Percentage and Its applications

EXERCISE : 7.1

1.

i) $25\% = \frac{25}{100} = \frac{1}{4}$

ii) $150\% = \frac{150}{100} = \frac{3}{2}$.

iii) $7\frac{1}{2}\% = \frac{15}{2}\% = \frac{15/2}{100} = \frac{15}{2\times100} = \frac{3}{40}$

iv) $33\frac{1}{3}\% = \frac{100}{3}\% = \frac{100/3}{100} = \frac{100}{3\times100} = \frac{1}{3}$.

2.

i) $\frac{1}{8} = \left(\frac{1}{8}\times100\right)\% = 12.5\%$

ii) $\frac{5}{4} = \left(\frac{5}{4}\times100\right)\% = 125\%$

iii) $\frac{9}{16} = \left(\frac{9}{16}\times100\right)\% = 56\frac{1}{4}\%$

iv) $\frac{3}{7} = \left(\frac{3}{7}\times100\right)\% = 42\frac{6}{7}\%$

v) $\frac{11}{15} = \left(\frac{11}{15}\times100\right)\% = 73\frac{1}{3}\%$

vi) $1\frac{3}{8} = \frac{11}{8} = \left(\frac{11}{8}\times100\right)\% = 137\frac{1}{2}\%$

3.

i) Given 6 students out of 40 students in a class are absent

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Percentage of students are absent $= \frac{\overset{3}{\cancel{6}}}{\underset{20}{\cancel{40}}} \times \overset{5}{\cancel{100}}$ %

$= 15$ %.

ii) Given, Antony secured 384 marks out of 500 marks.

$\therefore$ Percentage of marks secured $= \left(\frac{384}{500} \times 100\right)$ %.

$= 76.8$ %.

iii) Given, A shop has 500 shirts

out of 500 shirts, 15 are defective.

Now, Percentage of shirts are defective $= \left(\frac{15}{500} \times 100\right)$ %.

$= 3$ %.

iv) Given, Vani has 20 gold bangles

also she has 10 silver bangles.

Now, Total number of bangles $= 20 + 10$

$= 30$ bangles.

$\therefore$ Percentage of gold bangles $= \left(\frac{20}{30} \times 100\right)$ %.

$= 66.67$ %.

Percentage of Silver bangles $= \left(\frac{10}{30} \times 100\right)\%$

$= 33.34\%$

v) Total number of voters $= 120$

Out of 120, 90 of them voted

Then out of 120, voters did not vote $= 120 - 90$

$= 30$

$\therefore$ percentage of voters did not vote $= \frac{30}{120} \times 100\%$

$= 25\%$

4. i) Shaded part $= \frac{3}{4}$

Percentage of shaded part $= \left(\frac{3}{4} \times 100\right)\%$

$= 75\%$

ii) Shaded part $= \frac{2}{6} = \frac{1}{3}$

Percentage of shaded part $= \left(\frac{1}{3} \times 100\right)\%$

$= 33.34\%$

iii) Shaded part $= \frac{5}{8}$

Percentage of shaded part $= \left(\frac{5}{8} \times 100\right)\% = 62.5\%$

5.

i) $14\% = \frac{14}{100} = \frac{7}{50}$.

ii) $1\frac{3}{4}\% = \frac{7}{4}\% = \frac{7}{4 \times 100} = \frac{7}{400}$.

iii) $33\frac{1}{3}\% = \frac{100}{3}\% = \frac{100}{3 \times 100} = \frac{1}{3}$.

iv) $37.5\% = \frac{37.5}{100} = \frac{375}{1000} = \frac{3}{8}$.

6

i) $\frac{5}{4} = (\frac{5}{4} \times 100)\% = 125\%$

ii) $\frac{1}{1} = (\frac{1}{1} \times 100)\% = 100\%$

iii) $\frac{2}{3} = (\frac{2}{3} \times 100)\% = 66.67\%$

iv) $\frac{9}{16} = (\frac{9}{16} \times 100)\% = 56.25\%$

7

Given Alloy consists of 7 parts of zinc and 33 parts of Copper

∴ Total Alloy Contains $= 33 + 7 = 40$.

∴ percentage of Copper in alloy $= (\frac{33}{40} \times 100)\%$

$= 82.5\%$

8. Given, Calcium, Carbon and Sand in the ratio 12:3:10.

Sum of ratio = 12+3+10 = 25

Percentage of Carbon in the Chalk = $\left(\frac{3}{25} \times 100\right)\%$

= 12%.

9.

Given Total money = ₹2500

It is divided among Ravi, Raju and Roy

out of total money, Ravi gets two parts

Raju gets three parts

Roy gets five parts.

Total no. of parts = 2+3+5 = 10.

Ravi get money = ₹ $\frac{2}{10} \times 2500$

= ₹ 500.

Raju gets money = ₹ $\frac{3}{10} \times 2500$

= ₹ 750.

Roy gets money = ₹ $\frac{5}{10} \times 2500$

= ₹ 1250.

Percentage of Ravi get money = $\left(\frac{500}{2500} \times 100\right)\%$.

= 20%.

Percentage of Raju gets money $= \left(\frac{750}{2500} \times 100\right)\%$

$= 30\%$

Percentage of Roy get money $= \left(\frac{1250}{2500} \times 100\right)\%$

$= 50\%$

10.

i) $28\% = \frac{28}{100} = 0.28$

ii) $3\% = \frac{3}{100} = 0.03$

iii) $0.44\% = \frac{0.44}{100} = 0.0044$

iv) $37\frac{1}{2}\% = \frac{75}{2}\% = \frac{75}{2 \times 100} = 0.375$

11

i) $0.65 = \frac{65}{100} = \left(\frac{65}{100} \times 100\right)\% = 65\%$

ii) $0.90 = \frac{90}{100} = \left(\frac{90}{100} \times 100\right)\% = 90\%$

iii) $2.1 = \frac{21}{10} = \left(\frac{21}{10} \times 100\right)\% = 210\%$

iv) $0.02 = \frac{2}{100} = \left(\frac{2}{100} \times 100\right)\% = 2\%$

12. i) Given percentage of students in a class are girls = 42%

Actual percentage of students in a class will se 100%.

Percentage of students in a class are boys = (100 − 42) %

= 58 %.

ii) A basket have full of apples, oranges and mangoes

Percentages of apples = 50 %

Percentages of oranges = 30 %.

Percentages of total oranges, apples and mangoes = 100 %.

∴ Now percentages of mangoes = [100 − (50 + 30)] %.

= [100 − 80] %.

= 20 %.

EXERCISE : 7.2

1

i) 15% of 250 $= \frac{15}{100} \times 250 = \frac{3}{20} \times 250 = 37.5$

ii) 25% of 120 litres $= \frac{25}{100} \times 120 = \frac{1}{4} \times 120 = 30$

iii) 1% of 1 hour $= \frac{1}{100} \times 3600$ sec $= 36$ seconds

iv) 75% of 1kg $= \frac{75}{100} \times 1000\,g = \frac{3}{4} \times 1000$ grams $= 750\,g$

v) 120% of ₹250 $= \frac{120}{100} \times ₹250 = ₹300$

vi) 0.6% of 2 km $= \frac{0.6}{100} \times 2000\,m = 12\,m$

2 Given, 8% children of a class like getting wet = 25

Now, Children like getting wet $= \frac{8}{100} \times 25$

$= \frac{2}{25} \times 25$

$= 2$

3.

Given,

Out of 20 in the fridge, Valundara ate = 3 ice creams

Percentage of ice creams, she ate $= \frac{3}{20} \times 100\,\%$

$= 15\%$

4

i) Required percentage $= \left(\frac{20}{50} \times 100\right)\% = \frac{200}{5}\% = 40\%$

ii) Required percentage $= \left(\frac{60}{40} \times 100\right)\% = \frac{300}{2}\% = 150\%$

iii) Required percentage $= \left(\frac{90\text{cm}}{4.5\text{m}} \times 100\right)\% = \left(\frac{90}{4.5 \times 100} \times 100\right)\%$

$= \left(\frac{90}{450} \times 100\right)\%$

$= \frac{100}{5}\%$

$= 20\%$

iv) $5.6\text{ kg} = 5.6 \times 1000\text{ g} = 5600\text{ g}$

Required Percentage $= \left(\frac{350\text{g}}{5600\text{g}} \times 100\right)\% = \frac{350}{56}\%$

$= 6.25\%$

5.

i) 12 of 80 $= \left(\frac{12}{80} \times 100\right)\% = \frac{120}{8}\% = 15\%$

ii) 4 rupees $= 4 \times 100$ paise $= 400$ paise

25 paise of 400 paise $= \left(\frac{25}{400} \times 100\right)\% = \frac{25}{4}\% = 6.25\%$

iii) $2\text{ kg} = 2 \times 1000\text{ g} = 2000\text{ g}$

300g of $2000\text{g} = \left(\frac{300}{2000} \times 100\right)\% = \frac{30}{2}\% = 15\%$

6.

$$\text{Percentage increase} = \left(\frac{\text{increase in value}}{\text{original value}} \times 100\right)\%$$

A school team won 4 games last year, and this year the team won 6 games.

Increase in the games won $= 6 - 4 = 2$

$$\therefore \text{percentage increase} = \left(\frac{2}{4} \times 100\right)\%$$

$$= \frac{100}{2}\%$$

$$= 50\%$$

7

Original price $= £80$

Decrease in price $= £80 - £60$

$= £20$

$$\text{Percentage Decrease} = \left[\frac{\text{Decrease in value}}{\text{original value}} \times 100\right]\%$$

$$= \left[\frac{20}{80} \times 100\right]\%$$

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

$$= 25\%$$

8. In Childhood, petrol price was = ₹1 per litre

Now the price of petrol was = ₹65 per litre

Increase in the value of price = ₹65 − ₹1

= ₹64

∴ Percentage increase = $\left(\frac{64}{1} \times 100\right)\%$

= 6400%

9. Last year, the cost of Basmati rice = ₹40 a kg

Also, percentage increase = 20%.

∴ This price this year will be increased by

= $\frac{20}{100} \times 40$

= 8 a kg

∴ The price of Basmati rice, this year = 40 + 8

= ₹48 a kg.

10. Number of student took exam = 300

percentage failed = 28%.

Number of students failed = $\frac{28}{100} \times 300$

= 84.

∴ Now, the number of students passed = 300 − 84
= 216.

11.

In a constituency, number of voters = 15,000

Percentage of voters, who voted = 60%.

∴ Number of voters who voted : $\frac{60}{100} \times 15000$

= 9000

∴ Number of voters who did not vote = 15,000 − 9000

= 6000.

12.

Length of a flag pole painted green = 20%.

painted Yellow = 45%.

Remaining painted red = 100 − (20 + 45)

= 100 − 65

= 35 %.

Total length of pole = 18 m

Length of pole painted red = $\frac{35}{100} \times 18$ m

= 6.3 m

13. A chalk contains, Calcium = 10%

Carbon = 3%

Oxygen = 12%

and the remaining is sand = $100 - (10+3+12)$

$= 100 - 25$

$= 75\%$

Amount of carbon in $2\frac{1}{2}$ kg chalk = $\frac{3}{100} \times \frac{5}{2} \times 1000\,g$

$= 75\,g$

Amount of calcium in $2\frac{1}{2}$ kg chalk = $\frac{10}{100} \times \frac{5}{2} \times 1000\,g$

$= 250\,g$

Amount of sand = $\frac{75}{100} \times \frac{5}{2}$ kg

$= 1.875$ kg.

14.

i) 25% of x is 9 $\Rightarrow \frac{25}{100} \times x = 9$

$\frac{x}{4} = 9$

$x = 4 \times 9$

$x = 36$

ii) 75% of x is 15 $\Rightarrow \frac{75}{100} \times x = 15$

$$\frac{3x}{4} = 15$$

$$x = \frac{15 \times 4}{3}$$

$$x = 20$$

iii) 12% of it is ₹ 1080

$$\Rightarrow \frac{12}{100} \times x = 1080$$

$$x = \frac{1080 \times 100}{12}$$

$$x = 9000$$

iv) 8% of it is 40 litres $\Rightarrow \frac{8}{100} \times x = 40$

$$x = \frac{40 \times 100}{8}$$

$$x = 500$$

15.

Mohini Saved Salary = ₹ 400.

Percentage Saved = 10% of Total Salary

i.e $\frac{10}{100} \times x = 400$

$$x = \frac{400 \times 100}{10}$$

$$x = 4000$$

∴ Salary = ₹ 4000

16. Number of good apples in basket = 42

Percentage of the apples in a basket go bad = 16%.

Remaining, percentage of apples go good = 100 − 16
= 84%.

Let Total no. of apples be x

i.e 84% of x = 42

$$\frac{84}{100} \times x = 42$$

$$x = \frac{42 \times 100}{84}$$

$$x = 50.$$

∴ Total number of apples = 50.

17. Varun got secured marks = 251 marks.
and got failed by 19 marks

if he gets passed, then he will get = 251 + 19
= 270 marks.

Percentage of marks to get pass = 45%.

Let Maximum marks be "x"

i.e 45% of $x = 270$.

$$\frac{45}{100} \times x = 270$$

$$x = \frac{270 \times 100}{45}$$

$$x = 600.$$

∴ Maximum marks = 600.

18. On a rainy day, percentage of students present in a school = 94%.

Then percentage of students absent = 100 − 94%
= 6%.

Also given, number of students absent on that day = 174

Let Total strength of school be x

i.e 6% of $x = 174$.

$$\frac{6}{100} \times x = 174$$

$$x = \frac{174 \times 100}{6}$$

$$x = 2900.$$

Total strength of school = 2900.

19. Percentage of population in a town are men = 40%

Those are Women = 39%.

Then percentage of population are Childre = 100 − (39+40)

= 100 − 79

= 21%.

Number of children = 12,600.

Let the total population be 'x'

i.e 21% of x = 12,600

$$\frac{21}{100} \times x = 12,600$$

$$x = \frac{12,600 \times 100}{21}$$

$$x = 60,000$$

∴ Now the number of men = 40% of Total

$$= \frac{40}{100} \times 60,000$$

= 24,000.

20.

Price of watch is increased by 15%.

Increase in price is ₹90.

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

$$\text{i.e } 15 = \frac{90}{\text{original value}} \times 100$$

$$\therefore \text{original price} = \frac{90 \times 100}{15}$$

$$\therefore \text{Original price} = 2600.$$

21.

i) Let the original number be x.

Increase in the number = 30% of $x = \frac{30}{100} \times x = \frac{3x}{10}$.

$$\therefore \text{New number} = x + \frac{3x}{10}$$

According to given condition, $x + \frac{3x}{10} = 39$

$$10x + 3x = 39 \times 10 \Rightarrow 13x = 390$$

$$x = \frac{390}{13} = 30$$

Hence, the original number is 30.

ii) Let the original number be y.

Decrease in number = 8% of $y = \frac{8}{100} \times y = \frac{2y}{25}$.

$$\therefore \text{New number} = y - \frac{2y}{25}$$

According to given information, $y - \frac{2y}{25} = 506$.

$25x - 2x = 506 \times 25$

$23x = 506 \times 25$

$x = \frac{506 \times 25}{23}$

$x = 550.$

Hence, the original number is 550.

22.

Percentage reduced = 7%

Let the original number be x.

Decreased in number = 7% of $x = \frac{7}{100} \times x = \frac{7x}{100}$.

$\therefore$ New number $= x - \frac{7x}{100} = \frac{93x}{100}$.

According to given, $\frac{93x}{100} = 465$

$x = \frac{465 \times 100}{93}$

$x = 500$

$\therefore$ Original price = ₹ 500

EXERCISE : 7.3

1. Cost price = ₹ 760, Selling price = ₹ 874

Profit = Selling price − Cost price

= 874 − 760

= ₹ 114.

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

= $\left(\frac{114}{760} \times 100\right)\%$

= 15 %.

2. Cost price = ₹ 2500 ; Selling price = ₹ 2300.

Loss = Cost price − selling price

= ₹ 2500 − ₹ 2300

= ₹ 200

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

= $\left(\frac{200}{2500} \times 100\right)\%$

= 8 %.

3

i) Cost price = ₹ 250 ; selling price = ₹ 325

As S.P > C.P, profit = S.P − C.P

= 325 − 250

= ₹ 75.

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

= $\left(\frac{75}{250} \times 100\right)\%$

= 30 %

ii) Cost price = ₹ 250, Selling price = ₹ 150

As C.P > S.P, Loss = C.P − S.P

= 250 − 150

= ₹ 100.

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

= $\left(\frac{100}{250} \times 100\right)\%$

= 40 %.

4

1st offer:

Cost price = ₹ 4800

Profit = $13\frac{1}{3}\%$ of Cost price = $\frac{40}{3} \times \frac{1}{100} \times 4800$

= 640

Selling price = 4800 + 640 i.e Cost price + profit

= ₹5440

2nd offer:

Cost price = ₹3640

Loss = 15% of Cost price = $\frac{15}{100} \times 3640$

= ₹546.

Selling price = Cost price − loss

= 3640 − 546

= ₹3094

Selling price of 1st and 2nd offer = 5440 + 3094

= ₹8534.

Cost price of 1st and 2nd offer = 4800 + 3640

= ₹8440.

As S.P > C.P, he always get gain

i.e Gain = S.P − C.P

= 8534 − 8440

= ₹94.

5 Cost price of 24 Tables = 24 × 450

= ₹ 10,800

Selling price of 16 of them = 16 × 600

= ₹ 9600

Remaining i.e 24 − 16 = 8 were sold

i.e Now s.p of 8 tables = 8 × 400

= 3200

∴ Total selling price = 9600 + 3200

= 1, 2800

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

Gain = S.P − C.P

= 12,800 − 10,800

= ₹ 2000

6.

Selling price = ₹ 810 ; profit = ₹ 60.

As profit = S.P − C.P

C.P = S.P − profit

= 810 − 60

Cost price = ₹ 750

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

$$= \left(\frac{60}{750} \times 100\right)\%$$

$$= 8\%$$

7. Selling price = ₹ 3906 ; Loss = ₹294

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

$$C.P = \text{Loss} + S.P$$

$$= 294 + 3906$$

$$= ₹ 4,200.$$

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

$$= \left(\frac{294}{4,200} \times 100\right)\%$$

$$= 7\%$$

8. C.P = ₹ 120, Loss percent = 10%.

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

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

$$= \frac{10 \times 120}{100} = ₹ 12$$

Loss = C.P − S.P

S.P = C.P − Loss

= 120 − 12

= ₹ 108

9. Cost price = ₹ 10,000 ; profit = 20 %.

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

$$20 = \frac{\text{Profit}}{10,000} \times 100$$

$$\text{profit} = \frac{20 \times 10,000}{10}$$

profit = 20,000.

As profit = S.P − C.P

S.P = profit + C.P

= 2,000 + 10,000

S.P = ₹12,000

∴ Selling price = ₹ 12,000

10. Selling price = ₹300 ; profit = 20%.

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

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

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

$$20 = \left(\frac{300}{C.P} - 1\right) \times 100$$

$$\frac{300}{C.P} - 1 = \frac{20}{100}$$

$$\frac{300}{C.P} - 1 = \frac{1}{5}$$

$$\frac{300}{C.P} = 1 + \frac{1}{5} = \frac{6}{5}$$

$$\frac{300}{C.P} = \frac{6}{5}$$

$$C.P = \frac{300 \times 5}{6}$$

$$C.P = ₹250$$

∴ Cost price = ₹250.

11. Selling price = ₹320 ; loss percent = 20%.

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

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

$$20 = \left(1 - \frac{320}{C.P}\right) \times 100$$

$$1 - \frac{320}{C.P} = \frac{20}{100}$$

$$1 - \frac{320}{C.P} = \frac{1}{5}$$

$$\frac{320}{C.P} = 1 - \frac{1}{5}$$

$$\frac{320}{C.P} = \frac{5-1}{5}$$

$$\frac{320}{C.P} = \frac{4}{5}$$

$$C.P = \frac{320 \times 5}{4}$$

$$C.P = ₹400$$

∴ Cost price = ₹400.

12. Selling price = ₹522 ; profit = 16%.

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

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

$$= \left(\frac{\text{S.P}}{\text{C.P}} - 1\right) \times 100$$

$$16 = \left(\frac{522}{\text{C.P}} - 1\right) \times 100$$

$$\frac{522}{\text{C.P}} - 1 = \frac{16}{100}$$

$$\frac{522}{\text{C.P}} - 1 = \frac{4}{25}$$

$$\frac{522}{\text{C.P}} = 1 + \frac{4}{25}$$

$$\frac{522}{\text{C.P}} = \frac{29}{25}$$

$$\text{C.P} = \frac{522 \times 25}{29}$$

$$\text{C.P} = ₹750$$

∴ Cost price = ₹750

13. Selling price = ₹ 7360 ; loss % = 8 %.

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

$$= \left(\frac{C.P - S.P}{C.P} \times 100\right)$$

$$= \left(1 - \frac{S.P}{C.P}\right) \times 100$$

$$8 = \left(1 - \frac{7360}{C.P}\right) \times 100$$

$$\frac{8}{100} = 1 - \frac{7360}{C.P}$$

$$\frac{2}{25} = 1 - \frac{7360}{C.P}$$

$$\frac{7360}{C.P} = 1 - \frac{2}{25}$$

$$\frac{7360}{C.P} = \frac{23}{25}$$

$$C.P = \frac{7360 \times 25}{23}$$

$$C.P = ₹\, 8{,}000$$

∴ Cost price = ₹ 8000.

14. Selling price = ₹3168 ; loss = 12%.

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

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

$$12 = \left[1 - \frac{3168}{C.P}\right] \times 100$$

$$1 - \frac{3168}{C.P} = \frac{12}{100}$$

$$1 - \frac{3168}{C.P} = \frac{3}{25}$$

$$\frac{3168}{C.P} = 1 - \frac{3}{25}$$

$$\frac{3168}{C.P} = \frac{22}{25}$$

$$C.P = \frac{3168 \times 25}{22}$$

$$C.P = ₹3600.$$

Given selling price = 3870.

As $S.P > C.P$, he gains

So gain = $S.P - C.P = 3870 - 3600$

$= 270.$

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

$= \left(\frac{270}{3600} \times 100\right)\%$

$= 7.5\%$

15 Selling price = ₹ 4550, Loss = 9%.

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

$9 = \left[1 - \frac{4550}{C.P}\right] \times 100$

$1 - \frac{4550}{C.P} = \frac{9}{100}$

$\frac{4550}{C.P} = 1 - \frac{9}{100}$

$\frac{4550}{C.P} = \frac{91}{100}$

$C.P = \frac{4550 \times 100}{91}$

$C.P = ₹5000$

As given selling price = 4825

As $C.P > S.P$, So he lose

Loss $= C.P - S.P$

$= 5000 - 4825$

Loss $= ₹\ 175$

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

$= \left(\frac{175}{5000} \times 100\right)$

$= 3.5\ \%$

EXERCISE : 7.4.

1. Simple Interest $= \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$

i.e $I = \frac{P \times R \times T}{100}$

i) $P = 350$; $R = 11\%$ $T = 2$ years

$$I = \frac{350 \times 11 \times 2}{100}$$

$$I = ₹ 77$$

Total amount $= S.I + P$

$= 77 + 350$

$= ₹ 427$

ii) $P = 20,000$; $T = 4\frac{1}{2} = \frac{9}{2}$ years ; $R = 8\frac{1}{2} = \frac{17}{2}\%$

$$I = \frac{20,000 \times \frac{17}{2} \times \frac{9}{2}}{100}$$

$$= \frac{20000 \times 17 \times 9}{4 \times 100}$$

$= ₹ 7650$

$\therefore$ Time = ~~2 y~~

Amount = Principal + I

= 20,000 + 7,650

= 27,650.

iii) P = ₹ 648 ; R = $16\frac{2}{3} = \frac{50}{3}$; T = 8 months

$= \frac{8}{12}$ years

$$I = \frac{648 \times \frac{50}{3} \times \frac{8}{12}}{100}$$

$$I = \frac{648 \times 50 \times 8}{36 \times 100}$$

I = ₹ 72.

Amount = S.I + P

= 72 + 648

= ₹ 721.

2

i) S.I = 200, P = 2,500, R = 4 %.

$$I = \frac{P \times R \times T}{100}$$

$$\text{Time, } T = \frac{100 \times I}{P \times R}.$$

$$T = \frac{100 \times 200}{2,500 \times 4}$$

$$T = 2 \text{ years}$$

ii) $S.I = 2730$, $P = 12,000$, $R = 6\frac{1}{2} = \frac{13}{2}$.

$$T = \frac{100 \times I}{P \times R}$$

$$= \frac{100 \times 2730}{12,000 \times 13/2}$$

$$= \frac{100 \times 2730 \times 2}{12,000 \times 13}$$

$$T = \frac{7}{2} \text{ years} = 3\frac{1}{2} \text{ years}$$

3.

i) $P = 1560$, $I = 585$, $T = 3$ years

$$I = \frac{P \times R \times T}{100}$$

$$\text{Rate of Interest, } R = \frac{100 \times I}{P \times T}$$

$$R = \frac{100 \times 585}{1560 \times 3} = (1.25 \times 100)\%$$

$$R = \frac{25}{2}\% = 12\frac{1}{2}\%$$

ii) $I = 325$, $P = 1625$, $T = 2\frac{1}{2} = \frac{5}{2}$ years

$$R = \frac{100 \times I}{P \times T}$$

$$= \frac{100 \times 325}{1625 \times 5/2}$$

$$= \frac{100 \times 325 \times 2}{1625 \times 5}$$

$$= 8\%$$

4.

i) $R = 16\%$; $T = 2\frac{1}{2}$ years $= \frac{5}{2}$ years , $I = 3840$.

$$I = \frac{PRT}{100}$$

$$P = \frac{100 \times I}{R \times T}$$

$$P = \frac{100 \times 3840}{16 \times 5/2}$$

$$P = \frac{100 \times 3840 \times 2}{16 \times 5}$$

$$P = ₹9600.$$

$\therefore$ principal = ₹9,600

ii) $R = 7\frac{1}{2} = \frac{15}{2}\%$; T = 2 years 4 months $I = 2730$.

$= (2 + \frac{4}{12})$ years

$= (2 + \frac{1}{3})$ years

$= \frac{7}{3}$ years

$$P = \frac{100 \times I}{R \times T}$$

$$= \frac{100 \times 2730}{\frac{15}{2} \times \frac{7}{3}}$$

$$= \frac{100 \times 2730 \times 6}{15 \times 7}$$

Principal, P = ₹ 15,600.

5. i) Amount = ₹ 1320 ; principal = ₹ 1200.

S.I. $= A - P = 1320 - 1200$

S.I. $= 120$.

$$I = \frac{P \times R \times T}{100}$$

$$R = \frac{100 \times I}{P \times T}$$

$$R = \frac{100 \times 120}{1200 \times 2}$$

$$R = 5\% \text{ per annum}$$

ii) Amount = ₹ 400 ; principal = ₹ 300

$$S.I = A - P = 400 - 300$$

$$I = ₹ 100$$

$$R = \frac{100 \times 100}{300 \times 2}$$

$$R = \frac{50}{3} = 16\frac{2}{3}\% \text{ per annum.}$$

6.

i) $A = 1950$, $P = 1250$, $R = 16\%$

$$I = A - P = 1950 - 1250 = 700$$

$$I = \frac{P \times R \times T}{100}$$

$$T = \frac{100 \times I}{P \times R}$$

$$T = \frac{100 \times 700}{1250 \times 16}$$

$$\text{Time, } T = \frac{7}{2} \text{ years}$$

ii) $A = 8447.50$, $P = 6540$; $R = 12\frac{1}{2} = \frac{25}{2}$.

$$I = A - P = 8447.5 - 6540$$

$$I = 1907.5$$

$$\text{Time, } T = \frac{100 \times 1907.5}{6540 \times 25/2}$$

$$T = \frac{100 \times 19075 \times 2}{6540 \times 25}$$

$$\text{Time, } T = \frac{7}{3} \text{ years}$$

$$T = 2 \text{ years } 4 \text{ months}$$

7 $R = 4\%$ $A = 16,240$, $P = 14,000$.

$$I = A - P = 16,240 - 14,000$$

$$I = 2,240$$

$$\text{Time} = \frac{100 \times I}{P \times R}$$

$$\text{Time} = \frac{100 \times 2,240}{14,000 \times 4}$$

$$= 4 \text{ years}$$

8. $T = 6$ years, Given Amount invested trebled

So $A = 3 \times$ principal

$A = 3P$

$I = A - P = 3P - P$

$I = 2P$

$I = \frac{P \times R \times T}{100}$

$R = \frac{100 \times I}{P \times T}$

$R = \frac{100 \times 2P}{P \times 6}$

$R = \frac{100}{3} = 33\frac{1}{3}\%$ per annum

9 i) $A = 4,500$; $R = 20\%$ $T = 5$ years

$I = A - P$

$I = 4,500 - P$

Also, $I = \frac{P \times R \times T}{100}$

$4,500 - P = \frac{P \times 20 \times 5}{100}$

$4,500 - P = P$

$P + P = 4,500$

$2P = 4,500$

Principal, $P = 2250$

ii) $A = 2420$, $R = 4$, $T = 2\frac{1}{2}$ years $= \frac{5}{2}$ years

$I = A - P$

$I = 2420 - P$

Also, $I = \frac{P \times R \times T}{100}$

$2420 - P = \frac{P \times 4 \times 5}{2 \times 100}$

$2420 - P = \frac{P}{10}$

$P + \frac{P}{10} = 2420$

$\frac{11P}{10} = 2420$

$P = \frac{2420 \times 10}{11}$

$P = 2,200$

∴ principal, $P = 2,200$.