Profit and Loss
Ex 10A

IMPORTANT FACTS

Cost Price:

The price, at which an article is purchased, is called its **cost price**, abbreviated as **C.P.**

Selling Price:

The price, at which an article is sold, is called its **selling prices**, abbreviated as **S.P.**

Profit or Gain:

If S.P. is greater than C.P., the seller is said to have a **profit** or **gain**.

Loss:

If S.P. is less than C.P., the seller is said to have incurred a **loss**.

IMPORTANT FORMULAE

1. Gain = (S.P.) - (C.P.)
2. Loss = (C.P.) - (S.P.)
3. Loss or gain is always reckoned on C.P.
4. Gain Percentage: (Gain %)

$$\text{Gain \%} = \left(\frac{\text{Gain} \times 100}{\text{C.P.}}\right)$$

5. Loss Percentage: (Loss %)

$$\text{Loss \%} = \left(\frac{\text{Loss} \times 100}{\text{C.P.}}\right)$$

6. Selling Price: (S.P.)

$$\text{SP} = \left[\frac{(100 + \text{Gain \%})}{100} \times \text{C.P}\right]$$

7. Selling Price: (S.P.)

$$\text{SP} = \left[\frac{(100 - \text{Loss \%})}{100} \times \text{C.P.}\right]$$

8. Cost Price: (C.P.)

$$\text{C.P.} = \left[\frac{100}{(100 + \text{Gain \%})} \times \text{S.P.}\right]$$

9. Cost Price: (C.P.)

$$\text{C.P.} = \left[\frac{100}{(100 - \text{Loss \%})} \times \text{S.P.}\right]$$

10. If an article is sold at a gain of say 35%, then S.P. = 135% of C.P.
11. If an article is sold at a loss of say, 35% then S.P. = 65% of C.P.
12. When a person sells two similar items, one at a gain of say x%, and the other at a loss of x%, then the seller always incurs a loss given by:

$$\text{Loss \%} = \left(\frac{\text{Common Loss and Gain \%}}{10}\right)^2 = \left(\frac{x}{10}\right)^2.$$

13. If a trader professes to sell his goods at cost price, but uses false weights, then

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

Q1.

Answer :

(i)

$\text{CP} = \text{Rs. } 620$
$\text{SP} = \text{Rs. } 713$
$\text{Since SP} > \text{ CP, there is a gain.}$
$\text{Gain } = 713 - 620 = \text{ Rs. } 93$
$\text{Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{93}{620} \times 100\right)\%$
$= 15\%$

(ii)

$\text{CP} = \text{Rs } 675$
$\text{SP} = \text{Rs } 630$
$\text{Since SP} < \text{ CP, there is a loss.}$
$\text{Loss} = 675 - 630 = \text{ Rs. } 45$
$\text{Loss percentage } = \left(\frac{\text{Loss}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{45}{675} \times 100\right)\%$
$= 6\frac{2}{3}\%$

(iii)

$\text{CP} = \text{Rs. } 345$
$\text{SP} = \text{Rs. } 372.60$
$\text{Since SP} > \text{ CP, there is a gain.}$
$\text{Gain} = 372.60 - 345 = \text{ Rs. } 27.6$
$\text{Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{27.6}{345} \times 100\right)\%$
$= \left(\frac{2760}{345}\right)\%$
$= 8\%$

(iv)

$\text{CP} = \text{Rs } 80$
$\text{SP} = \text{Rs } 76.80$
$\text{Since SP} < \text{ CP, there is a loss.}$
$\text{Loss } = 80 - 76.80 = \text{ Rs. } 3.2$
$\text{Loss percentage} = \left(\frac{\text{loss}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{3.2}{80} \times 100\right)\%$
$= \left(\frac{32}{80} \times 100\right)\%$
$= 4\%$

(iii)

$\text{CP} = \text{Rs. } 875$
$\text{Loss percentage} = 12\%$
$\text{SP} = \frac{(100 - \text{loss } \%)}{100} \times \text{CP}$
$= \frac{(100-12)}{100} \times 875$
$= \frac{77000}{100}$
$= \text{Rs. } 770$

(iv)

$\text{CP} = \text{Rs. } 645$
$\text{Loss percentage} = 13\frac{1}{3}\% = \frac{40}{3}\%$
$\text{SP} = \frac{(100 - \text{loss } \%)}{100} \times \text{CP}$
$= \frac{\left(100 - \frac{40}{3}\right)}{100} \times 645$
$= \frac{\left(\frac{300-40}{3}\right)}{100} \times 645$
$= \left(\frac{260}{3}\right) \times \left(\frac{1}{100}\right) \times 645$
$= \text{Rs. } 559$

Q3.

Answer :

(i)

$\text{SP} = \text{Rs. } 1596$

$\text{Gain percentage} = 12\%$

$\text{CP} = \frac{100}{(100+\text{gain }\%)} \times \text{SP}$

$= \frac{100}{(100+12)} \times 1596$

$= \text{Rs. } 1425$

(ii)

$\text{SP} = \text{Rs. } 2431$

$\text{Loss percentage} = 6\frac{1}{2}\% = \frac{13}{2}\%$

$\text{CP} = \frac{100}{(100-\text{loss }\%)} \times \text{SP}$

$= \frac{100}{\left(100-\frac{13}{2}\right)} \times 2431$

$= \frac{100\times 2}{187} \times 2431$

$= \text{Rs. } 2600$

(iii)

$\text{SP} = \text{Rs. } 657.60$

$\text{Loss percentage} = 4\%$

$\text{CP} = \frac{100}{(100-\text{loss }\%)} \times \text{SP}$

$= \frac{100}{(100-4)} \times 657.60$

$= \text{Rs. } 685$

(iv)

$\text{SP} = \text{Rs. } 34.40$

$\text{Gain percentage} = 7\frac{1}{2}\% = \frac{15}{2}\%$

$\text{CP} = \frac{100}{(100+\text{gain }\%)} \times \text{SP}$

$= \frac{100}{\left(100+\frac{15}{2}\right)} \times 34.40$

$= \frac{100\times 2}{215} \times 34.40$

$= \text{Rs. } 32$

Q4.

Answer :

$\text{CP of the iron safe} = \text{Rs. } 5580$

$\text{Transportation} = \text{Rs. } 170$

$\text{Total CP} = \text{Rs } \left(5580 + 170\right) = \text{Rs. } 5750$

$\text{SP} = \text{Rs. } 6440$

$\text{Since SP} > \text{CP, Manjit makes a profit.}$

$\text{Gain} = 6440 - 5750$

$= \text{Rs } 690$

$\text{Gain percentage} = \left(\frac{\text{gain}}{\text{total CP}} \times 100\right)\%$

$= \left(\frac{690}{5750} \times 100\right)\%$

$= 12\%$

Q5.

Answer :

CP of the car = Rs. 73500
Repairs = Rs. 10300
Insurance = Rs. 2600
Total CP = 73500 + 10300 + 2600 = Rs. 86400
SP = Rs. 84240
Since SP < CP, Robin has a loss.
Loss = 86400 − 84240
= Rs. 2160

$$\text{Loss percentage} = \left(\frac{\text{loss}}{\text{total CP}} \times 100\right)\%$$
$$= \left(\frac{2160}{86400} \times 100\right)\%$$
$$= 2\frac{1}{2}\%$$

Q6.

Answer :

The price of rice is Rs 18 per kg.
According to the question, we have :
Cost for 20 kg of rice = 20 × 18 = Rs. 360
Cost for 25 kg of rice = 25 × 16 = Rs. 400
Total CP = 360 + 400 = Rs. 760
Also, total quantity of rice = 20 + 25 = 45 kg
SP = 45 × 19 = Rs. 855
Since SP > CP, there is a gain.
Now, gain = 855 − 760 = Rs. 95

$$\text{Gain percentage} = \left(\frac{\text{gain}}{\text{total CP}} \times 100\right)\%$$
$$= \left(\frac{95}{760} \times 100\right)\%$$
$$= 12\frac{1}{2}\%$$

Q7.

Answer :

Let 5 kg of coffee be mixed with 2 kg of chicory.

$$\text{CP of the mixture} = \text{Rs}\left(250 \times 5 + 75 \times 2\right)$$
$$= \text{Rs}\left(1250 + 150\right)$$
$$= \text{Rs. } 1400$$
$$\text{SP of the mixture} = \text{Rs}\left(7 \times 230\right) = \text{Rs. } 1610$$

Since SP > CP, there is a gain.

$$\text{Now, gain} = \text{Rs}\left(1610 - 1400\right)$$
$$= \text{Rs. } 210$$
$$\text{Gain percentage} = \left(\frac{\text{gain}}{\text{total CP}} \times 100\right)\%$$
$$= \left(\frac{210}{1400} \times 100\right)\%$$
$$= 15\%$$

Q8.

Answer :

Let Rs x be the SP of each bottle and Rs y be the CP of each bottle.
SP of 16 bottles = CP of 17 bottles
$\Rightarrow 16x = 17y$
$\Rightarrow \frac{x}{y} = \frac{17}{16}$
Gain per bottle = SP − CP
$= \text{Rs}\left(x - y\right)$

$$\therefore \text{Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{x-y}{y} \times 100\right)\%$$
$$= \left\{\left(\frac{x}{y} - 1\right) \times 100\right\}\%$$
$$= \left\{\left(\frac{17}{16} - 1\right) \times 100\right\}\%$$
$$= \left(\frac{1}{16} \times 100\right)\%$$
$$= 6\frac{1}{4}\%$$

Q9.

Answer :

Let Rs x be the CP of one candle and Rs. y be the SP of one candle.
Now, CP of 12 candles = SP of 15 candles
$\Rightarrow 12x = 15y$
$\Rightarrow \frac{y}{x} = \frac{12}{15}$
Loss $=$ CP $-$ SP
$=$ Rs $\left(x - y\right)$
$\therefore$ Loss percentage $= \left(\frac{\text{loss}}{\text{CP}} \times 100\right)\%$
$= \left\{\left(\frac{x-y}{x}\right) \times 100\right\}\%$
$= \left\{\left(1 - \frac{y}{x}\right) \times 100\right\}\%$
$= \left\{\left(1 - \frac{12}{15}\right) \times 100\right\}\%$
$= \left(\frac{3}{15} \times 100\right)\%$
$= 20\%$

Q10.

Answer :

Let Rs x be the SP of one cassette.
SP of 5 cassettes $=$ Rs. $5x$
SP of 125 cassettes $=$ Rs. $125x$
Gain $=$ Rs. 5x, when SP $=$ Rs. $125x$
But gain $=$ SP $-$ CP
$\Rightarrow$ CP $=$ SP $-$ gain
$= 125x - 5x$
$=$ Rs. $120x$
$\therefore$ Gain percentage $= \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{5x}{120x} \times 100\right)\%$
$= 4\frac{1}{6}\%$

Q11.

Answer :

Let Rs x be the SP of one lemon.
SP of 45 lemons $=$ Rs. $45x$
Loss $=$ SP of 3 lemons $=$ Rs. $3x$
But loss $=$ CP $-$ SP
CP $=$ loss $+$ SP
$= 3x + 45x$
$=$ Rs. $48x$
$\therefore$ Loss percentage $= \left(\frac{\text{loss}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{3x}{48x} \times 100\right)\%$
$= 6\frac{1}{4}\%$

Q12.

Answer :

$\text{CP of } 6 \text{ oranges} = \text{Rs. } 10$
$\text{CP of } 1 \text{ orange} = \frac{10}{6} = \text{Rs. } \frac{5}{3}$
$\text{SP of } 4 \text{ oranges} = \text{Rs. } 9$
$\text{SP of } 1 \text{ orange} = \text{Rs. } \frac{9}{4}$
$\text{Since SP} > \text{CP, there is a gain.}$
$\text{Now, gain} = \text{SP} - \text{CP}$
$= \frac{9}{4} - \frac{5}{3}$
$= \text{Rs. } \frac{7}{12}$

$\therefore \text{ Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$

$= \left(\frac{\frac{7}{12}}{\frac{5}{3}} \times 100\right)\%$
$= \left(\frac{7}{12} \times \frac{3}{5} \times 100\right)\%$
$= \left(\frac{7}{4} \times 20\right)\%$
$= 35\%$

Q13.

Answer :

$\text{SP of } 10 \text{ bananas} = \text{Rs. } 18$
$\text{SP of } 1 \text{ banana } = \frac{18}{10} = \text{Rs. } \frac{9}{5}$
$\text{CP of } 12 \text{ bananas} = \text{Rs. } 16$
$\text{CP of } 1 \text{ banana } = \text{Rs } \frac{16}{12} = \text{Rs. } \frac{4}{3}$
$\text{Since SP} > \text{CP, there is a gain.}$
$\text{Now, gain} = \text{SP} - \text{CP}$
$= \frac{9}{5} - \frac{4}{3}$
$= \text{Rs. } \frac{7}{15}$

$\therefore \text{ Gain percentage} = \left(\frac{\frac{7}{15}}{\frac{4}{3}} \times 100\right)\%$

$= \left(\frac{7}{15} \times \frac{3}{4} \times 100\right)\%$
$= 35\%$

Q14.

Answer :

$\text{CP of } 10 \text{ apples} = \text{Rs. } 25$
$\text{SP of } 12 \text{ apples} = \text{Rs. } 25$
$\text{SP of } 10 \text{ apples} = \text{ Rs } \frac{25}{12} \times 10 = \text{Rs. } \frac{125}{6}$
$\text{Since SP} < \text{CP, there is a loss.}$
$\text{Now, loss} = \text{CP} - \text{SP}$
$= \text{Rs } 25 - \frac{125}{6}$
$= \text{Rs. } \frac{25}{6}$

$\therefore \text{ Loss percentage} = \left(\frac{\text{loss}}{\text{CP}} \times 100\right)\%$

$= \left(\frac{\frac{25}{6}}{25} \times 100\right)\%$
$= 16.67\%$

Q15.

Answer :

Let x be number of eggs he purchased.
CP of 3 eggs = Rs. 5
CP of x eggs = Rs. $\frac{5}{3}x$
SP of 5 eggs = 12
SP of x eggs $= \frac{12}{5}x$
$\therefore$ Gain = SP − CP
$= \frac{12}{5}x - \frac{5}{3}x$
= Rs. $\frac{11}{15}x$
Now, $\frac{11}{15}x = 143$
$\Rightarrow x = 143 \div \frac{11}{15}$
$\Rightarrow x = 143 \times \frac{15}{11} \Rightarrow x = 195$

Q16.

Answer :

SP of the camera = Rs. 1080
Let Rs x be the CP.
Gain = Rs. $\frac{1}{8}x$ ... (i)
Also, gain = SP − CP
= Rs. $(1080 - x)$ ... (ii)
From (i) and (ii), we have :
$\frac{1}{8}x = 1080 - x$
$\Rightarrow x = 8640 - 8x$
$\Rightarrow 9x = 8640$
$\Rightarrow x = 960$
$\therefore$ CP = Rs. 960
Now, gain $= \frac{1}{8}x$
$= \frac{960}{8}$
= Rs. 120
$\therefore$ Gain percentage $= \left(\frac{120}{960} \times 100\right)\%$
$= 12\frac{1}{2}\%$

Q17.

Answer :

SP of the pen = Rs. 54
Let Rs x be the CP of the pen.
Loss = Rs. $\frac{x}{10}$
SP = CP − Loss
$= x - \frac{x}{10}$
= Rs. $\frac{9x}{10}$
Now, we have $\frac{9x}{10} = 54$
$\Rightarrow x = 54 \times \frac{10}{9}$
$\Rightarrow x = 60$
$\therefore$ CP of the pen = Rs. 60
Now, loss $= \frac{x}{10}$
$= \frac{60}{10}$
= Rs. 6
$\therefore$ Loss percentage $= \left(\frac{\text{loss}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{6}{60} \times 100\right)\%$
$= 10\%$

Q18.

Answer :

Let $Rs\ x$ *be the* CP of *the* table.
Case I :
Loss percentage $= 10\%$
$\Rightarrow \text{Loss}\,\% = \left(\frac{\text{loss}}{\text{CP}} \times 100\right)\%$
$\Rightarrow 10 = \frac{\text{loss}}{x} \times 100$
$\Rightarrow \frac{\text{Loss}}{x} = \frac{1}{10}$
$\Rightarrow \text{Loss} = \text{Rs}\ \frac{x}{10}$
Suppose that SP_1 is the selling price when he incurs a loss of 10%.
$\text{Loss} = \text{Rs}\ \frac{x}{10}$
$\Rightarrow CP - SP_1 = \frac{x}{10}$
$\Rightarrow SP_1 = x - \frac{x}{10}$
$= \text{Rs}\ \frac{9x}{10}$
Case II :
Gain percentage $= 10\%$
$\Rightarrow \text{Gain}\,\% = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$
$\Rightarrow 10 = \frac{\text{gain}}{x} \times 100$
$\Rightarrow \frac{\text{Gain}}{x} = \frac{1}{10}$
$\Rightarrow \text{Gain} = \text{Rs}\ \frac{x}{10}$
Suppose that SP_2 is the selling price when he makes gain of 10%.

Q19.

Answer :

Let $Rs\ x$ *be the* CP.
Gain_1 percentage $= \left(\frac{\text{gain}_1}{\text{CP}} \times 100\right)\%$
$\Rightarrow 15 = \frac{\text{gain}_1}{x} \times 100$
$\Rightarrow \text{Gain}_1 = \text{Rs}\ \frac{15x}{100}$
Again, gain_2 percentage $= \left(\frac{\text{gain}_2}{\text{CP}} \times 100\right)\%$
$\Rightarrow 8 = \frac{\text{gain}_2}{x} \times 100$
$\Rightarrow \text{Gain}_2 = \text{Rs}\ \frac{8x}{100}$
According to the question, we have :
$\text{Gain}_1 - \text{gain}_2 = 56$
$\Rightarrow \frac{15x}{100} - \frac{8x}{100} = 56$
$\Rightarrow \frac{7x}{100} = 56$
$\Rightarrow 7x = 5600$
$\Rightarrow x = 800$
Hence, the CP of the chair is Rs 800.

Q20.

Answer :

Let the cost price of the cycle be Rs x.

$$\text{SP of the cycle at 10\% gain} = \text{Rs}\left\{\frac{100+\text{gain \%}}{100} \times \text{CP}\right\}$$
$$= \text{Rs}\left\{\frac{100+10}{100} \times x\right\}$$
$$= \text{Rs}\left\{\frac{110x}{100}\right\}$$
$$= \text{Rs.}\ \frac{11x}{10}$$

$$\text{SP of the cycle at } 14\% \text{ gain} = \text{Rs}\left\{\frac{100+14}{100} \times x\right\}$$
$$= \text{Rs}\left\{\frac{114x}{100}\right\}$$
$$= \text{Rs}\left\{\frac{57x}{50}\right\}$$
$$\therefore \frac{57x}{50} - \frac{11x}{10} = 65$$
$$\Rightarrow \left(\frac{57x}{50} - \frac{55x}{50}\right) = 65$$
$$\Rightarrow \frac{57x-55x}{50} = 65$$
$$\Rightarrow \frac{2x}{50} = 65$$
$$\Rightarrow 2x = 3250$$
$$\Rightarrow x = 1625$$

Therefore, the cost price of the cycle is Rs 1625.

Q21.

Answer :

CP of the first variety of wheat = Rs $40 \times 6.25 = \text{Rs. } 250$
CP of second variety of wheat = Rs $30 \times 7 = Rs.\ 210$
Total CP = Rs (250 + 210)
= Rs 460
Total amount of wheat = (40 + 30) kg
= 70 kg

$$\text{Now, gain percentage} = \frac{\text{gain}}{\text{CP}} \times 100$$
$$\Rightarrow \text{Gain} = \frac{(\text{gain \%}) \times \text{CP}}{100}$$
$$\Rightarrow \text{Gain} = \frac{460 \times 5}{100}$$
$$= \text{Rs } 23$$
$$\therefore \text{SP} = \text{CP} + \text{gain}$$
$$= 460 + 23$$
$$= \text{Rs } 483$$

$\therefore$ Rate per kg = Rs $\frac{483}{70} = Rs\ 6.9$

Q22.

Answer :

CP of the first bat = Rs 560
Gain percentage = 15%

$$\text{SP of the first bat} = \text{Rs}\left\{\frac{100+\text{gain \%}}{100} \times \text{CP}\right\}$$
$$= \text{Rs}\left\{\frac{100+15}{100} \times 560\right\}$$
$$= \text{Rs}\left\{\frac{115}{100} \times 560\right\}$$
$$= \text{Rs } 644$$

CP of the second bat = Rs 240
Loss percentage = 5%

$$\text{SP of the second bat} = \text{Rs}\left\{\frac{100-\text{loss \%}}{100} \times \text{CP}\right\}$$
$$= \text{Rs}\left\{\frac{100-5}{100} \times 240\right\}$$
$$= \text{Rs}\left\{\frac{95}{100} \times 240\right\}$$
$$= \text{Rs } 228$$

Total CP of the two bats = Rs (560 + 240) = Rs 800
Total SP of the two bats = Rs (644 + 228) = Rs 872

Since SP >CP, there is gain in the whole transaction.
Now, gain = Rs (872 − 800) = Rs 72

$$\therefore \text{ Gain percentage} = \left\{\frac{\text{gain}}{\text{total CP}} \times 100\right\}\%$$
$$= \left\{\frac{72}{800} \times 100\right\}\%$$
$$= 9\%$$

Wasim gains 9% on the whole transaction.

Q23.

Answer :

CP of one jeans = Rs 725
Gain percentage = 8%

$$\text{SP of one jeans} = \text{Rs}\left\{\frac{100 + \text{gain}\%}{100} \times \text{CP}\right\}$$
$$= \text{Rs}\left\{\frac{100+8}{100} \times 725\right\}$$
$$= \text{Rs}\left\{\frac{108}{100} \times 725\right\}$$
$$= \text{Rs } 783$$

CP of the other jeans = Rs 725
Loss percentage = 4%

$$\text{SP of the other jeans} = \left\{\frac{100-\text{loss}\%}{100} \times \text{CP}\right\}$$
$$= \left\{\frac{100-4}{100} \times 725\right\}$$
$$= \left\{\frac{96}{100} \times 725\right\}$$
$$= \text{Rs } 696$$

Total CP of the two pairs of jeans = Rs (725×2) = Rs 1450
Total SP of the two pairs of jeans = Rs (696 + 783) = Rs1479
Since SP >CP, there is a gain in the whole transaction.

Now, gain = Rs (1479 − 1450) = Rs 29

$$\therefore \text{ Gain percentage} = \left\{\frac{\text{gain}}{\text{to tal CP}} \times 100\right\}\%$$
$$= \left\{\frac{29}{1450} \times 100\right\}\%$$
$$= 2\%$$

Hence, Hema gains 2% on the whole transaction.

Q24.

CP of 1 kg of sugar = Rs 25
C.P of 200 kg sugar= $\text{Rs } (200 \times 25) = \text{Rs } 5000$
CP of 80 kg of sugar=$\text{Rs } (25 \times 80) = \text{Rs } 2000$

CP of 40 kg of sugar = $\text{Rs } (25 \times 40) = \text{Rs } 1000$

$$\text{SP of 80 kg of sugar} = \frac{100+\text{gain}\%}{100} \times \text{CP}$$
$$= \text{Rs } \frac{110}{100} \times 2000$$
$$= \text{Rs } 2200$$

$$\text{SP of 40 kg sugar} = \frac{100-\text{loss}\%}{100} \times \text{CP}$$
$$= \text{Rs } \frac{96}{100} \times 1000$$
$$= \text{Rs } 960$$

$$\text{SP of 200 kg sugar} = \frac{100+\text{gain}\%}{100} \times \text{CP}$$
$$= \text{Rs } \frac{108}{100} \times 5000$$
$$= \text{Rs } 5400$$

Remaining quantity of sugar = (200 − 80 + 40) kg = 80 kg

SP of the remaining sugar (80 kg) = Rs (5400 − 2200 − 960)
= Rs 2240

Q25.

Answer :

Let Rs x be the CP.
Then, SP =Rs $\frac{4x}{3}$
Since SP > CP, there is a gain.

$$\boldsymbol{Now,\ gain\ = SP\ -\ CP}$$
$$= \tfrac{4}{3}\boldsymbol{x}\ -\ \boldsymbol{x}$$
$$= \mathbf{Rs}\ \tfrac{\boldsymbol{x}}{3}$$

$$\therefore\ \mathbf{Gain\ percentage}\ = \left(\tfrac{\boldsymbol{gain}}{\mathbf{CP}} \times 100\right)\%$$
$$= \left(\tfrac{100\times x}{3x}\right)\%$$
$$= 33.33\%$$

Q26.

Answer :

Let CP be Rs $\boldsymbol{x}$.
Then, SP = Rs $\frac{4x}{5}$
Since CP>SP, there is a loss.

$$\mathbf{Loss = CP\ - SP}$$
$$= \boldsymbol{x} - \tfrac{4x}{5} = \mathbf{Rs}\ \tfrac{x}{5}$$
$$\therefore\ \mathbf{Loss\ percentage}\ = \left(\tfrac{\mathbf{loss}}{\mathbf{CP}} \times 100\right)\%$$
$$= \left(\frac{\frac{x}{5}}{x} \times 100\right)\%$$
$$= 20\%$$

Thus, there is a loss of 20%.

Q27.

Answer :

SP of the umbrella = Rs 115.20
Loss = 10%
$$\mathbf{CP\ of\ the\ umbrella}\ = \tfrac{100}{100-\mathbf{loss}} \times \mathbf{SP}$$
$$= \mathbf{Rs}\ \tfrac{100}{100-10} \times 115.20$$
$$= \mathbf{Rs}\ \tfrac{100}{90} \times 115.20$$
$$= \mathbf{Rs}\ 128$$

Now, CP = Rs 128 and desired gain = 5%

$$\therefore\ \mathbf{Desired\ SP} = \tfrac{100+\mathbf{gain\ \%}}{100} \times \mathbf{CP}$$
$$= \mathbf{Rs}\ \tfrac{105}{100} \times 128$$
$$= \mathbf{Rs}\ 134.4$$

Hence, the desired selling price is Rs 134.4

Q28.

Answer :

SP of the bouquet = Rs 322
Gain percentage = 15%

$\textbf{CP of the umbrella} = \left(\frac{100}{100+\text{gain \%}}\right) \times \textbf{SP}$

$= \textbf{Rs } \left(\frac{100}{100+15}\right) \times 322$

$= \textbf{Rs } \frac{100}{115} \times 322$

$= \textbf{Rs } 280$

Now, CP =Rs 128 and desired gain percentage = 25%

$\therefore \textbf{ Desired SP} = \left(\frac{100+\text{gain \%}}{100}\right) \times \textbf{CP}$

$= \textbf{Rs } \frac{125}{100} \times 280$

$= \textbf{Rs } 350$

Hence, the selling price to obtain the desired gain must be Rs 350.

Q29.

Answer :

Let the original price be x.
SP = Rs 3120
Now, SP = CP – loss

$\Rightarrow 3120 = x - \frac{\frac{4}{100}}{x}$

$\Rightarrow 3120 = x - \frac{x}{25}$

$\Rightarrow 3120 = \frac{24x}{25}$

$\Rightarrow \frac{3120 \times 25}{24} = x$

$\Rightarrow x = 3250$

So, the cost price is Rs 3250.

If it is sold for Rs 3445, then its a gain because SP > CP.
Now, gain = SP – CP
= Rs (3445 – 3250)
= Rs 195

$\therefore \textit{ Gain percentage} = \left(\frac{\textit{gain}}{\textit{CP}} \times 100\right)\%$

$= \left(\frac{195}{3250} \times 100\right)\%$

$= 6\%$

Q30.

Answer :

SP of one saree = Rs 2185
Gain percentage = 15%

$\textbf{CP of one saree} = \left\{\frac{100}{100+\text{gain \%}} \times \textbf{SP}\right\}$

$= \textbf{Rs}\left\{\frac{100}{100+15} \times 2185\right\}$

$= \textbf{Rs}\left\{\frac{100}{115} \times 2185\right\}$

$= \textbf{Rs } 1900$

SP of the other saree = Rs 2185
Loss percentage = 5%

$\textbf{CP of the other aree} = \left\{\frac{100}{100-\textit{loss\%}} \times \textit{SP}\right\}$

$= \left\{\frac{100}{100-5} \times 2185\right\}$

$= \left\{\frac{100}{95} \times 2185\right\}$

$= \textbf{Rs } 2300$

Total SP of the two sarees = Rs (2185×2)= Rs 4370
Total CP of the two sarees = Rs (1900 + 2300) = Rs 4200
Since SP >CP, there is a gain in the whole transaction.

Now, gain = Rs (4370 − 4200) = Rs 170

$$\therefore \textbf{ Gain percentage } = \left\{\frac{\text{gain}}{\text{total CP}} \times 100\right\}\%$$
$$= \left\{\frac{170}{4200} \times 100\right\}\%$$
$$= 4\frac{200}{4200}\ \%$$
$$= 4\frac{1}{21}\ \%$$

Hence, Luxmi gains $4\frac{1}{21}\ \%$ in the whole transaction.

Q31.

Answer :

SP of one fan = Rs 990
Gain percentage = 10%

$$\textbf{CP of one fan} = \left\{\frac{100}{100+\text{gain }\%} \times \text{SP}\right\}$$
$$= \left\{\frac{100}{100+10} \times 990\right\}$$
$$= \left\{\frac{100}{110} \times 990\right\}$$
$$= \textbf{Rs. } 900$$

SP of the other fan =Rs 900
Loss percentage = 10%

$$\textbf{Its CP} = \left\{\frac{100}{100-\text{loss }\%} \times \text{SP}\right\}$$
$$= \left\{\frac{100}{100-10} \times 990\right\}$$
$$= \left\{\frac{100}{90} \times 990\right\}$$
$$= \textbf{Rs } 1100$$

Total CP of the two fans = Rs (900 + 1100) = Rs 2000
Total SP of the two fans = Rs (990 + 990) = Rs 1980
Since CP >SP, there is a loss in the whole transaction.
Now, loss = Rs (2000 − 1980) = Rs 20

$$\therefore \textit{ Loss percentage } = \left\{\frac{\textit{loss}}{\textit{total CP}} \times 100\right\}\%$$
$$= \left\{\frac{20}{2000} \times 100\right\}\%$$
$$= 1\%$$

Hence, the shopkeeper incurs a loss of 1% in the whole transaction.

Q32.

Answer :

CP of sugar = Rs 4500
Profit on one-third of the sugar = 10%

CP of one-third of the sugar = Rs $\frac{4500}{3} = \textbf{Rs. } 1500$

$$\textbf{SP of one} - \textbf{third of the sugar } = \frac{100+\text{gain }\%}{100} \times \text{CP}$$
$$= \textbf{Rs } \frac{110}{100} \times 1500$$
$$= \textbf{Rs } 1650$$

Now, profit= Rs (1650 − 1500) = Rs 150

At a profit of 12%, we have:

$$\textbf{SP of sugar } = \frac{100+\text{gain }\%}{100} \times \text{CP}$$
$$= \textbf{Rs } \frac{112}{100} \times 4500$$
$$= \textbf{Rs } 5040$$

∴ Gain= Rs (5040 − 4500) = Rs 5400

Profit on the remaining amount of sugar = Rs (540 − 150) = Rs 390
CP of the remaining sugar = Rs (4500 − 1500) = Rs 3000

$$\text{Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{390}{3000} \times 100\right)\%$$
$$= 13\%$$

Therefore, the profit on the remaining amount of sugar is 13%.

Q33.

Answer :

CP of the land = Rs 96000

CP of two-fifth of the land = $\frac{96000 \times 2}{5} = \text{Rs. } 38400$

$$\text{SP of } \frac{2}{5} \text{ of the land} = \frac{100 - \text{loss}\%}{100} \times \text{CP}$$
$$= \frac{94}{100} \times 38400$$
$$= \text{Rs } 36096$$

Loss = Rs (38400 − 36096) = Rs 2304

At a gain of 10%, we have:

$$\text{SP of the land} = \frac{100 + \text{gain}\%}{100} \times \text{CP}$$
$$= \text{Rs } \frac{110}{100} \times 96000$$
$$= \text{Rs } 105600$$

Gain = Rs (105600 − 96000) = Rs 9600

Profit on the remaining land = Rs (9600 + 2304) = Rs 11904
CP of the remaining land = Rs (96000 − 38400) = Rs 57600

$$\therefore \text{Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{11904}{57600} \times 100\right)\%$$
$$= 20.67\%$$

Therefore, the profit on the remaining part of land is 20.67%.

Q34.

Answer :

SP of the watch for Alex= Rs 1330
Loss percentage for Alex = 5%

$$\text{CP for Alex} = \frac{\text{SP} \times 100}{100 - \text{loss}\%}$$
$$= \frac{1330 \times 100}{100 - 5}$$
$$= \frac{133000}{95}$$
$$= \text{Rs } 1400$$

Now, SP for Vinod = CP for Alex = Rs 1400
Gain percentage of the watch for Vinod = 12%

$$\text{CP of the watch for Vinod} = \frac{\text{SP} \times 100}{100 + \text{gain}\%}$$
$$= \text{Rs } \frac{1400 \times 100}{100 + 12}$$
$$= \text{Rs } \frac{140000}{112} = \text{Rs } 1250$$

Thus, Vinod paid Rs 1250 for the watch.

Profit and Loss
Ex 10B

IMPORTANT FACTS

Cost Price:

The price, at which an article is purchased, is called its **cost price**, abbreviated as **C.P.**

Selling Price:

The price, at which an article is sold, is called its **selling prices**, abbreviated as **S.P.**

Profit or Gain:

If S.P. is greater than C.P., the seller is said to have a **profit** or **gain**.

Loss:

If S.P. is less than C.P., the seller is said to have incurred a **loss**.

IMPORTANT FORMULAE

1. Gain = (S.P.) - (C.P.)
2. Loss = (C.P.) - (S.P.)
3. Loss or gain is always reckoned on C.P.
4. Gain Percentage: (Gain %)

$$\text{Gain \%} = \left(\frac{\text{Gain} \times 100}{\text{C.P.}}\right)$$

5. Loss Percentage: (Loss %)

$$\text{Loss \%} = \left(\frac{\text{Loss} \times 100}{\text{C.P.}}\right)$$

6. Selling Price: (S.P.)

$$\text{SP} = \left[\frac{(100 + \text{Gain \%})}{100} \times \text{C.P}\right]$$

7. Selling Price: (S.P.)

$$\text{SP} = \left[\frac{(100 - \text{Loss \%})}{100} \times \text{C.P.}\right]$$

8. Cost Price: (C.P.)

$$\text{C.P.} = \left[\frac{100}{(100 + \text{Gain \%})} \times \text{S.P.}\right]$$

9. Cost Price: (C.P.)

$$\text{C.P.} = \left[\frac{100}{(100 - \text{Loss \%})} \times \text{S.P.}\right]$$

10. If an article is sold at a gain of say 35%, then S.P. = 135% of C.P.
11. If an article is sold at a loss of say, 35% then S.P. = 65% of C.P.
12. When a person sells two similar items, one at a gain of say x%, and the other at a loss of x%, then the seller always incurs a loss given by:

$$\text{Loss \%} = \left(\frac{\text{Common Loss and Gain \%}}{10}\right)^2 = \left(\frac{x}{10}\right)^2.$$

13. If a trader professes to sell his goods at cost price, but uses false weights, then

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

Q1.

Answer :

Marked price = Rs 4650 and discount = 18%

Discount = 18% of marked price

$$= 18\% \ \ of \ \ Rs \ \ 4650$$

$$= Rs \ \ \left(4650 \times \frac{18}{100}\right) = Rs \ \ 837$$

Selling price = marked price − discount

$$= \text{Rs} \ \ (4650 \ \ - \ \ 837) = \text{Rs} \ \ 3813$$

Therefore, the selling price of the cooler is Rs 3813.

Q2.

Answer :

Marked Price = Rs 960
Selling Price = Rs 816
Discount = MP − SP
= Rs (960 − 816)
= Rs 144
Rate of discount $= 144 \times \frac{100}{960} = 15\,\%$

Therefore, the discount on the sweater is 15%.

Q3.

Answer :

Selling price = $\boldsymbol{Rs\ 546}$
Discount = $\boldsymbol{Rs\ 104}$
Marked Price = ?
Marked Price = selling price + discount
= **Rs** (546 + 104)
= Rs 650

$$\textbf{Rate of discount} = 104 \times \frac{100}{650}$$
$$= 16\%$$

Therefore, the rate of discount given on the shirt is 16%.

Q4.

Answer :

Selling Price = Rs 216.20
Rate of discount = 8%
Marked Price = ?
SP = MP − discount
Let the MP be Rs $\boldsymbol{x}$.

$$\textbf{Now, } x - \frac{8}{100} \times x = 216.20$$
$$\Rightarrow \frac{92x}{100} = 216.20$$
$$\Rightarrow 92x = 21620$$
$$\Rightarrow x = \frac{21620}{92}$$
$$\Rightarrow x = 235$$

∴ Marked price = $\boldsymbol{Rs\ 235}$

Q5.

Answer :

Cost price = Rs 528
Rate of discount = 12%
Marked price = ?
SP= MP − discount
Let the MP be Rs $\boldsymbol{x}$.

$$\textbf{Now, } \frac{x-12}{100\times x} = 528$$
$$\Rightarrow \frac{88x}{100} = 528$$
$$\Rightarrow 88x = 52800$$
$$\Rightarrow x = \frac{52800}{88}$$
$$\Rightarrow x = \textbf{Rs } 600$$

Therefore, the marked price of tea set is Rs 600.

Q6.

Answer :

Let Rs 100 be the CP.
Then, marked price = $\boldsymbol{Rs\ 135}$
Discount = 20% of MP
$= \frac{20}{100} \times 135$
$= 27$
Selling price = marked price − discount
= 135 − 27
= Rs 108
Now, gain = SP − CP
=108 − 100
=Rs 8

$\therefore$ $\textbf{Gain percentage} = \frac{\text{gain}}{\text{CP}} \times 100$

$= \frac{8}{100} \times 100$
$= 8\%$

Q7.

Answer :

Let Rs 100 be the CP.
Then, marked price = $\boldsymbol{Rs\ 140}$
Discount = 30% of MP
$= \frac{30}{100} \times 140$
$= 42$
Selling Price = marked price − discount
= 140 − 42
= Rs 98
Now, loss = CP − SP
= 100 − 98
= Rs 2
$\therefore$ $\boldsymbol{Loss\ percentage} = \frac{Loss \times 100}{CP}$
$= \frac{2 \times 100}{100}$
$= 2\%$

Therefore, the shopkeeper had a loss of 2%.

Q8.

Answer :

Cost price of the fan = $\boldsymbol{Rs\ 1080}$
Gain percentage = 25%
$\therefore$ $\textbf{Selling price} = \left\{\frac{(100 + \text{gain \%})}{100} \times \text{CP}\right\}$
$= \left\{\frac{100+25}{100} \times 1080\right\}$
$= \frac{125}{100} \times 1080$
$= \textbf{Rs } 1350$

Let the marked price be Rs $\boldsymbol{x}$.
Discount = 25% of $\boldsymbol{Rs\ x}$

$= \frac{25x}{100}$

SP = MP − discount
$\Rightarrow$ 1350 = $\boldsymbol{X} - \frac{25X}{100}$

$\Rightarrow 1350 = \frac{100x - 25x}{100}$
$\Rightarrow 135000 = 75x \Rightarrow x = \frac{13500}{75} \Rightarrow x = 1800$

Therefore, the marked price of the fan is $\boldsymbol{Rs\ 1800}$.

Q9.

Answer :

Cost price of the refrigerator = $\boldsymbol{Rs}\ 11515$
Gain percentage = 20%.

$\therefore\ \textbf{Selling price} = \left\{\frac{(100+\textbf{gain \%})}{100} \times \boldsymbol{C.P}\right\}$

$= \left\{\frac{100+20}{100} \times 11515\right\}$

$= \frac{120}{100} \times 11515$

$= \textbf{Rs}\ 13818$

Let the marked price be Rs $\boldsymbol{x}$.
Discount = 16% of $\boldsymbol{Rs}\ \boldsymbol{x}$

$= \frac{16x}{100}$

S.P = MP − Discount

$\Rightarrow$ 13818 = $x - \frac{16x}{100}$

$\Rightarrow 13818 = \frac{100x-16x}{100}$

$\Rightarrow 1381800 = 84x \Rightarrow x = \frac{1381800}{84} \Rightarrow x = 16450$

Therefore, the marked price of the refrigerator is $\boldsymbol{Rs}\ 16450$.

Q10.

Answer :

The cost price of the ring is $\boldsymbol{Rs}\ 1190$.
Gain percentage = 20%.

$\therefore\ \textbf{Selling price} = \left\{\frac{(100+\textbf{gain \%})}{100} \times \boldsymbol{C.P}\right\}$

$= \left\{\frac{100+20}{100} \times 1190\right\}$

$= \frac{120}{100} \times 1190$

$= \textbf{Rs}\ 1428$

Let the marked price be $\boldsymbol{x}$.
Discount = 16% of $\boldsymbol{Rs}\ \boldsymbol{x}$

$= \frac{16x}{100}$

SP = MP − Discount

$\Rightarrow 1428 = x - \frac{16x}{100}$

$\Rightarrow 1428 = \frac{100x-16x}{100}$

$\Rightarrow 142800 = 84x$

$\Rightarrow \frac{142800}{84} = x$

$\Rightarrow x = 1700$

Therefore, the marked price of the ring is $\textbf{Rs}\ 1700$.

Q11.

Answer :

Let $\boldsymbol{Rs}\ 100$ be the cost price.
Gain required = 17%
∴ Selling price = $\boldsymbol{Rs}\ 117$
Let the marked price be $\boldsymbol{Rs}\ \boldsymbol{x}$.
Then, discount = 10% of x

$= \frac{10}{100} \times x$

$= \frac{x}{10}$

Selling Price = MP − discount

$\Rightarrow 117 = x - \frac{x}{10}$

$\Rightarrow 117 = \frac{9x}{10}$

$\Rightarrow 9x = 1170$

$\Rightarrow x = \frac{1170}{9}$

$\Rightarrow x = 130$

∴ Marked price = $\boldsymbol{Rs}\ 130$

Hence, the marked price is 30% above the cost price.

Q12.

Answer :

Let $\boldsymbol{Rs\ 100}$ be the cost price.
Gain required = 8%
Therefore, the selling price is $\boldsymbol{Rs\ 108}$.
Let $\boldsymbol{Rs\ x}$ be the marked price.
Then, discount = 10% of x

$$= \frac{10}{100} \times x$$
$$= \frac{x}{10}$$

Selling Price = MP − discount

$$\Rightarrow 117 = x - \frac{x}{10}$$
$$\Rightarrow 117 = \frac{9x}{10}$$

$$\Rightarrow 9x = 1080$$
$$\Rightarrow x = \frac{1080}{9}$$
$$\Rightarrow x = 120$$

∴ Marked price = $\boldsymbol{Rs\ 120}$

Hence, the marked price is 20% above the cost price.

Q13.

Answer :

Marked price of the TV = Rs 18500
First discount = 20%

$$\textbf{Now, } 20\% \textit{ of } 18500$$
$$= \frac{20}{100} \times 18500$$
$$= \textbf{Rs } 3700$$

Price after the first discount = Rs (18500 − 3700)= Rs 14800
Second discount = 5% of 14800

$$= \frac{5}{100} \times 14800$$
$$= 740$$

Price after the second discount = (14800 − 740)
= Rs 14060
The TV is available for $\textbf{Rs } 14060.$

Q14.

Answer :

Let the marked price of the article be Rs 100.
First discount = 20%
Price after the first discount = (100 − 20) = Rs 80
Second discount = 5% of 80

$$= \frac{5}{100} \times 80$$
$$= \textbf{Rs } 4$$

Price after the second discount = (80 − 4) = Rs 76
Net selling price = Rs 76
∴ Single discount equivalent to the given successive discounts = (100 − 76)% = 24%

Profit and Loss
Ex 10C

Q1.

Answer :

List price of the refrigerator = Rs 14650

Sales tax = 6% of Rs 14650

$= \text{Rs}\ \left(14650 \times \frac{6}{100}\right) = \text{Rs}\ \ 879$

Bill amount = Rs $(14650 + 879)$

$= \text{Rs}\ \ 15529$

Hence, the cost of the refrigerator is Rs 15,529.

Q2.

(i)

$\textbf{Cost of the tie} = \textbf{Rs. } 250$

$\textbf{Sales tax} = 6\%\ \textbf{of Rs } 250$

$= \textbf{Rs.}\left(250 \times \frac{6}{100}\right)$

$= \textbf{Rs. } 15$

$\textbf{Hence, bill amount} = \textbf{Rs } (250 + 15)$

$= \textbf{Rs. } 265$

(ii) $\textbf{Cost of the medicines} = \textbf{Rs. } 625$

$\textbf{Sales tax} = 4\%\ \textbf{of Rs. } 625$

$= \textbf{Rs.}\left(625 \times \frac{4}{100}\right)$

$= \textbf{Rs. } 25$

$\textbf{Hence, bill amount} = \textbf{Rs } (625 + 25)$

$= \textbf{Rs } 650$

(iii) $\textbf{Cost of the cosmetics} = \textbf{Rs } 430$

$\textbf{Sales tax} = 10\%\ \textbf{of Rs } 430$

$= \textbf{Rs}\left(430 \times \frac{10}{100}\right)$

$= \textbf{Rs } 43$

$\textbf{Hence, bill amount} = \textbf{Rs } (430 + 43)$

$= \text{Rs. } 473$

(iv) Cost of clothes $= \text{Rs } 1175$

Sales tax $= 8\%$ of Rs 1175

$= \text{Rs } \left(1175 \times \frac{8}{100}\right)$

$= \text{Rs } 94$

Hence, bill amount $= \text{Rs } (1175 + 94)$

$= \text{Rs. } 1269$

Therefore, total amount to be paid by Reena = bill amount of all the four items

$= \text{Rs } (265 + 650 + 473 + 1269)$

$= \text{Rs } 2657$

Q3.

Answer :

Let the original price of the watch be Rs x.

VAT = 10% of Rs x

$= \text{Rs } \left(x \times \frac{10}{100}\right)$

$= \text{Rs } \frac{10x}{100}$

$\therefore$ Price including VAT = $\text{Rs } \left(x + \frac{x}{10}\right)$

$= \text{Rs } \frac{11x}{10}$

Now, $\frac{11x}{10} = 1980$

$\Rightarrow x = \left(1980 \times \frac{10}{11}\right)$

$= 1800$

Hence, the original price of the watch is Rs 1,800.

Q4.

Answer :

Let the original price of the shirt be Rs x.

VAT = 7% of Rs x

$= \text{Rs. } \left(x \times \frac{7}{100}\right)$

$= \text{Rs. } \frac{7x}{100}$

$\therefore$ Price including VAT = $\text{Rs. } \left(x + \frac{7x}{100}\right)$

$= \text{Rs. } \frac{107x}{100}$

Now, $\frac{107x}{100} = 1337.50$

$\Rightarrow x = \text{Rs } \left(1337.50 \times \frac{100}{107}\right)$

$= \text{Rs } 1250$

Hence, the original price of the shirt is Rs 1,250.

Q5.

Answer :

Let the price of 10 g of gold be Rs x.

VAT $= 1\%$ of Rs x

$= \text{Rs } \left(x \times \frac{1}{100}\right)$

$= \text{Rs } \frac{x}{100}$

$\therefore$ Price including VAT $= \text{Rs. } \left(x + \frac{x}{100}\right)$

$= \text{Rs } \frac{101x}{100}$

Now, $\frac{101x}{100} = 15756$

$\Rightarrow x = \text{Rs } \left(15756 \times \frac{100}{101}\right)$

$= \text{Rs } 15600$

Hence, the price of 10 g of gold is Rs 15,600.

Q6.

Answer :

Let the original price of the computer be Rs *x*.

$\mathbf{VAT} = 4\% \ \mathbf{of} \ \mathbf{Rs.}\, x$

$= \mathbf{Rs.}\left(x \times \frac{4}{100}\right)$

$= \mathbf{Rs.}\, \frac{4x}{100}$

∴ Price including VAT $= \mathbf{Rs.}\left(x + \frac{4x}{100}\right)$

$= \mathbf{Rs.}\, \frac{104x}{100}$

$\mathbf{Now,} \ \frac{104x}{100} = 37960$

$\Rightarrow x = \left(37960 \times \frac{100}{104}\right)$

$= 36500$

∴ The original price of the computer is Rs 36,500

Q7.

Answer :

Let the original cost of the spare parts be Rs *x*.

$\text{VAT} = 12\% \ \text{ of } \ \text{Rs}.x \qquad = \text{Rs}.\left(x \times \frac{12}{100}\right) \qquad = \text{Rs}.\frac{12x}{100}$

∴ Price including VAT $= \text{Rs}.\left(x + \frac{12x}{100}\right)$

$= \text{Rs}.\frac{112x}{100}$

Now, $\frac{112x}{100} = 20776 \Rightarrow x = \left(20776 \times \frac{100}{112}\right) \qquad = 18550$

Hence, the original cost of the spare parts is Rs 18,550.

Q8.

Answer :

Let the list price of the TV set be Rs *x*.

$\mathbf{VAT} = 8\% \ \mathbf{of} \ \mathbf{Rs.}\, x$

$= \mathbf{Rs.}\left(x \times \frac{8}{100}\right)$

$= \mathbf{Rs.}\, \frac{8x}{100}$

∴ Price including VAT $= \mathbf{Rs.}\left(x + \frac{8x}{100}\right)$

$= \mathbf{Rs.}\, \frac{108x}{100}$

$\mathbf{Now,} \ \frac{108x}{100} = 27000$

$\Rightarrow x = \left(27000 \times \frac{100}{108}\right)$

$= 25000$

Hence, the list price of the TV set is Rs 25,000.

Q9.

Answer :

Let the rate of VAT be *x*%. Then, we have:

$840 + x\% \ of \ 840 = 882$

$\Rightarrow \left(\frac{x}{100} \times 840\right) = 882 - 840$

$\Rightarrow \frac{84x}{10} = 42$

$\Rightarrow x = \left(42 \times \frac{10}{84}\right)$

$= 5$

∴ The rate of VAT is 5%.

Q10.

Answer :

Let the rate of VAT be *x*%. Then, we have:

$$\begin{aligned}
&18500 + x\%\ of\ 18500 = 19980 \\
&\Rightarrow \left(\frac{x}{100} \times 18500\right) = 19980 - 18500 \\
&\Rightarrow 185x = 1480 \\
&\Rightarrow x = \frac{1480}{185} \\
&\quad = 8
\end{aligned}$$

∴ The rate of VAT is 8%.

Q11.

Answer :

Let the rate of VAT be x%. Then, we have:

$$\begin{aligned}
&34000 + x\%\ of\ 34000 = 382500 \\
&\Rightarrow \left(\frac{x}{100} \times 340000\right) = 382500 - 340000 \\
&\Rightarrow 3400x = 42500 \\
&\Rightarrow x = \frac{42500}{3400} \\
&\quad = 12.5
\end{aligned}$$

∴ The rate of VAT is 12.5%.

Profit and Loss RS Ex 10D

Q1.

Answer :

$\left(\mathrm{c}\right) 33\frac{1}{3}\%$

$\mathrm{SP} = \mathrm{Rs}\ 100$

$\mathrm{Gain} = \mathrm{Rs}\ (100 - 75)$

$= \mathrm{Rs}\ 25$

$\therefore\ \mathrm{Gain\ percentage} = \left(\frac{\mathrm{gain}}{\mathrm{CP}} \times 100\right)\%$

$= \left(\frac{25}{75} \times 100\right)\%$

$= 33\frac{1}{3}\%$

Q2.

Answer :

$\left(\mathrm{b}\right) 12\frac{1}{2}\%$

$\mathrm{CP} = \mathrm{Rs}\ 120$

$\mathrm{SP} = \mathrm{Rs}\ 105$

$\mathrm{Loss} = \mathrm{Rs}\ (120 - 105)$

$= \mathrm{Rs}\ 15$

$\therefore\ \mathrm{Loss\ percentage} = \left(\frac{\mathrm{loss}}{\mathrm{CP}} \times 100\right)$

$= \left(\frac{15}{120} \times 100\right)$

$= 12\frac{1}{2}\%$

Q3.

Answer :

$\left(\mathrm{b}\right) 25\%$

$\mathrm{CP} = \mathrm{SP} - \mathrm{Gain}$

$= \mathrm{Rs}\ (100 - 20)$

$= \mathrm{Rs}\ 80$

$\therefore\ \mathrm{Gain\ percentage} = \left(\frac{\mathrm{gain}}{\mathrm{CP}} \times 100\right)\%$

$= \left(\frac{20}{80} \times 100\right)\%$

$= 25\%$

Q4.

Answer :

$\left(\mathrm{d}\right)\ \mathrm{Rs}\ 72$

$\mathrm{SP} = \mathrm{Rs}\ 48$

$\mathrm{Loss} = 20\%$

$\mathrm{Now,\ CP} = \frac{100}{100-\mathrm{loss}\ \%} \times \mathrm{SP}$

$= \mathrm{Rs}\ \left(\frac{100}{(100-\mathrm{loss}\ \%)} \times \mathrm{SP}\right)$

$= \mathrm{Rs}\ \left(\frac{100}{(100-20)} \times 48\right)$

$= \mathrm{Rs}\ \left(\frac{100}{80} \times 48\right)$

$= \mathrm{Rs}\ 60$

$\therefore\ \mathrm{Desired\ SP} = \left\{\frac{(100+\mathrm{gain}\ \%)}{100} \times \mathrm{CP}\right\}$

$= \left\{\frac{(100+20)}{100} \times 60\right\}$

$= \mathrm{Rs}\ \left(\frac{12}{10} \times 60\right)$

$= \mathrm{Rs}\ 72$

Q5.

Answer :

(c) 120%

Let the SP and CP of the article be Rs *x* and *y*, respectively.

Gain percentage = 10%

$\Rightarrow 10 = \frac{x-y}{y} \times 100$

$\Rightarrow y = \frac{10x}{11}$

According to the question, we have:

SP = Rs 2*x*

$\therefore$ Gain percentage = $\frac{\mathrm{gain}}{\mathrm{CP}} \times 100$

$= \frac{2x-\frac{10x}{11}}{\frac{10x}{11}} \times 100$

$= \frac{12}{10} \times 100$

$= 120\%$

Q6.

Answer :

(d) 125%

$\mathrm{Cost\ \ price\ \ of\ a\ banana} = \mathrm{Rs}\ \frac{2}{3}$

$\mathrm{Selling\ \ price\ \ of\ a\ banana} = \mathrm{Rs}\ \frac{3}{2}$

$\mathrm{Now,\ profit} = \mathrm{Rs}\ \left(\frac{3}{2} - \frac{2}{3}\right) = \mathrm{Rs}\ \frac{9-4}{6} = \mathrm{Rs}\ \frac{5}{6}$

$\therefore\ \mathrm{Gain\ \ percentage} = \frac{\mathrm{gain}}{\mathrm{CP}} \times 100$

$= \frac{\left(\frac{5}{6}\right)}{\left(\frac{2}{3}\right)} \times 100$

$= \frac{5}{6} \times \frac{3}{2} \times 100$

$= \frac{5}{4} \times 100$

$= 5 \times 25$

$= 125\%$

Q7.

Answer :

(c) 20%

Let Rs x be the SP of each pen.
SP of 10 pens = CP of 12 pens = Rs $12x$
CP of 10 pens = Rs $10x$
Now, gain = Rs $(12x - 10x)$
= Rs $2x$
$\therefore$ Gain percentage $= \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{2x}{10x} \times 100\right)\%$
$= 20\%$

Q8.

Answer :

(b) 25%

Let the SP of 100 pens be Rs x.
SP of 1 pen = Rs $\frac{x}{100}$
Profit = Rs $\frac{20x}{100}$
= Rs $\frac{x}{5}$
Now, CP $= x - \frac{x}{5}$
$= \frac{4x}{5}$
$\therefore$ Gain percentage $= \frac{\frac{x}{5}}{\frac{4x}{5}} \times 100$
$= 25\%$

Q9.

Answer :

(d) 150%

L. C. M of 5 and $2 = (5 \times 1 \times 2) = 10$
Let 10 be the number of toffees bought.
CP of 5 toffees = Rs 1
CP of 1 toffee = Rs $\left(\frac{1}{5}\right)$
$\therefore$ CP of 10 toffees = Rs $\left(\frac{1}{5} \times 10\right)$
= Rs 2
SP of 2 toffees = Rs 1
SP of 1 toffee = Rs $\left(\frac{1}{2}\right)$
$\therefore$ SP of 10 toffees = Rs $\left(\frac{1}{2} \times 10\right)$
= *Rs.* 5
Gain = Rs $(5 - 2)$
= Rs 3
Gain percentage $= \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$
$= \left(\frac{3}{2} \times 100\right)\%$
$= 150\%$

Q10.

Answer :

(d) 25%

$$\text{L. C. M of } 5 \text{ and } 6 = (5 \times 1 \times 6) = 30$$
$$\text{Let } 30 \text{ be the number of oranges bought.}$$
$$\text{CP of } 5 \text{ oranges} = \text{Rs } 10$$
$$\text{CP of } 1 \text{ oranges} = \text{Rs } \left(\frac{10}{5}\right)$$
$$= \text{Rs } 2$$
$$\therefore \text{ CP of } 30 \text{ oranges} = \text{Rs } (2 \times 30)$$
$$= \text{Rs } 60$$
$$\text{SP of } 6 \text{ oranges} = \text{Rs } 15$$
$$\text{SP of } 1 \text{ oranges} = \text{Rs } \left(\frac{15}{6}\right)$$
$$\therefore \text{ SP of } 30 \text{ oranges} = \text{Rs } \left(\frac{15}{6} \times 30\right)$$
$$= \text{Rs } 75$$
$$\text{Now, gain} = \text{Rs } (75 - 60)$$
$$= \text{Rs } 15$$
$$\therefore \text{ Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{15}{60} \times 100\right)\%$$
$$= 25\%$$

Q11.

Answer :

(a) 4%

$$\text{SP of the radio} = \text{Rs } 950$$
$$\text{Loss} = 5\%$$
$$\text{CP} = \left\{\frac{100}{(100 - \text{loss})} \times \text{SP}\right\}$$
$$= \text{Rs } \left\{\frac{100}{(100-5)} \times 950\right\}$$
$$= \text{Rs } \left(\frac{100}{95} \times 950\right)$$
$$= \text{Rs } 1000$$
$$\text{Now, gain} = \text{Rs } (1040 - 1000)$$
$$= \text{Rs } 40$$
$$\therefore \text{ Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{40}{1000} \times 100\right)\%$$
$$= 4\%$$

Q12.

Answer :

(a) 20%

$$\text{Let Rs } x \text{ be the CP of each article.}$$
$$\text{SP of an article} = \text{Rs } \frac{6}{5}\text{x}$$
$$\text{Now, gain} = (\text{SP} - \text{CP})$$
$$= \text{Rs } \left(\frac{6}{5}\text{x} - \text{x}\right)$$
$$= \text{Rs } \frac{\text{x}}{5}$$
$$\therefore \text{ Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{\frac{\text{x}}{5}}{\text{x}} \times 100\right)\%$$
$$= \left(\left(\frac{\text{x}}{5} \times \frac{1}{\text{x}}\right) \times 100\right)\%$$
$$= 20\%$$

Q13.

Answer :

(b) Rs.1200

$$\text{SP} = \text{Rs } 720$$
$$\text{Loss percentage} = 25\%$$
$$\text{CP} = \left\{\frac{100}{(100-\text{loss }\%)} \times \text{SP}\right\}$$
$$= \text{Rs } \left\{\frac{100}{(100-25)} \times \text{SP}\right\}$$
$$= \text{Rs } \left(\frac{100}{85} \times 720\right)$$
$$= \text{Rs } 960$$
$$\therefore \text{ Desired SP} = \left\{\frac{(100+\text{gain }\%)}{100} \times \text{CP}\right\}$$
$$= \text{Rs.} \left\{\frac{(100+25)}{100} \times 960\right\}$$
$$= \text{Rs.} \left(\frac{125}{100} \times 960\right)$$
$$= \text{Rs. } 1200$$

Q14.

Answer :

(a) 5%

$$\text{CP} = \text{Rs. } 20x$$
$$\text{SP} = \text{Rs. } 21x$$
$$\text{Gain} = \text{Rs. } (21 - 20)$$
$$= \text{Rs. x}$$
$$\therefore \text{ Gain percentage} = \left(\frac{\text{gain}}{\text{CP}} \times 100\right)\%$$
$$= \left(\frac{\text{x}}{20\text{x}} \times 100\right)\%$$
$$= 5\%$$

Q15.

Answer :

(a) 1.5% gain

$$\text{SP of the first chair} = \text{Rs } 500$$
$$\text{Gain percentage} = 20\%$$
$$\therefore \text{ CP of the first chair} = \left\{\frac{100}{(100+\text{gain }\%)} \times \text{SP}\right\}$$
$$= \text{Rs.} \left\{\frac{100}{(100+20)} \times 500\right\}$$
$$= \text{Rs.} \left(\frac{100}{120} \times 500\right)$$
$$= \text{Rs. } 416.67$$

$$\text{SP of the second chair} = \text{Rs. } 500$$
$$\text{Loss percentage} = 12\%$$
$$\therefore \text{ CP of the second chair} = \left\{\frac{100}{(100-\text{loss }\%)} \times \text{SP}\right\}$$
$$= \text{Rs.} \left\{\frac{100}{(100-12)} \times 500\right\}$$
$$= \text{Rs.} \left(\frac{100}{88} \times 500\right)$$
$$= \text{Rs. } 568.18$$

$$\text{Total CP of the two chairs} = \text{Rs. } (416.67 + 568.18)$$
$$= \textit{Rs.}\ 984.85$$

$$\textit{Total SP of the two chairs} = \textit{Rs.}\ (500 \times 2)$$
$$= \textit{Rs.}\ 1000$$

Since SP > CP, there is a gain in the whole transaction.

$$\textit{Now, gain} = \textit{Rs.}\ (1000 - 984.85)$$
$$= \textit{Rs.}\ 15.15$$
$$\therefore \textit{ Gain percentage} = \left(\frac{\textit{gain}}{\textit{CP}} \times 100\right)\%$$
$$= \left(\frac{15.15}{984.85} \times 100\right)\%$$
$$= 1.5\%$$

Q16.

Answer :

(b) Rs 530

Let the CP be Rs x.
Then, we have :
$625 - x = x - 435$
$\Rightarrow x + x = 625 + 435$
$\Rightarrow 2x = 1060$
$\therefore x =$ Rs 530

Q17.

Answer :

(c) Rs 198

$\text{CP} = \text{Rs } 150$
$\text{Total CP} = \text{Rs } (150 + 10\% \text{ of } 150)$
$= \text{Rs } \left(150 + \left(\frac{10}{100} \times 150\right)\right)$
$= \text{Rs } (150 + 15)$
$= \text{Rs } 165$
$\therefore \text{ Desired SP} = \left\{\frac{(100+\text{gain }\%)}{100} \times \text{total CP}\right\}$
$= \text{Rs.} \left\{\frac{(100+20)}{100} \times 165\right\}$
$= \text{Rs.} \left(\frac{120}{100} \times 165\right)$
$= \text{Rs. } 198$

Q18.

Answer :

(a) Rs. 50

Let the CP be Rs x. Then, we have :
$(105\% \text{ of } \mathbf{x}) - (95\% \text{ of } \mathbf{x}) = 5$
$\Rightarrow \left(\frac{105}{100} \times \mathbf{x}\right) - \left(\frac{95}{100} \times \mathbf{x}\right) = 5$
$\Rightarrow \left(\frac{105\mathbf{x}}{100} - \frac{95\mathbf{x}}{100}\right) = 5$
$\Rightarrow \frac{(105\mathbf{x} - 95\mathbf{x})}{100} = 5$
$\Rightarrow \frac{10\mathbf{x}}{100} = 5$
$\Rightarrow \frac{\mathbf{x}}{10} = 5$
$\Rightarrow \mathbf{x} = 50$
$\therefore \text{CP} = \text{Rs } 50$

Q19.

Answer :

(b) 8%

Let the CP be Rs 100.
Then, marked price = Rs 120
Discount = 10% of MP

$= (10\% \text{ of Rs } 120)$
$= \text{Rs.} \left(120 \times \frac{10}{100}\right)$
$= \text{Rs. } 12$

Now, SP = (MP) − (discount)
$= \text{Rs } (120 - 12)$
$= \text{Rs } 108$
Gain percentage $= (108 - 100)\%$
$= 8\%$

Q20.

Answer :

(c) 1% loss

$\textbf{Let the CP be Rs } 100.$
$\textbf{Then, marked price} = \textbf{Rs } 110$
$\textbf{Discount} = 10\% \textbf{ of MP}$

$$= (10\% \text{ of Rs. } 110)$$
$$= \text{Rs.} \left(110 \times \frac{10}{100}\right)$$
$$= \text{Rs. } 11$$

$\textit{Now, } SP = (MP) - (\textit{discount})$
$= \textit{Rs } (110 - 11)$
$= \textit{Rs } 99$
$\therefore \textit{ Loss percentage} = (100 - 99)\% = 1\%$

Q21.

Answer :

(c) Rs.750

$\textbf{Let the basic price be } x.$
$\textbf{VAT} = 10\% \textbf{ of Rs } x$
$= \text{Rs } \left(\text{x} \times \frac{10}{100}\right)$
$= \text{Rs } \frac{\text{x}}{10}$
$\therefore \textbf{ Price including VAT} = \text{Rs } \left(\text{x} + \frac{\text{x}}{10}\right)$
$= \textit{Rs. } \frac{11x}{10}$

$\text{Now, } \frac{11\text{x}}{10} = 825$
$\Rightarrow x = \left(825 \times \frac{10}{11}\right)$
$\Rightarrow x = 750$

∴ The basic price of the watch is Rs 750.