chapter12 percentage

Exercise 12.1

Q 1

Write each of the following as percent:

(i) $\frac{7}{25}$

To convert a fraction into percent we multiply the fraction by 100 and put the percent sign %.

Thus, $\left(\frac{7}{25} \times 100\right)\% = 28\%$

(ii) $\frac{14}{625}$

$\left[\frac{14}{625} \times 100\right]\% = 2.24\%$

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

$\left[\frac{5}{8} \times 100\right]\% = 62.5\%$

(iv) 0.8

$(0.8 \times 100)\% = 80\%$

(v) 0.005

$(0.005 \times 100)\% = 0.5\%$

(vi) 3:25

$3:25 = \left[\frac{3}{25} \times 100\right]\% = 12\%$

(vii) 11:80.

$11:80 = \left[\frac{11}{80} \times 100\right]\% = 13.75\%$

(viii) 111:125.

$111:125 = \frac{111}{125} \times 100 = 88.8\%$

In order to convert a given ratio to percent, we first convert the ratio in the fraction form then we multiply it with 100

Q 2

2. convert the following percentages to fractions and ratios:

(i) 25 %.

To convert a percent into a fraction, we devide it by 100 and remove the percentage sign %.

$25\% = \frac{25}{100} = \frac{1}{4}$.

To convert a given percent into a ratio, we first convert the Percent into a fraction and express it as a ratio.

$25\% = \frac{25}{100} = \frac{1}{4} = 1:4$.

(ii) 2.5 %.

Percent → fraction

$2.5\% = \frac{2.5}{100} = \frac{1}{40}$.

Percent → ratios.

$2.5\% = \frac{2.5}{100} = \frac{1}{40} = 1:40.$

(iii) 0.25%

Percent ⟶ fraction.

$0.25\% = \frac{0.25}{100} = \frac{1}{400}$

Percent → ratios

$0.25\% = \frac{0.25}{100} = \frac{1}{400} = 1:400.$

(iv) 0.3%

percent⟶ fraction

$0.3\% = \frac{0.3}{100} = \frac{3}{1000}$

Percent → ratios

$0.3\% = \frac{0.3}{100} = \frac{3}{1000} = 3:1000.$

(v) 125%

Percent → fraction

$125\% = \frac{125}{100} = \frac{5}{4}.$

Percent → ratios

$125\% = \frac{125}{100} = \frac{5}{4} = 5:4.$

Q 3

Express the following as decimal fractions.

(i) 27%

To convert a given percent in decimal form, we express it as a fraction with denominator as 100 and then the fraction is written in decimal form.

$27\% = \frac{27}{100} = 0.27.$

(ii) 6.3%

$6.3\% = \frac{6.3}{100} = 0.063.$

(iii) 32%

$32\% = \frac{32}{100} = 0.32.$

(iv) 7.5%

$7.5\% = \frac{7.5}{100} = 0.075$

(v) $\frac{1}{8}\%$

$\frac{1}{8}\% = \frac{1}{8 \times 100} = \frac{1}{800} = 0.00125.$

Exercise 12.2

Q 1

Find:

(i) 22% of 120.

22% of RS 120 = RS $\frac{22}{100} \times 120$

= RS 26.40.

Procedure:-

To find a percent of a given number, we proceed as follows.

1. obtain the number, say x.
2. obtain the required percent, say P%.
3. Multiply x by P and divide by 100 to obtain the required P% of x.

i.e., $P\% \text{ of } x = \frac{P}{100}$

(ii) 25% of RS 1000.

25% of RS 1000 = RS $\frac{25}{100} \times$ RS 1000

= RS 250

(iii) 25% of 10 kg.

25% of 10 kg = kg $\frac{25}{100} \times 10$

= 2.5 kg.

(iv) 16.5% of 5000 metre

16.5% of 5000 metre = $\frac{16.5}{100} \times 5000$ = 825 metres

Q 2

Find the number a, if

(i) 8.4% of a is 42.

8.4% of a = 42

$\Rightarrow \frac{8.4}{100} a = 42$

$\Rightarrow a = 500$.

(ii) 0.5% of a is 3.

Thus, $\frac{0.5a}{100} = 3$

$a = \frac{300}{0.5} = 600$.

(iii) $\frac{1}{2}$% of a is 50.

Thus, $\frac{a}{2 \times 100} = 50$

$a = 200 \times 50 = 10000$.

(iv) 100% of a 100.

Thus, 100% of a is 100

$\frac{100a}{100} = 100 \Rightarrow a = 100$.

Q 3

A coolie deposits Rs 150 per month in his post office Savings Bank account, If this is 15% of monthly income, find his monthly income.

Thus, we have.

15% of income = 150.

$\frac{15}{100} \times \text{income} = 150$

$\text{income} = \frac{150 \times 100}{15}$

$\text{income} = 1000.$

Hence, income = Rs. 1000

Q 4

A coolie deposits Rs 150 per month in his post office Savings Bank account, If this is 15% of monthly income, find his monthly income.

Thus, we have.

15% of income = 150.

$\frac{15}{100} \times \text{income} = 150$

$\text{income} = \frac{150 \times 100}{15}$

$\text{income} = 1000.$

Hence, income = Rs. 1000

Q 5

Asha got 86.875% marks in the annual examination. If she got 695 marks find the total number of marks of the examination.

Let 'x' be the total number of marks of the examination.

Thus, we have

$86.875\% \text{ of } x = 695$

$\frac{86.875}{100} x = 695$

$x = \frac{695 \times 100}{86.875}$

$x = 800 \text{ Marks.}$

Total number of marks = 800 Marks.

Q 6

Deepthi went to School for 216 days in a full year. If her attendance is 90% find the number of days on which the School was opened.

Let x be the number of days on which the School was opened.

Thus, we have

$$90\% \text{ of } x = 216$$

$$\frac{90x}{100} = 216$$

$$x = \frac{216 \times 100}{90}$$

$$x = 240 \text{ days.}$$

number of days = 240 days.

Q 7

A garden has 2000 trees. 12% of these are mango trees. 18% Lemon and the rest are orange trees. Find the number of orange trees.

Given that,

Total number of trees = 2,000.

Total = 100%.

12% mango + 18% Lemon + orange % = 100%.

orange % = 100% − 12% mango − 18% Lemon

= 70%.

∴ orange = 70%.

70% oranges = 70% of 2000 trees

$$= \frac{70}{100} \times 2000$$

$$= 1400.$$

∴ Total orange trees = 1400.

Q 8

Balanced Diet should contain 12% of proteins, 25% of fats and 63% of carbohydrates. If a child needs 2600 calories in the food daily, find the calories the amount of each of these in his daily Food intake.

Sol^n:-

12% of proteins = 12% of 2600 calories

$$= \frac{12}{100} \times 2600 = 312.$$

25% of fats $= \frac{25}{100} \times 2600 = 650$ calories.

63% of carbohydrates $= \frac{63}{100} \times 2600 = 1638$ calories

Q 9

A cricketer scored a total of 62 runs in 96 balls. He hit 3 sixes, 8 fours, 2 twos and 8 singles. What percentage of total runs came in

(i) Sixes.

Thus, we have

Let percent be 'x'

3 sixes = 3 × 6 Runs = 18 Runs. [∵ 1 six = 6 Runs]

18 Runs of x = 62 Runs.

$$x = \frac{62}{18} \times 100$$

$$x = 29.03\%.$$

(ii) fours.

Let percent be 'x'

8 fours = 8 × 4 Runs = 32 Runs. [∵ 1 four = 4 Runs]

32 Runs of x = 62 Runs

$$x = \frac{62}{32} \times 100$$

$$x = 51.61\%.$$

(ii) two's

2 two's = 2 × 2 = 4 Runs.

4 Runs of x = 62 Runs

$$x = \frac{62}{4} \times 100$$

Q 10

A cricketer hit 120 Runs in 150 balls during a test match. 20% of runs came in 6's, 30% in 4's, 25% on 2's and the rest in 1's. How many runs did he score in.

(i) 6's (ii) 4's (iii) 2's (iv) Singles.

Soln:- (i) Total Runs = 120.

G/T 20% of Runs came in 6's.

Let runs be x. $\Rightarrow \frac{20}{100} \times 120 = x.$

$$\frac{20}{100} \times x = 120\ x$$

$$x = 24 \text{ Runs.}$$

(ii) G/T 30% in 4's.

$$\frac{30}{100} \times 120 = x.$$

$$x = 36 \text{ Runs.}$$

Hence, required Runs = 36 Runs.

(iii) G/T 25% in 2's

$$\frac{25}{100} \times 120 = x$$

$$x = 30 \text{ Runs.}$$

Hence, required runs = 30 Runs.

(iv) G/T 1's percent = 100 − 20 − 30 − 25 = 25%.

Total Runs = 120.

$$\frac{25}{100} \times 120 = x. \Rightarrow x = 30 \text{ Runs.}$$

he scored 30 Runs using Singles.

Q 11

Radha earns 22% of her investment if she earns is RS 187, then How much did she invest?.

Let the investment be 'x'

22 % of x = 187.

[∵ earn = RS 187]

$\frac{22}{100} x = 187$

$x = \frac{18700}{22}$.

x = RS.850

Q 12

Rohit deposits 12% of his income in a bank. He deposited RS 1440 in the bank during 1997. What was his total income for the year 1997.

Let the income be 'x'

12% of x = 1440

$\frac{12}{100} x = 1440$

$x = \frac{1440 \times 100}{12}$

$x = 120 \times 100$

x = RS.12,000.

∴ his total income in the yeal 1997 = Rs.12,000

Q 13

Gun powder contains 75% Nitre and 10% sulphur. Find the amount of gunpowder which carries 9kg nitre. What was the amount of gun powder would contain 2.3kg sulphur.

Given that,

75% Nitre = 9kg.

The amount of gun powder = ?

Let amount of gun powder be 'x'

Thus, 75% of x = 9kg

$\frac{75}{100} \times x = 9kg$

$x = \frac{9 \times 4}{3}$ kg

x = 12kg.

Given that sulphur amount = 2.3kg. Then,

Let the amount of gun powder be 'y'

Thus, 10% of y = 2.3kg

$y = \frac{2.3 \times 100}{10}$ kg

y = 23kg.

Hence, gun powder amount = 23kg.

Q 14

An alloy of tin and copper consists of 15 parts of tin and 105 parts of copper. Find the percentage of copper in the alloy.

G|T

tin = 15 parts ; Copper = 105 parts.

Total = 15 parts + 105 parts = 120 parts.

$$\text{Percentage of copper} = \frac{\text{copper parts}}{\text{Total}} \times 100$$

$$= \frac{105}{120} \times 100$$

$$= 87.5\%.$$

Q 15

An alloy contains 32% copper, 40% nickel and rest zinc. Find the mass of the zinc in 1kg of alloy.

G|T Mass of alloy = 1kg.

copper % = 32 %.

nickel % = 40%.

zinc % = 100% - copper % - nickel %.

= 100 - 72 %.

= 28%.

28% of 1kg = mass of zinc

Mass of zinc = $\frac{28}{100} \times 1000$gms [kg = 1000g]

= 280gm.

Q 16

A Motorist Travelled 122 Kilometers before his first stop If he had 10% of his journey to complete at this Point, how long wast the total rode.

Sol^n:- Motorist travelled distance = 122 km.

Total ride = ?

G|T 10% of Total ride = 122 km.

$$\frac{10 \times \text{Total ride}}{100} = 122 \text{ km}$$

$$\text{Total ride} = \frac{122 \times 100}{10} \text{ km}$$

$\therefore$ Total ride = 1220 km

Hence, Total ride = 1220 km.

Q 17

A certain school has 300 students, 142 of whom are boys. It has 30 teachers. 12 of whom are men. what percentage of total no of Students and teacher in the school is female.

Total students = 300

Total Teachers = 30.

Boys = 142; Men teachers=(12)

Total no of female(students and teachers)

= Total - male

= 330 - 42 - 12 = 176.

$$\text{Female Percent} = \frac{\text{Total female}}{\text{Total}} \times 100 = \frac{176 \times 100}{330}$$

$$= \frac{160}{3}\%.$$

Q 18

Aman's income is 20% less than that of Anil. How much percent Anil's income more than Aman's income.

Let Aman's income be 'x'.

Anil's income be 'y'

Given that

$x = y - 20\% \cdot y.$

$x = y - \frac{20}{100} y.$

$100x = 80y.$

$x = \frac{4}{5} y.$

$\frac{5}{4} x = y.$

$1.25 x = y.$

$x + 0.25x = y.$

$x + \frac{25}{100} x = y.$

$x + 25\% \cdot x = y.$

Aman's income + 25% Aman's income = Anil's income

∴ 25% Anil's income more than Aman's income.

Q 19

The value of a machine depreciates every year by 5% if the present value of the machine be RS 100000, what will be value after 2 years.

Present Value of the machine = RS 1,00,000.

After 1st year Value of the machine

= RS 1,00,000 - 5% of 1,00,000

= RS 1,00,000 - 5,000.

= 95,000.

After 1 year value of the machine = 95,000.

After 2 years Value of the machine = 95,000 - 5% (9500)

= 95,000 - 4,750

= 90,250.

Q 20

The population of a town increases by 10% annually. If the present population is 60000. what will be its value of town after two years.

Present population of a town = 60,000.

After 1 year population = 60,000 + 10% Present Population

$= 60{,}000 + \frac{10}{100} \times 60000$

$= 66{,}000.$

After 2 years population = 66,000 + 10% (After 1 year Population)

$= 66{,}000 + \frac{10}{10} \times 66000$

Population after 2yrs = 72,600.

Q 21

The population of a town increases by 10% annually. If the present population is 22000, find its population a year ago.

Let the population of the town be 100 a year ago. Then,

Increase in population = 10% of 100 = 10.

∴ Present population = 110

If present population is 110, population a year ago = 100.

If present population is 1, population a year ago = $\frac{100}{110}$.

If present population is 22,000, population

a year ago = $\frac{100}{110} \times 22{,}000$

$= 20{,}000.$

Hence, the population of the town a year ago = 20000.

Q22

Ankit was given an increment of 10% on his salary. His new salary is RS 3575. what was the salary before increment.

Let the salary be 100 a year ago, then,

Increment = 10%

Present salary = 110. Previous salary a year ago = 100.

If present salary is 1, population a year ago = $\frac{100}{110}$

If present salary is 3575, population a year

ago = $\frac{100}{110} \times 3575$

Hence, population a year ago = RS 3,250.

Q 23

In the new budget, the price of petrol Rose by 10%. By how much percent must one reduce the consumption so that the expandicture does not increase.

Let the consumption of petrol originally 100 Lit and its price be RS100 Then,

New price of 100 Lit of petrol = RS 110

[increase by 10%.]

Now, RS 110 can fetch 100 Lit of petrol.

$\therefore$ RS 100 can fetch $= \left(\frac{100}{110} \times 100\right)$ Lit of petrol

$= \frac{1000}{11}$ Lit of petrol.

$\therefore$ Reduction in consumption $= \left(100 - \frac{1000}{11}\right)\%$

$= \frac{100}{11}\%$.

Q 24

$= \frac{100}{11}\%$.

Mohan's income in RS 15500 per month. He saves 11% of his income If his increase by 10%. Then he reduces his saving by 1%. how much does he save now?

Mohan's income = Rs 15,500

Mohan's income After increase by 10% =

$15500 + \frac{15500 \times 10}{100}$

$= 17050.$

Mohan's savings % $= (11 - 1)\% = 10\%$

Mohan's savings = 10% of 17050

$= \frac{17050 \times 10}{100} = RS\ 1705.$

$\therefore$ he saves money same as before.

Q 25

Shikha's income is 60% more than that of Shalu what percent is Shalu's income less than Shikha's?

Let Shikha's income be 'x'

Shalu's income be 'y'

ATQ $x = y + \frac{60}{100} y$

$100x = 160y.$

$\frac{100}{160} x = y.$

$\frac{5}{8} x = y.$

$x - \frac{3x}{8} = y.$

$x - \frac{60}{160} x = y.$

$\therefore$ Shika's salary - 37.5% of shikha's salary = Shalu's salary.

Shalu's income 37.5% Less than shikha's.

Q 26

Rs 3500 is to be shared among three people so that first person gets 50% of the second, who in turn gets 50% of the third. How much will each of them get?

Total amount = Rs 3,500.

Let first person salary = x

second person Salary = $y = 50\% \cdot x = \frac{50}{100} x$

Third person Salary = $z = 50\% \cdot y$.

$100y = 50x$

$\Rightarrow z = \frac{50}{100} y$

$\Rightarrow 100z = 50y$

$\Rightarrow y = 2z$.

$\Rightarrow x = 2y = 2(2z) = 4z$.

$\therefore 4z + 2z + z = 3,500$.

$7z = Rs\ 3,500$

$z = 500$.

$y = 2z = 1000$.

$x = 4z = 2,000$.

First Person Salary → 2,000.

second Person Salary → 1,000

Third Person Salary → 500.