Percentage

EXERCISE -7.1

Solution-1

(i) 356%

$\Rightarrow \frac{356}{100_{25}} = \frac{89}{25}$

(ii) $2\frac{1}{2}\%$

$\Rightarrow \frac{5}{2}\%$

$\Rightarrow \frac{8}{2 \times 100_{20}} = \frac{1}{40}$

(iii) $16\frac{2}{3}$

$\Rightarrow \frac{50}{3}\%$

$\Rightarrow \frac{50}{3 \times 100_{2}} = \frac{1}{6}$

Solution-2

(i) $\frac{3}{2}$

$\Rightarrow \frac{3}{2} \times 100^{50}\% = 150\%$

(ii) $\frac{9}{20}$

$\Rightarrow \left(\frac{9}{20} \times 100^{4}\right)\% = 36\%$

(iii) $1\frac{1}{4}$

$\rightarrow \left(\frac{5}{4} \times \frac{25}{100}\right)\%$ = 125%.

Solution- 3

(i) $\frac{3}{4}$

$\rightarrow$ 0.75 = Decimal.

When we converting decimals into percentages

then $\rightarrow$ 0.75×100

$\rightarrow$ 75%.

(ii) $\frac{5}{8}$

$\rightarrow$ $0.62\overline{5}$

$\rightarrow$ $0.62\overline{5} \times 100$

$\rightarrow$ $62\frac{5}{2}\%$.

(iii) $\frac{3}{16}$

$\rightarrow$ 0.1875

$\rightarrow$ 0.1875×100

$\rightarrow$ 18.75%.

Sdution-4 :

(i) $\frac{2}{3}$

⇒ 0.6666 → Decimal.

⇒ while converting decimals into percentages we have to multply with 100

⇒ 0.6666 × 100

⇒ 66.66%.

(ii) $\frac{5}{6}$

⇒ 0.83333

⇒ 0.8333 × 100

⇒ 83.33%.

(iii) $\frac{4}{7}$

⇒ 0.5714

⇒ 0.5714 × 100

⇒ 57.14%.

Solution- 5

(i) 17 : 20

$\Rightarrow \frac{17}{20}$

$\Rightarrow \frac{17}{20} \times 100^{5}$

$\Rightarrow 17 \times 5$

$\Rightarrow 85\%$

(ii) 13 : 18

$\Rightarrow \frac{13}{18}$

$\Rightarrow \frac{13}{18} \times 100$

$\Rightarrow 72.22\%$

(iii) 93 : 80

$\Rightarrow \frac{93}{80_{4}} \times 100^{5}$

$\Rightarrow 116.25\%$

Solution-6

(i) 20%

$\Rightarrow \frac{20}{100}$

$\Rightarrow \frac{1}{5}$

$\Rightarrow 0.2$

(ii) 2%

$\Rightarrow \frac{2}{100_{50}}$

$\Rightarrow \frac{1}{50}$

$\Rightarrow 0.02$

(iii) $3\frac{1}{4}\%$

$\Rightarrow \frac{7}{4}$

$\Rightarrow \frac{7}{4 \times 100}$

$\Rightarrow 0.0175$

Solution-7

(i) 27% of ₹50

$\Rightarrow \frac{27}{\cancel{100}_{2}} \times \cancel{50}$

$\Rightarrow \frac{27}{2}$

$\Rightarrow$ ₹ 13.5

(ii) $6\frac{1}{4}\%$ of 25 kg

$\Rightarrow \frac{25}{4}\%$ of 25 kg

$\Rightarrow \frac{\frac{25}{4}}{100} \times 25$

$\Rightarrow \frac{25}{\cancel{4} \times \cancel{100}_{4}} \times \cancel{25}$

$\Rightarrow \frac{25}{16}$ (or) $1\frac{9}{16}$ kg.

$\Rightarrow$ 1.56 kg

Solution-8

(i) 300 g of 2 kg.

2 kg = (2×1000) g = 2000 g.

Required percentage $= \left(\frac{30\cancel{0}}{200\cancel{0}} \times 10\cancel{0}\right)\%$

$= 15\%$

(ii) ₹ 7.50 of ₹ 6

→ ₹ 6 = (6 × 100) paise

Required percentage = $\frac{750}{600} \times 100$

= 125 %

Solution – 9

(i) 50 kg is 65 kg.

Required percentage = $\frac{65}{50} \times 100$

= 130 %

(ii) ₹ 9 is ₹ 4

Required percentage = $\frac{4}{9} \times 100$

= $\frac{400}{9}$

= $44\frac{4}{9}$ %

Solution – 10

(i) $16\frac{2}{3}$ % of number is 25

let the required number be 'x'

According to given condition, $16\frac{2}{3}$ % of x is 25

$\therefore \frac{16\frac{2}{3}}{100} \times x = 25$

$$\Rightarrow \frac{50}{3\times100} \times x = 25$$

$$x = \frac{3\times100\times25}{50}$$

$$x = 150$$

(ii) let the number be 'x'

Given condition is 13.25% of x is 159

$$\frac{13.25}{100} \times x = 159$$

$$x = \frac{159\times100}{13.25}$$

$$x = 1200$$

Solution - II

(i) New number $= \left(1 + \frac{30}{100}\right) \times 60$

[$\because \left(1 + \frac{x}{100}\right)$ of original number]

$$= \left(\frac{100+30}{100}\right) \times 60$$

$$= \frac{13\cancel{0}}{1\cancel{0}\cancel{0}} \times 6\cancel{0}$$

$$= 78$$

(ii) New number $= \left(1 - \frac{x}{100}\right)$ of original

$= \left(1 - \frac{10}{100}\right) \times 750$

$= \left(\frac{100 - 10}{100}\right) \times 750$

$= \frac{90}{100} \times 750$

$= 675$

Solution-12 :

(i) $\left(1 + \frac{x}{100}\right)$ of original = New number

$\left(1 + \frac{15}{100}\right) \times x = 299$

$\left(\frac{100 + 15}{100}\right) \times x = 299$

$\frac{115}{100} \times x = 299$

$x = \frac{299 \times 100}{115}$

$x = 260$

(ii) $\left(1-\frac{18}{100}\right) \times x = 697$

let number be 'x'

$\therefore \left(\frac{100-18}{100}\right) \times x = 697$

$\frac{82}{100} \times x = 697$

$x = \frac{697 \times 100}{82}$

$x = 850$

Sdution-13

(i). let the monthly salary is 'x'

Mr Khanna spent 83% and saved 1870

Savings = 100 − 83

= 17 %.

$\therefore$ 17 % of x = 1870

$\frac{17}{100} \times x = 1870$

$x = \frac{1870 \times 100}{17}$

$= 110 \times 100$

$x = ₹ 11,000$

$\therefore$ Monthly salary is ₹ 11,000 /-

Solution-14 :

Let the total strength of school is 'x'

Given, 38% of the students are girls.

So → 100 − 38

→ 62% is boys.

∴ Number of boys = 1023

i.e, 62% of x = 1023

$$\frac{62}{100} \times x = 1023$$

$$x = \frac{1023 \times 100}{62}$$

$$= 1650$$

Solution-15 :

The price of article increased from ₹960 to ₹1080

Original price = 960

Increase in price = 1080 − 960

= 120

$$\text{Percentage increase} = \frac{\text{Increase in price}}{\text{original value}} \times 100$$

$$= \frac{120}{960} \times 100$$

$$= 12.5\%$$

Solution-16 :

(i) Given, the total no of eligible voters = 1 lakh

= 1,00,000

∴ loser polled = 42 %

∴ winner polled = 100 - 42

= 58 %

Loser lost by 14400 votes

∴ winner - loser = 14,400

58% - 42 % = 14,400

16 % = 14,400

∴ 1%

let the total no of voter polled = x

∴ 16 % of x = 14,400

$\frac{16}{100} \times x = 14,400$

$x = \frac{14,400 \times 100}{16}$

$x = 90,000$

The percentage of voters did not vote

⇒ 1,00,000 - 90,000

⇒ 10,000

i.e., 10 % //

Solution – 17 :

Given Total Candidates = 8000

60% were boys

i.e., $\frac{60}{100} \times 8000 = 4800$

Girls = 8000 – 4800

= 3200

∴ Passed candidates was

80% of boys = $\frac{80}{100} \times 4800$

= 3840

90% of girls = $\frac{90}{100} \times 3200$

= 2880.

∴ Total no of candidates passed in exam

i.e., 3840 + 2880 = 6720

∴ Number of candidates who failed

i.e., 8000 – 6720

= 1280.

Solution – 18 :-

(i) Given, $\frac{1}{4}$ of students failed in both in English and maths ie., 25 %.

35 % students failed in maths

30 % students failed in English.

∴ percentage of students who failed in only maths = 35 % – 25 %

= 10 %.

percentage of students who failed in only english = 30 % – 25 %.

= 5 %.

∴ percentage of students who failed in any of the subjects = 25 + 10 + 5

= 40 %.

(ii) percentage of students who passed in both the subjects = 100 – 40

= 60 %.

(iii) Given no of students who failed only in english = 25 ⇒ 5 % = 25

∴ Total no of students = 100 % = $\frac{100}{5} \times 25$

= 500 //.

Solution-19 :

let the price of the article be "x".

The price of article increased by 16%.

So $\left(1+\frac{16}{100}\right) \times x = 1479$

$\left(\frac{100+16}{100}\right) \times x = 1479$

$\frac{116}{100} \times x = 1479$

$x = \frac{1479 \times 100}{116}$

$x = 1275$

∴ Original price of article is ₹1275 /-

Solution-20 :

Let the prathibha weight is 'x' kg.

Prathiba weight reduced by 15%.

So $\left(1-\frac{15}{100}\right) \times x = 59.5$

$\left(\frac{100-15}{100}\right) \times x = 59.5$

$\frac{85}{100} \times x = 59.5$

$x = \frac{59.5 \times 100}{85}$

$x = 70$

Solution- 21

(i) As per given condition,

shop reduces all its prices by 15%

Let the original price is ₹40

∴ Let the cost of an article is x.

$$\therefore \quad x = 40 - 15\% \text{ of } 40$$

$$= 40 - \frac{15}{100} \times 40$$

$$= 40 - 6$$

$$= 34.$$

(ii) Let the original price be 'x'.

The article sold at ₹ 20.40.

$$\therefore \quad x - 15\% \text{ of } x = 20.40$$

$$x - \frac{15}{100} \times x = 20.40$$

$$\frac{100x - 15x}{100} = 20.40$$

$$\frac{85x}{100} = 20.40$$

$$x = \frac{20.40}{85} \times 100$$

$$x = 24.$$

∴ Original price of article is ₹ 24.

Solution-22 :

The original price is ₹200

Increases by 10%

$\Rightarrow$ 200 + 10% of 200

$\Rightarrow$ $200 + \frac{10}{100} \times 200$

$\Rightarrow$ 200 + 20

$\Rightarrow$ 220.

$\therefore$ Decreases by 10%

$\Rightarrow$ 220 − 10% of 220

$\Rightarrow$ $220 - \frac{10}{100} \times 220$

$\Rightarrow$ 220 − 22

$\Rightarrow$ 198

$\therefore$ original price is 200

Final price is 198.

$\therefore$ No, the final price is not same as original one.

(23)

Let 'x' be the number of parrots initially chandini have.

20% of the parrots flew away and 5% of them died

No. of parrots remaining now $= \left[1 - \left(\frac{20}{100} + \frac{5}{100}\right)\right] \times (x)$

$= 0.75x$

Now,

45% of the remaining parrots were sold

$\Rightarrow$ 55% of remaining parrots were with chandini

Therefore,

No. of parrots chandini is having finally $= \left(\frac{55}{100}\right) \times 0.75x$ — (1)

But given No. of parrots chandini is having $= 33$ — (2)

From (1) & (2),

$'33'$ equal to $\left(\frac{55}{100}\right) 0.75x$

$\Rightarrow 33 = \left(\frac{55}{100}\right) \times (0.75) \times x$

$\Rightarrow \boxed{x = 80}$

$\therefore$ chandini had purchased 80 parrots.

(24)

Let 'x' be the maximum marks

'y' be the minimum pass marks

A candidate gets 36% in examination and fails by 24 marks

$$\Rightarrow \boxed{(0.36)\times(x) = y - 24} \quad \text{---} \quad (1)$$

Another candidate gets 43% in an examination and gets 18 marks more than that of pass marks

$$\Rightarrow \boxed{(0.43)\times(x) = y + 18} \quad \text{---} \quad (2)$$

Solving equation (1) and (2), we get

$$0.36x + 24 = 0.43x - 18$$

$$\Rightarrow \frac{0.07x}{0.07} = \frac{42}{0.07}$$

$$\Rightarrow \boxed{x = 600}$$ Maximum marks

Substituting $x = 600$ in equation (1)

$$\Rightarrow (0.36)\times 600 = y - 24$$

$$\Rightarrow \boxed{y = 240}$$

Percentage of pass marks $= \frac{y}{x} \times 100\%$

$$= \frac{240}{600} \times 100$$

$$\boxed{\% \text{ of pass marks} = 40\%}$$

Solution-23:

let the total no of parrots be 'x'.

Out of them 20% flew away and 5% died.

$\Rightarrow$ i.e., $\left(1 - \frac{20}{100} - \frac{5}{100}\right) \times x$

$\Rightarrow$ $0.75 \times x$.

EXERCISE : 7.2

1.

i) C.P = 400 S.P = 468

As S.P > C.P , profit = S.P − C.P

= 468 − 400

= 68

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

= $\left(\frac{68}{400} \times 100\right)\%$

= 17%

ii) C.P = 13,600 , S.P = 12,104

As C.P > S.P , Loss = C.P − S.P

= 13,600 − 12,104

= 1496

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

= $\left(\frac{1496}{13600} \times 100\right)\%$

= 11 %

2. Given S.P = 1636.25 , gain = 96.25

As Gain = S.P − C.P

C.P = S.P − Gain = 1636.25 − 96.25

= 1540.

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

$= \left(\frac{96.25}{1540} \times 100\right)\%$

$= 6.25\%$

3. Given

S.P = 770 Loss = 110

As Loss = C.P − S.P

C.P = Loss + S.P

= 110 + 770

= 880

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

$= \left(\frac{110}{880} \times 100\right)\%$

$= 12.5\%$

4. C.P of 1 dozen eggs = 9.60

C.P of 25 dozen eggs = (25 × 9.6) = 240

Total no. of eggs = 25 × 12 = 300 eggs

Out of 300 eggs, 30 eggs were broken

So the remaining no. of eggs were 300 − 30 = 270 eggs

Given S.P of each egg = 1

S.P of 270 eggs = 270 × 1 = 270.

As S.P > C.P, he always gets profit (or) gain

So the gain percentage = $\left(\frac{\text{gain}}{C.P} \times 100\right)\%$

Gain = S.P − C.P

= 270 − 240 = 30.

Gain percentage = $\left(\frac{30}{240} \times 100\right)\%$.

= 12.5 %.

5.

C.P of an article = 20,000 + 1400 (repairs)

= 21,400

profit percentage = 20%.

$\frac{\text{profit}}{C.P} \times 100 = 20$.

profit × 100 = 20 × 21,400

(S.P − C.P) = 20 × 214

S.P − 21,400 = 4280.

S.P = 21,400 + 4280

S.P = 25680

Selling price of an article = 25,680/-

6.

C.p of bicycles includes

i) 200 bicycles at 1200/- per bicycle = (200 × 1200) = 240000

ii) 30/- per bicycle on transportation = 200 × 30 = 6000

iii) 4000/- on advertising = 4000

Total cost price of bicycles = 240,000 + 6000 + 4000

= 250,000

S.p of 200 bicycles = 200 × 1750

= 270,000

As. S.p > C.p, there is always a gain

So gain = S.p − C.p

= 270,000 − 250,000

= 20,000

Gain percentage = $\frac{\text{Gain}}{\text{C.p}} \times 100$.

= $\frac{20,000}{250,000} \times 100$

= 8 %.

7.

Let S.p be x,

Then C.p = 90 % of x

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

$$\text{Profit} = \text{S.P} - \text{C.P}$$

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

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

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

$$= \left(\frac{(x/10)}{(9x/10)} \times 100\right)\%$$

$$= \frac{100}{9}\%$$

$$= 11.11\%$$

8. i) C.P of 4 notebooks = ₹ 35

Then C.P. of 1 note book $= \frac{35}{4} = 8.75/-$

S.P of 5 note books = ₹ 58

Then S.P of 1 notebook $= \frac{58}{5} = 11.6/-$

As. S.P > C.P, there is always a gain

$$\text{Gain} = \text{S.P} - \text{C.P} = 11.6 - 8.75$$

$$= 2.85$$

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

$$= \frac{2.85}{8.75} \times 100$$

$$= 32.57\%$$

ii. Number of notebooks to be sold = $\frac{\text{Total profit}}{\text{Profit on one notebook}}$

$= \frac{171}{2.85}$

$= 60$.

9.

Cost price of 3 bananas = ₹1

The C.P of 1 banana = ₹$\frac{1}{3}$ = 0.33

S.P of 4 bananas = ₹1

Then S.P of 1 banana = ₹$\frac{1}{4}$ = 0.25

As C.P > S.P, There is always a loss.

Loss = C.P − S.P

$= \frac{1}{3} - \frac{1}{4}$

$= \frac{1}{12}$

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

$= \frac{(1/12)}{(1/3)} \times 100\ \%$

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

$= 25\ \%$

10. Given S.p of 5 pens = C.p of 7 pens.

Let Cost price of one pen be x then

C.p of 7 pens = ₹ $7x$

It is given

S.p of 5 pens = C.p of 7 pens.

S.p of 5 pens = ₹ $7x$

S.p of one (1) pen = $\frac{7x}{5}$

As. S.p > C.p there is a profit

Profit = S.p − C.p

$= \frac{7x}{5} - x = \frac{2x}{5}$

$\therefore$ Profit percentage = $\frac{\text{Profit}}{\text{C.p}} \times 100$ %

$= \frac{(2x/5)}{x} \times 100$ %

$= \frac{200}{5}$ %

$= 40$ %.

11. i) C.p = 2360, profit = 8%.

As. profit percentage = $\frac{\text{Profit}}{\text{C.p}} \times 100$

$$\text{profit} \times 100 = 8 \times 2360$$

$$\text{profit} = \frac{8 \times 2360}{100}$$

$$S.P - C.P = 188.8$$

$$S.P = 2360 + 188.8$$

$$S.P = 2548.8$$

ii. $C.P = 380$; Loss = 7.5%.

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

$$\text{Loss} = \frac{7.5 \times 380}{100}$$

$$C.P - S.P = 28.5$$

$$S.P = 380 - 28.5$$

$$S.P = 351.5$$

12. C.P of dozen eggs = ₹ 18

Then C.P of 1 egg = $\frac{18}{12}$ = ₹ 1.5

profit = 50%

$$\frac{S.P - C.P}{C.P} \times 100 = 50$$

$$(S.P - C.P) = \frac{50 \times 189}{100}$$

$$S.P - C.P = 9$$

$$S.P = 18 + 9$$

$$S.P = 27$$

$$S.P \text{ of } 1 \text{ egg} = \frac{27}{12} = ₹\ 2.25$$

13.

Let the no of wrist watches are x

Cost price of x wrist watches ₹ 60,000

CP of one third of wrist watches will worth 20,000.

i) As we know $\frac{1}{3}$rd are sold at a 30% profit

$$S.P = \left[1 + \frac{P}{100}\right] \text{ of } C.P$$

$$= \left[1 + \frac{30}{100}\right] \times 20,000$$

$$= \frac{130}{100} \times 20,000$$

$$= 26,000$$

(ii) $$S.P = \left[1 + \frac{P}{100}\right] \text{ of } C.P$$ [∵ As $\frac{1}{3}$rd are sold at 20% gain]

$$= \left[1 + \frac{20}{100}\right] \times 20,000$$

$$= \frac{120}{100} \times 20,000$$

$$= 24,000$$

iii) $S.P = \left(1 - \frac{1}{100}\right)$ of C.P [Remaining are sold at a 5% Loss]

$= \left[1 - \frac{5}{100}\right] \times 20,000$

$= \frac{95}{100} \times 20,000$

$= 19,000$

Total cost price = ₹ 60,000

Selling price = ₹ [26000 + 24,000 + 19,000]

= ₹ 69,000

As S.P > C.P there is always a profit

Gain = S.P − C.P = 69,000 − 60,000

= 9,000/-

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

$= \frac{9,000}{69,000} \times 100$ %

= 15 %.

14. C.P of a Laptop = ₹ 40,000

C.P of a mobile phone = ₹ 24,000.

Total C.P of whole Transaction = 40,000 + 24,000

= 64,000

As shopkeeper made a profit of 8% on laptop

So. $S.P = \left(1+\frac{P}{100}\right)$ of $C.P$

$= \left[1+\frac{8}{100}\right] \times 40,000$

$= \frac{108}{100} \times 40,000$

$= 43,200$

Also, he made a loss of 12% on mobile phone

$S.P = \left[1-\frac{l}{100}\right]$ of $C.P$

$= \left[1-\frac{12}{100}\right] \times 24,000$

$= \frac{88}{100} \times 24,000$

$= 21,120$

Total S.P on whole Transaction $= 43,200 + 21,120$

$= 64,320.$

As, $S.P > C.P$ there is always a gain

Gain $= S.P - C.P = 64,320 - 64,000$

$= 320$

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

$= \frac{32\cancel{0}}{6\cancel{4000}} \times 100$

$= 0.5\%$

16. C.p of 40 chairs $= (40 \times 175) = 7,000$

Desired gain on whole deal $= 10\%$.

S.p of all chairs $= \left[1 + \frac{10}{100}\right] \times 7,000$

$= \frac{110}{100} \times 7,000$

$= 7700$

One-Fourth of all articles $= \frac{1}{4} \times 40 = 10$.

C.p of 10 articles $= 10 \times 175 = 1750$

As these articles are sold at a loss of 8%.

S.p of these articles $= \left[1 - \frac{8}{100}\right]$ of 1750

$= \frac{92}{100} \times 1750$

$= 1,610$

Selling price of remaining i.e 30 chairs $= 7,700 - 1610$

$= 6090/-$

$\therefore$ S.P of each of the remaining chairs $= \frac{6090}{30}$

$= ₹203$

16.

S.P of two electronic gadgets = ₹ 44,000 (each)

For First gadget :

S.P = ₹ 44,000, profit = 10%, C.P = ?

$44,000 = \left(1 + \frac{10}{100}\right)$ of C.P

$C.P = ₹\left(44,000 \times \frac{100}{110}\right) = ₹\ 40,000$

For second gadget :

S.P = 44,000, loss = 12%, C.P = ?

$S.P = \left[1 - \frac{1}{100}\right]$ of C.P

$44,000 = \left[1 - \frac{12}{100}\right]$ of C.P

$C.P = ₹\left[44,000 \times \frac{100}{88}\right] = ₹\ 50,000.$

Then, total cost price = 40,000 + 50,000 = 90,000

Total selling price = 44,000 + 44,000 = 88,000

Loss = C.P − S.P = 90,000 − 88,000 = 2,000.

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

$= \frac{2,000}{99,000} \times 100$

$= \frac{20}{9}$

$= 2.22\%$.

17.

Manufacturing price of a T.V set = ₹12,000

Shopkeeper Sold to a dealer at a profit of 20%.

Now S.P of T.V set $= \left[1 + \frac{20}{100}\right]$ of C.P

$S.P = \frac{120}{100} \times 12,000$

$= 14,000$

Dealer Sold to a Customer at 12.5% profit

Now Dealer's S.P will become Cost price

So, New selling price to Customer

$= \left[1 + \frac{12.5}{100}\right]$ of C.P

$= \frac{112.5}{100} \times 14,000$

$= 16,200$.

So the customer has to pay ₹16,200 for T.V set

18. i) $S.P = 450$, Loss $= 10\%$.

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

$$10 = \left[1 - \frac{S.P}{C.P}\right] \times 100$$

$$1 - \frac{S.P}{C.P} = \frac{1}{10}$$

$$\frac{S.P}{C.P} = 1 - \frac{1}{10} = \frac{9}{10}$$

$$C.P = \frac{450 \times 10}{9}$$

$$C.P = ₹500.$$

ii) $S.P = ₹690$, profit $= 15\%$.

$$S.P = \left[1 + \frac{P}{100}\right] \text{ of } C.P$$

$$690 = \left[1 + \frac{15}{100}\right] \times C.P$$

$$C.P = \frac{690 \times 100}{115}.$$

$$C.P = ₹600.$$

19. If S.P = 3920, gain = 12%.

$$S.P = \left[1 + \frac{P}{100}\right] \text{ of } C.P$$

$$3920 = \left[1 + \frac{12}{100}\right] \times C.P$$

$$C.P = \frac{3920 \times 100}{112}$$

$$C.P = 3,500.$$

Now S.P = 4,375

As S.P > C.P, Gain = S.P − C.P

= 4,375 − 3,500

= 875

$$\text{Gain percentage} = \left[\frac{\text{Gain}}{C.P} \times 100\right]\%$$

$$= \left[\frac{875}{3,500} \times 100\right]\%$$

= 25 %.

20. S.P = ₹1334, Loss = 8%.

$$S.P = \left[1 - \frac{1}{100}\right] \text{ of } C.P$$

$$1334 = \left[1 - \frac{8}{100}\right] \times C.P$$

$$C.P = \frac{1334 \times 100}{92}$$

$$C.P = 21450$$

Given profit $= 12\frac{1}{2}\% = 12.5\%$

Now $S.P = \left[1 + \frac{P}{100}\right] \times C.P$

$$= \left[1 + \frac{12.5}{100}\right] \times 1450$$

$$S.P = \frac{112.5 \times 1450}{100}$$

$$S.P = 21631.25$$

21. $S.P = 252$, Gain $= 5\%$

$$S.P = \left[1 + \frac{P}{100}\right] \times C.P$$

$$C.P = \frac{S.P \times 100}{100 + P}$$

$$= \frac{252 \times 100}{100 + 5}$$

$$C.P = \frac{25200}{105} = 240$$

S.P = ? If gain = 35%

$$S.P = \left[1 + \frac{P}{100}\right] \text{ of } C.P$$

$$= \left[1 + \frac{35}{100}\right] \times 240$$

$$S.P = \frac{135 \times 240}{100}$$

$$S.P = 2324$$

22. Let the selling price of a bag be ₹ x.

Profit = 12%

$$x = \left(1 + \frac{12}{100}\right) \text{ of } C.P$$

$$x = \frac{112}{100} \text{ of } C.P$$

$$C.P = \frac{100x}{112}$$

To make 18% profit

$$S.P = \left[1 + \frac{18}{100}\right] \text{ of } C.P$$

$$= \frac{118}{100} \times \frac{100x}{112} = \frac{59x}{56}$$

According to given information, $\frac{59x}{56} = x + 39$

$$\frac{59x}{56} - x = 39$$

$$\frac{3x}{56} = 39 \div 13$$

$$x = 56 \times 13$$

$$x = 728 = S.P$$

Cost price of bag $= \frac{100 \times x}{112}$

$$= \frac{100 \times 728}{112}$$

Cost price of bag = ₹ 650.

23. Let the S.P of sweater be x, Loss = 5%.

$$x = \left[1 - \frac{5}{100}\right] \text{ of } C.P$$

$$C.P = \frac{100x}{95}$$

To make 15% profit

$$S.P = \left[1 + \frac{15}{100}\right] \text{ of } C.P = \left[1 + \frac{15}{100}\right] \times \frac{100x}{95}$$

$$= \frac{115}{100} \times \frac{100x}{95} = \frac{23x}{19}.$$

According to given information, $\frac{23x}{19} = x + 260$

$$\frac{4x}{19} = 260$$

$$x = 65 \times 19$$

$$x = 1235$$

$\therefore$ Selling price of sweater = 1,235

24.

Let the selling price be "x". Loss = 8%.

$$x = \left[1 - \frac{8}{100}\right] \text{ of C.P}$$

$$C.P = \frac{100x}{92}$$

To make a profit of 12%.

$$S.P = \left[1 + \frac{12}{100}\right] \text{ of C.P} = \left[\frac{112}{100} \times \frac{100x}{92}\right]$$

$$= \frac{28x}{23}.$$

According to given information, $\frac{28x}{23} = x + 150$

$$\frac{5x}{23} = 150^{30}$$

Selling price, $x = 23 \times 30 = ₹690$

EXERCISE : 7.3

1.

i) Marked price = ₹ 575, discount = 12%.

$$\text{Discount percentage} = \left(\frac{\text{Discount}}{\text{Marked price}} \times 100\right)\%$$

$$12 = \frac{\text{Discount}}{575} \times 100$$

$$\text{Discount} = \frac{12 \times 575}{100}$$

$$\text{Discount} = ₹69$$

$$\text{Selling price} = \text{Marked price} - \text{Discount}$$

$$= 575 - 69$$

$$= ₹506$$

ii) Printed price = ₹ 12,750; discount = $8\frac{1}{3}\%$.

$$\text{Discount percentage} = \left(\frac{\text{Discount}}{\text{Marked price}} \times 100\right)\%$$

$$\frac{25}{3} = \frac{\text{Discount}}{12,750} \times 100$$

$$\text{Discount} = \frac{25}{3} \times \frac{12,750}{100} = 1062.5$$

Selling price = Marked price (or) printed price − Discount

= 12,750 − 1062.5

= 11,687.5

2

i) Marked price = ₹ 780 , selling price = ₹ 721.5

Selling price = Marked price − Discount

Discount = Marked price − Selling price

= 780 − 721.5

= ₹ 58.5

Discount percentage = $\frac{\text{Discount}}{\text{Marked price}} \times 100\ \%$

= $\frac{58.5}{780} \times 100\ \%$

= 7.5 %

ii. Advertised price (or) Marked price = ₹ 28,500 selling price = ₹ 24510

Selling price = Marked price − Discount

Discount = Marked price − Selling price

= 28,500 − 24,510

= 3990

Discount percentage = $\frac{\text{Discount}}{\text{marked price}} \times 100$

$$= \frac{3990}{28500} \times 100\ \%$$

$$= 14\ \%$$

3. Marked price = ₹ 30 (each)

$$\text{Discount \%} = \frac{\text{Discount}}{\text{Marked price}} \times 100$$

$$\text{Discount} = \frac{15 \times 30}{100} = 4.5$$

Discount on one notebook = 4.5

Discount on dozen notebooks = $12 \times 4.5 = 54$

Marked price on dozen notebooks = $12 \times 30 = 360$

Selling price = Marked price − Discount

$= 360 - 54$

$= ₹ 306$

4. Selling price = ₹ 728 Discount = 9%

$$\text{S.P} = \left(1 - \frac{9}{100}\right) \text{ of M.P}$$

$$728 = \left(1 - \frac{9}{100}\right) \times \text{M.P}$$

$$\text{M.P} = \frac{728 \times 100}{91} = ₹\ 800$$

5. Marked price = ₹ 800 Discount = 20%.

i) Selling price = ?

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

(OR)

$$\text{S.P} = \left[1 - \frac{d}{100}\right] \text{ of M.P}$$

$$= \left[1 - \frac{20}{100}\right] \times 800$$

$$= \frac{80}{100} \times 800$$

$$\text{S.P} = ₹\ 640$$

ii) Profit = 25 %

$$\text{S.P} = \left[1 + \frac{P}{100}\right] \text{ of C.P}$$

$$640 = \left[1 + \frac{25}{100}\right] \times \text{C.P}$$

$$\text{C.P} = \frac{640 \times 100}{125}$$

$$\text{C.P} = ₹\ 512$$

6. Marked price = ₹ 2,250 Discount = 12% profit = 10%.

i) $$\text{S.P} = \left[1 - \frac{d}{100}\right] \text{ of M.P}$$

$$= \left[1 - \frac{12}{100}\right] \times 2250$$

$= \frac{88}{100} \times 2250$

$= ₹ 1980$

ii) $S.P = \left[1 + \frac{P}{100}\right]$ of $C.P$

$1980 = \left[1 + \frac{10}{100}\right] \times C.P$

$C.P = \frac{1980 \times 100}{110}$

$= ₹ 1800$

7. Cost price = ₹ 650. Discount = 20% profit = 20%

i) $S.P = \left[1 + \frac{P}{100}\right]$ of $C.P$

$= \left[1 + \frac{20}{100}\right] \times 650$

$= \frac{120}{100} \times 650$

$S.P = ₹ 780$

ii) $S.P = \left[1 - \frac{d}{100}\right]$ of $M.P$

$780 = \left[1 - \frac{20}{100}\right] \times M.P$

$M.P = \frac{780 \times 100}{80}$

$M.P = ₹ 975$

8. Cost price = 1200/- profit = 80% on marked Discount = 15%.

i) Marked price = 1200 + (80% of C.P)

$= 1200 + \left(\frac{80}{100} \times 1200\right)$

$= 1200 + 960$

$= 2160/-$

ii) Selling price $= \left[1 - \frac{d}{100}\right] \times M.P$

$= \left[1 - \frac{15}{100}\right] \times 2160$

$= \frac{85}{100} \times 2160$

$= 1836$

iii) Profit percentage $= \left(\frac{SP - C.P}{CP} \times 100\right)\%$

$= \left(\frac{1836 - 1200}{1200} \times 100\right)\%$

$= \frac{636}{1200} \times 100$

$= 53\%$

9 Cost price of an article = ₹ 1600.

i) Since the cost price is 20% below the marked price.

$$C.P = M.P - 20\% \text{ of } M.P$$

$$1600 = M.P - \frac{20}{100} \times M.P$$

$$1600 = \left[1 - \frac{20}{100}\right] \times M.P$$

$$M.P = \frac{1600 \times 100}{80}$$

$$M.P = ₹\ 2000$$

ii) Discount = 16%

$$S.P = \left[1 - \frac{16}{100}\right] \times M.P$$

$$= \left[1 - \frac{16}{100}\right] \times 2000$$

$$= \frac{84}{100} \times 2000$$

$$S.P = 21680$$

iii) Profit percentage $= \left[\frac{S.P - C.P}{C.P} \times 100\right]\%$

$$= \left[\frac{1680 - 1600}{1600} \times 100\right]\%$$

$$= \frac{80}{1600} \times 100\ \%$$

$$= 5\%.$$

10. Discount = 20% profit = 20% Selling price = ₹ 360.

i. $S.P = \left[1 - \frac{d}{100}\right]$ of M.P

$$360 = \left[1 - \frac{20}{100}\right] \times M.P$$

$$M.P = \frac{360 \times 100}{80}$$

$$M.P = ₹\ 450$$

ii) $S.P = \left[1 + \frac{p}{100}\right]$ of C.P

$$360 = \left[1 + \frac{20}{100}\right] \times C.P$$

$$C.P = \frac{360 \times 100}{120}$$

$$C.P = ₹\ 300$$

11. Marked price of a refrigerator = ₹ 28,600.

The selling price of a refrigerator is

$$= \left[1 - \frac{10}{100}\right]\left[1 - \frac{5}{100}\right] \text{ of } M.P \quad \left[\because S.P = \left(1 - \frac{d_1}{100}\right)\left(1 - \frac{d_2}{100}\right) \text{ of } M.P\right]$$

$$= \frac{90}{100} \times \frac{95}{100} \times 28600$$

$$= ₹\ 24,453$$

12 Let the marked price be 'x'

First dealer:

$$S.P = \left[1 - \frac{15}{100}\right]\left[1 - \frac{5}{100}\right] \text{ of } M.P$$

$$= \frac{85}{100} \times \frac{95}{100} \times x$$

$$= \frac{17 \times 19 \times x}{20 \times 20} = 0.8075x$$

Second dealer:

$$S.P = \left[1 - \frac{20}{100}\right] \text{ of } M.P$$

$$= \frac{80}{100} \times x$$

$$= \frac{4x}{5} = 0.8x$$

As the second dealer offer price is less compared to first dealer.

So, The second dealer is best offer.

13. Let the marked price of an article be 'x'. and a single discount of d% be equivalent to two given successive discounts of 30% and 10%, then

$$\left(1 - \frac{d}{100}\right) \text{ of } x = \left(1 - \frac{30}{100}\right)\left(1 - \frac{10}{100}\right) \text{ of } x$$

$$1 - \frac{d}{100} = \frac{70}{100} \times \frac{90}{100}$$

$$1 - \frac{d}{100} = \frac{63}{100}$$

$$\frac{d}{100} = \frac{37}{100}$$

$$d = 37$$

Hence a discount of 37% is equivalent to two given successive discounts.

EXERCISE : 7.4

1.

i) Cost price of a towel = ₹ 50

Sales Tax = 5% of 50 = ₹ $\frac{5}{100} \times 50$

= ₹ 2.5

∴ Buying price = Cost price + Sales Tax

= 50 + 2.5 = ₹ 52.5

ii) Cost price of flour = ₹ 15 per kg

Then Cost price of 5 kg flour = (5 × 15) = ₹ 75

Sales Tax = 5% of 75 = $\frac{5}{100} \times 75$

= ₹ 3.75

∴ Buying price = Cost price + Sales Tax

= 75 + 3.75 = ₹ 78.75

2.

i) Let the original price of T.V be x.

∴ VAT = 8% of x = ₹ $\left(\frac{8}{100} \times x\right)$ = ₹ $\frac{2x}{25}$.

Price including VAT = ₹ $\left(x + \frac{2x}{25}\right)$ = ₹ $\frac{27x}{25}$

∴ $\frac{27x}{25}$ = 13,500

$$x = \frac{13,500 \times 25}{27}$$

$$= ₹ 12,500.$$

ii)

Now $\frac{27x}{25} = 180$

$$x = \frac{180 \times 25}{27}$$

$$x = ₹ 166.67$$

3. Let the original price of A.C. be ₹ x.

$\therefore$ VAT = 8% of x = $\frac{2x}{25}$

price including VAT = $₹ \left(x + \frac{2x}{25}\right) = ₹ \frac{27x}{25}$

$\therefore \frac{27x}{25} = 34,992$

$$x = \frac{34,992 \times 25}{27}$$

$$x = ₹ 32,400.$$

4. price including VAT = ₹ 1296.

Original price of shirt = ₹ 1200

Let VAT be 'x'

Price including VAT = x% of original price + original price

$$1296 = \left(\frac{x}{100} \times 1200 + 1200\right)$$

$$12x = 1296 - 1200$$

$$12x = 96$$

$$x = 8\%$$

$\therefore$ VAT = 8%.

5.

Price of purse including 8% VAT = 523.8

Let the original price be x

$\therefore$ Price including VAT = original price + 8% of original price

$$523.8 = x + 8\% \text{ of } x$$

$$523.8 = x + \frac{8x}{100} = x + \frac{2x}{25}$$

$$\frac{27x}{25} = 523.8$$

$$x = £485$$

Now VAT increased by 10%.

New selling price = 485 + 10% of 485

$$= 485 + \frac{10}{100} \times 485$$

$$= 485 + 48.5$$

$= ₹ 533.5$

$\therefore$ New selling price of purse $= ₹ 533.5$

6. Marked price $= ₹ 4800$

Rate of discount $= 10\%$

$$\text{Discount} = \frac{10}{100} \times 4,800 = ₹ 480$$

S.P of wall hanging = M.P − Discount

$= 4,800 - 480$

$= ₹ 4,320$

Now VAT 8% of 4320 $= ₹ \frac{8}{100} \times 4320 = 345.6$

Bill amount $= ₹ 4,320 + 345.6 = ₹ 4665.6$

Hence, the customer has to pay ₹4665.6 in Cash to purchase

7. Let the reduced price of washing machine be ₹ x

$$\text{VAT} = 9\% \text{ of } x = ₹ \left(\frac{9}{100} \times x\right) = ₹ \frac{9x}{100}$$

$$\text{Amount paid by Amit} = x + \frac{9x}{100} = ₹ \frac{109x}{100}$$

As Amit has 10,900 to purchase it,

$$\therefore \frac{109x}{100} = 10,900 \Rightarrow x = \frac{10,900 \times 100}{109} = 10,000$$

∴ The reduced price of washing machine = ₹ 10,000.

So, amount reduced = 10,900 − 10,000

= ₹ 900.

Hence, the amount reduced by shopkeeper is ₹ 900