qquad = $ Rs. 600

and S.P. of 12 articles = Rs. $\dfrac{180 \times 12}{4}$

$\qquad\qquad\qquad = $ Rs. 540

Loss = C.P. $-$ S.P.

$\qquad = $ Rs. 600 $-$ Rs. 540 = Rs. 60

Loss % $= \dfrac{\text{Loss} \times 100}{\text{C.P.}} = \dfrac{60 \times 100}{600}$

$\qquad = 10\%$

A vendor bought 120 sweets at 20 p each. In his house, 18 were consumed and he sold the remaining at 30 p each. Find his profit or loss as percent.

Solution:

Quantity of sweets bought = 120

$\therefore$ C.P. of 120 sweets $= \dfrac{120 \times 20}{100}$

$= $ Rs. 24

No. of sweets consumed = 18

Balance sweets = 120 – 18 = 102

$\therefore$ S.P. of 102 sweets

$= \dfrac{102 \times 30}{100} = \dfrac{3060}{100} = $ Rs. 30·60

Gain = S.P. – C.P.

$= $ Rs. 30·60 – Rs. 24 = Rs. 6·60

Gain % $= \dfrac{\text{gain} \times 100}{\text{C.P.}} = \dfrac{6 \cdot 60 \times 100}{24}$

$= \dfrac{660 \times 100}{100 \times 24} = \dfrac{55}{2} = 27 \cdot 5\%$

Question 9.
The cost price of an article is Rs. 1,200 and selling price is $\frac{5}{4}$ times of its cost price. Find:
(i) selling price of the article
(ii) profit or loss as percent.

Solution:

Cost price (C.P.) = Rs. 1200

$\therefore$ S.P. $= \dfrac{5}{4}$ of C.P.

$= \dfrac{5}{4} \times 1200 = $ Rs. 1500

$\therefore$ Gain = S.P. – C.P.

$= $ Rs. 1500 – Rs. 1200 = Rs. 300

$\therefore$ Gain% $= \dfrac{\text{gain} \times 100}{\text{C.P.}} = \dfrac{300 \times 100}{1200}$

$= 25\%$

Question 10.

The selling price of an article is Rs. 1,200 and cost price is $\frac{5}{4}$ times of its selling price,

find :

(i) cost price of the article ;

(ii) profit or loss as percent.

Solution:

(i) S.P. of an article = Rs. 1200

$\therefore$ C.P. $= \dfrac{5}{4}$ of S.P. $= \dfrac{5}{4} \times 1200 =$ Rs. 1500

(ii) Loss = C.P. $-$ S.P.

$= $ Rs. 1500 $-$ Rs. 1200 = Rs. 300

Loss% $= \dfrac{\text{Loss} \times 100}{\text{C.P.}} = \dfrac{300 \times 100}{1500}$

$= \dfrac{100}{5} = 20\%$

Question 1.
Find the cost price, if:
(i) S.P. = Rs. 21 and gain = 5%
(ii) S.P. = Rs. 22 and loss = 12%
(iii) S.P. = Rs. 340 and gain = Rs. 20
(iv) S.P. = Rs. 200 and loss = Rs. 50
(v) S.P. = Re. 1 and loss = 5 p.

Solution:

(i) S.P. = Rs. 21, Gain = 5%

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 + \text{gain\%}} = \frac{21 \times 100}{100 + 5}$$

$$= \frac{21 \times 100}{105} = \text{Rs. } 20$$

(ii) S.P. = Rs. 22, loss = 12%

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 - \text{loss\%}} = \frac{22 \times 100}{100 - 12}$$

$$= \frac{22 \times 100}{88} = \text{Rs.} 25$$

(iii) S.P. = Rs. 340, Gain = Rs. 20

$$\therefore \text{C.P.} = \text{S.P.} - \text{Gain}$$

$$= \text{Rs. } 340 - \text{Rs. } 20 = \text{Rs. } 320$$

(iv) S.P. = Rs. 200

Loss = Rs. 50

$$\therefore \text{C.P.} = \text{S.P.} + \text{loss}$$

$$= \text{Rs. } 200 + \text{Rs. } 50 = \text{Rs. } 250$$

(v) S.P. = Re 1, Loss = 5 paise

$$\therefore \text{C.P.} = \text{S.P.} + \text{loss}$$

$$= \text{Re } 1 + 5 \text{ p}$$

$$= \text{Rs. } 1 \cdot 05$$

By selling an article for Rs. 810, a loss of 10 percent is suffered. Find its cost price.

Solution:

S.P. of an article = Rs. 810

Loss = 10 %

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 - \text{Loss}\%} = \frac{810 \times 100}{100 - 10}$$

$$= \frac{810 \times 100}{90} = \text{Rs. } 900$$

Question 3.
By selling a scooter for Rs. 9,200, a man gains 15%. Find the cost price of the scooter.

Solution:

S.P. of the scooter = Rs. 9200

Gain = 15%

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 + \text{gain}\%} = \frac{9200 \times 100}{100 + 15}$$

$$= \frac{9200 \times 100}{115} = \text{Rs.} 8000$$

Question 4.
On selling an article for Rs. 2,640, a profit of 10 percent is made. Find
(i) cost price of the article
(ii) new selling price of it, in order to gain 15%

Solution:

S.P. of an article = Rs. 2640

Gain = 10%

(i) $\therefore$ C.P. $= \dfrac{\text{S.P.} \times 100}{100 + \text{gain}\%}$

$= \text{Rs.} \dfrac{2640 \times 100}{100 + 10}$

$= \text{Rs.} \dfrac{2640 \times 100}{110} = \text{Rs. } 2400$

(ii) In second case, Gain = 15%

$\therefore$ S.P. $= \dfrac{\text{C.P. } (100 + \text{gain } \%)}{100}$

$= \text{Rs.} \dfrac{2400 \, (100 + 15)}{100}$

$= \text{Rs.} \dfrac{2400 \times 115}{100} = \text{Rs. } 2760$

Question 5.
A T.V. set is sold for Rs. 6800 at a loss of 15%. Find
(i)cost price of the T.V. set.
(ii)new selling price of it, in order to gain 12%

Solution:

S.P. of the T.V. set = Rs. 6800

Loss = 15%

$(i) \therefore$ C.P. $= \dfrac{S.P. \times 100}{100 - loss\%} =$ Rs. $\dfrac{6800 \times 100}{100 - 15}$

$=$ Rs. $\dfrac{6800 \times 100}{85} =$ Rs. 8000

(ii) In second case, gain = 12 %

$\therefore$ S.P. $= \dfrac{C.P. \ (100 + gain \%)}{100}$

$=$ Rs. $\dfrac{8000 \ (100 + 12)}{100} =$ Rs. $\dfrac{8000 \times 112}{100}$

$=$ Rs. 8960

Question 6.
A fruit seller bought mangoes at Rs. 90 per dozen and sold them at a loss of 8 percent. How much will a customer pay for.
(i) one mango
(ii) 40 mangoes

Solution:

C.P. of 1 dozen or 12 mangoes = Rs. 90

Loss = 8%

$\therefore$ S.P. of 1 dozen or 12 mangoes

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

$=$ Rs. $\dfrac{90(100 - 8)}{100} = \dfrac{90 \times 92}{100} = \dfrac{828}{10} =$ Rs. 82.80

(i) S.P. of 1 mango $= \dfrac{82.80}{12} =$ Rs.6.90

(ii) S.P. of 40 mangoes $=$ Rs. 6.90 $\times$ 40

$=$ Rs. 276

Question 7.

By selling two transistors for Rs. 00 each, a shopkeeper gains 20 percent on one transistor and loses 20 percent on the other.

Find :

(i) C.P. of each transistor

(ii) total C.P. and total S.P. of both the transistors

(iii) profit or loss percent on the whole.

Solution:

S.P. of first transistor = Rs. 600

Gain = 20%

(i) $\therefore$ C.P. $= \dfrac{S.P. \times 100}{100 + gain\%} = \dfrac{600 \times 100}{100 + 20}$

$= \dfrac{600 \times 100}{120} =$ Rs. 500

S.P. of the second transistor = Rs. 600

Loss = 20%

$\therefore$ C.P. of the other transistor

$= \dfrac{S.P. \times 100}{100 - loss\%} = \dfrac{600 \times 100}{100 - 20}$

$=$ Rs. $\dfrac{600 \times 100}{80} =$ Rs. 750

$\therefore$ C.P. of the two transistors are Rs. 500 and Rs. 750

(ii) Total C.P. of both the transistors

$=$ Rs. 500 + Rs. 750 = Rs. 1250

and total S.P. of both the transistors

$=$ Rs. 600 + Rs. 600 = Rs. 1200

(iii) Total loss = C.P. – S.P.

$= 1250 - 1200 =$ Rs. 50

$\therefore$ loss% $= \dfrac{loss \times 100}{C.P.} = \dfrac{50 \times 100}{1250} = 4\%$

Mangoes are bought at 20 for Rs. 60. If they are sold at $33\frac{1}{3}$ percent profit.
Find:
(i) selling price of each mango.
(ii) S.P. of 8 mangoes.

Solution:

C.P. of 20 mangoes = Rs. 60

$$\text{Gain} = 33\frac{1}{3}\% = \frac{100}{3}\%$$

$$\therefore \text{ S.P. of 20 mangoes} = \frac{\text{C.P.} \times (100 + \text{gain}\%)}{100}$$

$$= \frac{60\left(100 + \frac{100}{3}\right)}{100} = \text{Rs.}\frac{60 \times 400}{100 \times 3} = \text{Rs. } 80$$

$$(i)\text{ S.P. of 1 mango } = \text{Rs.}\frac{80}{20} = \text{Rs.} 4$$

$$(ii)\text{ S.P. of 8 mangoes} = \text{Rs. } 4 \times 8$$
$$= \text{Rs. } 32$$

Question 9.
Find the cost price of an article, which is sold for Rs. 4050 at a loss of 10%. Also, find the new selling price of the article which must give a profit of 8%.

Solution:

S.P. of an article = Rs. 4050

Loss = 10%

$$(i) \therefore \text{ C.P. of the article} = \frac{\text{S.P.} \times 100}{100 - \text{loss}\%}$$

$$= ₹\frac{4050 \times 100}{100 - 10} = ₹\frac{4050 \times 100}{90}$$

$$= ₹4500$$

(ii) When gain = 8%

∴ New S.P. of the article

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

$$= ₹\frac{4500 \, (100 + 8)}{100}$$

$$= ₹\frac{4500 \times 108}{100} = ₹4860$$

Question 10.

By selling an article for ₹825, a man loses $\frac{1}{3}$ equal to j of its selling price. Find :
(i) the cost price of the article,
(ii) the profit percent or the loss percent made, if the same article is sold for ₹1265.

Solution:

S.P. of an article = ₹825

$$\text{Loss} = \frac{1}{3} \text{ of S.P.} = \frac{1}{3} \times 825 = ₹275$$

(i) ∴ C.P. = S.P. + Loss
    = ₹825 + ₹275 = ₹1100

(ii) In second case,

S.P. = ₹1265

∴ Gain = S.P. – C.P.
    = ₹1265 – ₹1100 = ₹165

$$\text{Gain } \% = \frac{\text{gain} \times 100}{\text{C.P.}}$$

$$= \frac{165 \times 100}{1100} = 15\%$$

Question 11.
Find the loss or gain as percent, if the C.P. of 10 articles, all of the same kind, is equal to S.P. of 8 articles.

Solution:

C.P. of 10 articles = S.P. of 8 articles = ₹80

(suppose)

$\therefore$ C.P. of 1 article = $\dfrac{80}{10}$ = ₹ 8

and S.P. of 1 article = $\dfrac{80}{8}$ = ₹ 10

$\therefore$ Gain = S.P. – C.P. = ₹ 10 – ₹ 8 = ₹ 2

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

$= \dfrac{2 \times 100}{8} = 25\%$

Question 12.
Find the loss or gain as percent, if the C.P. of 8 articles, all of the same kind, is equal to S.P. of 10 articles.

Solution:

C.P. of 8 articles = S.P. of 10 articles = ₹80

(suppose)

$\therefore$ C.P. of 1 article = $\dfrac{80}{8}$ = ₹ 10

and S.P. of 1 article = $\dfrac{80}{10}$ = ₹ 8

$\therefore$ Loss = C.P. – S.P. = ₹ 10 – ₹ 8 = ₹ 2

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

$= \dfrac{2 \times 100}{10} = 20\%$

Question 13.
The cost price of an article is 96% of its selling price. Find the loss or the gain as percent on the whole.

Solution:

Let S.P. = ₹100

C.P. = 96% of S.P.

$$= ₹\frac{96}{100} \times 100 = ₹96$$

∴ Gain = ₹100 − ₹96 = ₹4

and, Gain percent

$$= \frac{Gain \times 100}{C.P.}$$

$$= \frac{4}{96} \times 100\%$$

$$= \frac{25}{6} \text{ or } 4\frac{1}{6}\%$$

Question 14.
The selling price of an article is 96% of its cost price. Find the loss or the gain as percent on the whole.

Solution:

Let C.P. = ₹100

S.P. = 96% of C.P.

$$= ₹\frac{96}{100} \times 100 = ₹96$$

∴ Loss = ₹100 − ₹96 = ₹4

and loss percent $= \frac{Loss \times 100}{C.P.}$

$$= \frac{4}{100} \times 100\%$$

$$= 4\%$$

Question 15.
Hundred oranges are bought for ₹350 and all of them are sold at the rate of ₹48 per dozen. Find the profit percent or loss percent made.

Solution:

$$\because \text{C.P. of one orange} = ₹\frac{350}{100} = ₹3.50$$

$$\text{and S.P. of one orange} = ₹\frac{48}{12} = ₹4$$

Clearly, Gain = ₹4 - ₹3.50 = ₹0.50

$$\text{and Gain percent} = \frac{\text{Gain} \times 100}{\text{C.P.}}$$

$$= ₹\frac{0.50}{3.50} \times 100\% = 14\frac{2}{7}\%$$

Question 16.
Oranges are bought at 100 for ?80 and all of them are sold at ₹80 for ₹100. Find the loss or gain as percent in this transaction.

Solution:

$$\because \text{C.P. of one orange} = ₹\frac{80}{100} = ₹0.8$$

$$\text{and S.P. of one orange} = ₹\frac{100}{80} = ₹1.25$$

Clearly, profit = ₹1.25 – ₹0.8 = ₹0.45

$$\text{and profit\%} = ₹\frac{0.45}{0.8} \times 100$$

$$= \frac{45}{8} \times \frac{100 \times 10}{100}$$

$$= \frac{450}{8} = 56.25\%$$

$$\therefore \text{Profit\%} = 56.25\%$$

Question 17.
An article is bought for ₹5,700 and ₹1,300 is spent on its repairing, transportion, etc. For how much should this article be sold in order to gain 20% on the whole.

Solution:
C.P. of an article = ₹5700

Amount spent on repair = ₹1300

Total cost price (C.P.) = ₹5700 + ₹1300

$\qquad\qquad\qquad$ = ₹7000

Gain = 20%

$\therefore$ S.P. of an article = $\dfrac{\text{C.P.} \times (100 + \text{Gain\%})}{100}$

$= ₹\dfrac{7000 \times (100 + 20)}{100}$

$= ₹\dfrac{7000 \times 120}{100} = ₹\dfrac{840000}{100} = ₹8400$

$\therefore$ Selling price of an article (S.P.) = ₹8400

EXERCISE 9 (C)

Question 1.
A machine is marked at ₹5000 and is sold at a discount of 10%. Find the selling price of the machine.

Solution:
Marked price (M.P.) of the machine

$\qquad$ = ₹5000

Rate of discount = 10%

$\therefore$ Amount of discount = ₹5000 × $\dfrac{10}{100}$ = ₹500

$\therefore$ Selling price = M.P. – discount

$\qquad$ = ₹5000 – ₹500 = ₹4500

Question 2.
shopkeeper marked a dinner set for ₹1000. He sold it at ₹900, what percent discount did he give ?

Solution:

Marked price of a dinner set = ₹1000

and selling price (S.P.) = ₹900

∴ Amount of discount = Rs. 1000 – ₹900

$$= ₹100$$

$$∴ \text{Discount percent} = \frac{\text{Discount} \times 100}{\text{M.P.}}$$

$$= \frac{100 \times 100}{1000} = 10\%$$

Question 3.
A pair of shoes marked at ₹320, are sold at a discount of 15 percent.
Find :
(i) discount
(ii) selling price of the shoes.

Solution:

Marked Price (M.P.) of shoes = ₹320

Rate of discount = 15%

$$(i) \ ∴ \text{Amount of discount} = ₹\frac{320 \times 15}{100} = ₹48$$

(ii) Selling price = M.P. – Discount

$$= ₹320 – 48 = ₹272$$

Question 4.
The list price of an article is ₹450 and it is sold for ₹360.
Find :
(i) discount
(ii) discount percent

Solution:

List price (M.P.) of an article = ₹450

Selling price = ₹360

(i) ∴ Amount of discount = M.P. – S.P.

₹450 – ₹360 = ₹90

(ii) Discount percent. = $\dfrac{\text{Discount} \times 100}{\text{M.P.}}$

$= \dfrac{90 \times 100}{450} = 20\%$

Question 5.
A shopkeeper buys an article for ₹300. He increases its price by 20% and then gives 10% discount on the new price. Find:
(i) the new price (marked price) of the article.
(ii) the discount given by the shopkeeper.
(iii) the selling price.
(iv) profit percent made by the shopkeeper.

Solution:

C.P. of an article = ₹300

Increase in price = 20%

(i) ∴ Marked price (M.P.)

$= \dfrac{\text{C.P.} \times (100 + \text{increase}\%)}{100}$

$= ₹\dfrac{300(100 + 20)}{100}$

$= ₹\dfrac{300 \times 120}{100} = ₹360$

(ii) Rate of discount = 10%

Amount of discount

$= ₹\dfrac{360 \times 10}{100} = ₹36$

(iii) ∴ Selling price = M.P. – discount

$= ₹360 – 36 = ₹324$

(iv) Net profit to the shopkeeper
= S.P. – C.P. = Rs. 324 – 300 = Rs. 24

Gain % $= \dfrac{\text{gain} \times 100}{\text{C.P.}} = \dfrac{24 \times 100}{300} = 8\%$

Question 6.
A car is marked at Rs. 50,000. The dealer gives 5% discount on first Rs. 20,000
and 2% discount on the remaining Rs. 30,000.
Find :
(i) the total discount.
(ii) the price charged by the dealer.

Solution:

Marked Price (M.P.) of a car = Rs. 50,000

Discount at the rate of 5% on first

Rs. 20,000 = Rs. $\dfrac{20,000 \times 5}{100}$ = Rs. 1000

Discount at the rate of 2% on remaining

Rs. 30,000 = Rs. $\dfrac{30,000 \times 2}{100}$ = Rs 600

(i) ∴ Total discount = Rs. 1000 + Rs. 600

= Rs. 1600

(ii) Price charged by the dealer

= Rs. 50,000 – Rs. 1600 = Rs. 48400

Question 7.
A dealer buys a T.V. set for Rs. 2500. He marks it at Rs. 3,200 and then gives a
discount of 10% on it.
Find :
(i) the selling price of the T.V. set
(ii) the profit percent made by the dealer.

Solution:

C.P. of a T.V. set = Rs. 2,500, M.P.=Rs. 3,200

Rate of discount = 10%

∴ Total discount = Rs. 3,200 $\times \dfrac{10}{100}$ = Rs. 320

(i)Selling price = Rs. 3,200 – Rs. 320 = Rs. 2,880

(ii)Gain = S.P. – C.P.

= Rs. 2,880 – Rs. 2,500 = Rs. 380

∴ Gain % = $\dfrac{gain \times 100}{C.P.}$ = $\dfrac{380 \times 100}{2500}$

= $\dfrac{76}{5}$ = $15\dfrac{1}{5}$% = 15·2%

Question 8.
A sells his goods at 15% discount. Find the price of an article which is sold for Rs. 680.

Solution:

S.P. of an article = Rs. 680

Rate of discount = 15%

Let M.P. of the article = Rs. 100

∴ S.P. = Rs. 100 – 15 = Rs. 85

If S.P. is Rs. 85, then M.P. = Rs. 100

and if S.P. is Rs. 680, then M.P.

$$= Rs. \frac{100 \times 680}{85} = Rs. \ 800$$

Question 9.
A shopkeeper allows 20% discount on the marked price of his articles. Find the marked price of an article for which he charges Rs. 560.

Solution:

Let Marked Price (M.P.) = Rs. 100

Discount = 20%

∴ S.P. of that article = Rs. 100 – 20 = Rs. 80.

If S.P. is Rs. 80, then marked price = Rs. 100

and if S.P. is Rs. 560, then marked price

$$= Rs. \frac{100 \times 560}{80} = Rs. \ 700$$

Question 10.
An article is bought for Rs. 1,200 and Rs. 100 is spent on its transportation, etc.
Find :
(i) the total C.P. of the article.
(ii) the selling price of it in order to gain 20% on the whole.

Solution:
C.P. of an article = Rs. 1200
Amount spent on transportation = Rs. 100
(*i*) Total C.P. of that article = Rs. 1200 + 100
= Rs. 1300

(*ii*) Gain = 20%, S.P. $= \dfrac{\text{C.P.} \times (100 + \text{gain\%})}{100}$

$= \dfrac{1300 \times (100 + 20)}{100} = \dfrac{1300 \times 120}{100} =$ Rs. 1560

Question 11.
40 pens are bought at 4 for Rs. 50 and all of them are sold at 5 for Rs. 80
Find :
(i) C.P. of one pen.
(ii) S/P. of one pen.
(iii) Profit made by selling one pen.
(iv) Profit percent made by selling one pen.
(v) C.P. of 40 pens
(vi) S.P. of 40 pens.
(vii) Profit made by selling 40 pens.
(viii) Profit percent made by selling 40 pens. Are the results of parts (iv) and (viii)
same? What conclusion do you draw from the above result ?

Solution:

(i) C.P. of 4 pens = Rs. 50

∴ C.P. of 40 pens = $\dfrac{50 \times 40}{4}$ = Rs. 500

and C.P. of 1 pen = $\dfrac{500}{40}$ = Rs. $\dfrac{25}{2}$ = Rs. 12.50

(ii) S.P. of pens = Rs. 80

∴ S.P. of 1 pen = Rs. $\dfrac{80}{5}$ = Rs. 16

(iii) Profit on one pen = S.P. – C.P.
= Rs. 16.00 – 12.50 = Rs. 3.50

(iv) Profit percent = $\dfrac{\text{Profit} \times 100}{\text{C.P.}}$

= $\dfrac{3.50 \times 100}{12.50}$ = $\dfrac{350 \times 100}{1250}$ = 28%

(v) C.P. of 40 pens = 40 × 12.50 = Rs. 500
(vi) S.P. of 40 pens = 40 × 16 = Rs. 640
(vii) Profit on 40 pens = S.P. – C.P.
= Rs. 640 – 500 = Rs. 140

(viii) Profit on 40 pens = $\dfrac{\text{Profit} \times 100}{\text{C.P.}}$ = $\dfrac{140 \times 100}{500}$

= 28%

Yes, the results of (iv) and (viii) are same.
We see that profit of on equal number of articles remains the same.

Question 12.
The C.P. of 5 identical articles is equal to S.P. of 4 articles. Calculate the profit percent or loss percent made if all the articles bought are sold.

Solution:

C.P. of 5 articles = S.P. of 4 articles

Let C.P. of 5 articles = S.P. of 4 articles= Rs. 100

$$\therefore \text{ C.P. of 1 articles} = \text{Rs. } \frac{100}{5} = \text{Rs. } 20$$

$$\text{and S.P. of 1 article} = \text{Rs. } \frac{100}{4} = \text{Rs. } 25$$

$$\therefore \text{Profit} = \text{S.P.} - \text{C.P.} = \text{Rs. } 25 - \text{Rs. } 20 = \text{Rs. } 5$$

$$\therefore \text{ Profit \%} = \frac{\text{Profit} \times 100}{\text{C.P.}} = \frac{5 \times 100}{20} = 25\%$$

Question 13.
The C.P. of 8 pens is same as S.P. of 10 pens. Calculate the profit or loss percent made, if all the pens bought are considered to be sold

Solution:

C.P. of 8 pens = S.P. of 10 pens = Rs. 100
(suppose)

$$\therefore \text{ C.P. of 1 pen} = \frac{100}{8} = \text{Rs. } 12.50$$

$$\text{and S.P. of 1 pen} = \frac{100}{10} = \text{Rs. } 10$$

$$\therefore \text{Loss} = \text{C.P.} - \text{S.P.} = \text{Rs. } 12.50 - \text{Rs. } 10 = \text{Rs. } 2.50$$

$$\text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}} = \frac{2.50 \times 100}{12.50}$$

$$= \frac{250 \times 100 \times 100}{1250 \times 100} = 20\%$$

Question 14.
A certain number of articles are bought at Rs. 450 per dozen and all of them are sold at a profit of 20%. Find the S.P. of:
(i) one article
(ii) seven articles.

Solution:

C.P. of 1 dozen articles = Rs. 450
Profit = 20%

$$\therefore \text{ S.P. } = \frac{\text{C.P.} \times (100 + \text{Profit})}{100}$$

$$= \text{Rs. } \frac{450 \times (100 + 20)}{100} = \text{Rs. } \frac{450 \times 120}{100} = \text{Rs. } 540$$

(i) ∴ S.P. of 1 article = Rs. $\frac{540}{12}$ = Rs. 45

(ii) S.P. of 7 articles = Rs. 45 × 7 = Rs. 315

Question 15.
An article is marked 60% above the cost price and sold at 20% discount. Find the profit percent made.

Solution:

Let cost price of an article = Rs. 100
∴ Marked price = Rs. 100 + 60 = Rs. 160
Rate of discount = 20%

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

$$= \frac{160 \times (100 - 20)}{100} = \frac{160 \times 80}{100} = \text{Rs. } 128$$

Profit = S.P. – C.P.
= Rs. 128 – 100 = Rs. 28

$$\therefore \text{ Profit \% } = \frac{\text{Profit} \times 100}{\text{C.P.}} = \frac{28 \times 100}{100} = 28\%$$