

# Percent and Percentage

## POINTS TO REMEMBER

1. The cent means hundred. Therefore percent means after hundred and notation % is used for it.
2. **To express an ordinary given statement as percent.**
  - (i) Express the given statement as a fraction.
  - (ii) Convert this fraction into an equivalent fraction with denominator 100. Therefore to express a fraction or a decimal as percent, multiply it by 100.
3. **To Express-One quantity as a percent of the other.**
  - (i) If necessary, convert with the quantities into the same units.
  - (ii) From the fraction with the number to be compared as numerator and the number with which it is to be compared as denominator.
  - (iii) Multiply the fraction obtained by 100 and at the same time write the percent sign (%).

## EXERCISE 8 (A)

### Question 1.

Express each of the following as percent :

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

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

(iii) 0.025

(iv) 0.125

(v)  $\frac{3}{8}$

(vi) 0.25

### Solution :

$$(i) \frac{3}{4} = \frac{3}{4} \times 100 = 75\%$$

$$(ii) \frac{2}{3} = \frac{2}{3} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%$$

$$(iii) 0.025 = \frac{25}{1000} \times 100 = \frac{25}{10}\% = 2.5\%$$

$$(iv) 0.125 = \frac{125}{1000} \times 100 = \frac{125}{10} = 12.5\%$$

$$(v) \frac{3}{8} = \frac{3}{8} \times 100 = \frac{75}{2} = 37\frac{1}{2}\%$$

$$(vi) 0.25 = \frac{25}{100} \times 100 = 25\%$$



**Question 3.**

What percent is :

(i) 16 hours of 2 days ?

(ii) 40 paise of Rs. 2 ?

(iii) 25 cm of 4 metres

(iv) 600 gm of 5 kg ?

**Solution :**

**Sol. (i)** 16 hours of 2 days

$$\begin{aligned} &= \frac{16}{2 \times 24} = \frac{16}{48} \times 100\% \\ &= \frac{100}{3}\% = 33\frac{1}{3}\% \end{aligned}$$

**(ii)** 40 paise of Rs. 2

$$\begin{aligned} &= \frac{40}{2 \times 100} = \frac{40}{200} \times 100\% \\ &= 20\% \text{ Ans.} \end{aligned}$$

**(iii)** 25 cm of 4 metres

$$\begin{aligned} &= \frac{25}{4 \times 100} = \frac{1}{16} \times 100\% \\ &= \frac{25}{4}\% = 6\frac{1}{4}\% \end{aligned}$$

$$\begin{aligned} \text{(iv) 600 gm of 5 kg} &= \frac{600}{5 \times 1000} \times 100\% \\ &= 12\% \end{aligned}$$

**Question 4.**

Find the value of:

(i) 5% of Rs. 350      (ii) 10% of Rs. 400.40

(iii) 1% of Rs. 500      (iv)  $12\frac{1}{2}\%$  of 80 kg

(v)  $\frac{5}{8}\%$  of Rs. 600      (vi)  $33\frac{1}{3}\%$  of 27 m

**Solution :**

(i) 5% of Rs. 350

$$= \text{Rs. } 350 \times \frac{5}{100} = \text{Rs. } \frac{35}{2}$$

$$= \text{Rs. } 17.50$$

$$(ii) 10\% \text{ of Rs. } 400.40 = \text{Rs. } 400.40 \times \frac{10}{100}$$
$$= \text{Rs. } 40.04$$

$$(iii) 1\% \text{ of Rs. } 500 = \text{Rs. } 500 \times \frac{1}{100}$$
$$= \text{Rs. } 5$$

$$(iv) 12\frac{1}{2}\% \text{ of } 80 \text{ kg} = 80 \text{ kg} \times \frac{25}{2 \times 100}$$
$$= 10 \text{ kg}$$

$$(v) \frac{5}{8}\% \text{ of Rs. } 600 = \text{Rs. } 600 \times \frac{5}{8 \times 100}$$
$$= \text{Rs. } \frac{15}{4} = \text{Rs. } 3.75$$

$$(vi) 33\frac{1}{3}\% \text{ of } 27 \text{ m}$$

$$= 27 \text{ m} \times \frac{100}{3 \times 100}$$
$$= 9 \text{ m}$$

**Question 5.**

In a class of 60 children, 30% are girls. How many boys are there ?

**Solution :**

Total children = 60,

Girls = 30%

$$\therefore \text{Total girls} = 30\% \text{ of } 60 = 60 \times \frac{30}{100} = 18$$

$$\therefore \text{No. of boys} = 60 - 18 = 42$$

**Question 6.**

In an election, two candidates A and B contested. A got 60% of the votes. The total votes polled were 8000. How many votes did each get ?

**Solution :**

Total number of votes polled = 8000

A got 60% of the votes

$$\text{A got total votes} = 60\% \text{ of } 8000 = 8000 \times \frac{60}{100} = 4800$$

$$\therefore \text{B got total votes} = 8000 - 4800 = 3200$$

**Question 7.**

A person saves 12% of his salary every month. If his salary is ₹2,500, find his expenditure.

**Solution :**

Total salary = ₹2500

Saving = 12% of the salary

$$\therefore \text{Total savings} = 12\% \text{ of } ₹2500$$

$$= ₹2500 \times \frac{12}{100} = ₹300$$

$$\therefore \text{Total expenditure} = ₹2500 - ₹300 = ₹2200$$

**Question 8.**

Seeta got 75% marks out of a total of 800. How many marks did she lose ?

**Solution :**

Total marks = 800

Marks Seeta got = 75% of total marks

$$\therefore \text{Total marks Seeta got} = 75\% \text{ of } 800$$

$$= 800 \times \frac{75}{100} = 600$$

$$\therefore \text{Marks Seeta lose} = 800 - 600 = 200$$

**Question 9.**

A shop worth ₹25,000 was insured for 95% of its value. How much would the owner get in case of any mishappening ?

**Solution :**

Value of shop = ₹25,000

Insured amount = 95% of total value

= 95% of ₹25,000

$$= ₹25,000 \times \frac{95}{100}$$

$$= ₹ 23,750$$

**Question 10.**

A class has 30 boys and 25 girls. What is the percentage of boys in the class ?

**Solution :**

No. of boys = 30

No. of girls = 25

Total number of children = 30 + 25 = 55

∴ Percentage of boys in the class

$$= \frac{30}{55} \times 100$$

$$= \frac{600}{11} = 54\frac{6}{11} \%$$

**Question 11.**

Express :

(i)  $3\frac{2}{5}$  as a percent

(ii) 0.0075 as percent

(iii) 3 : 20 as percent

(iv) 60 cm as percent of 1 m 25 cm

(v) 9 hours as a percent of 4 days.

**Solution :**

(i)  $3\frac{2}{5}$  as a percent

$$3\frac{2}{5} = \frac{3 \times 5 + 2}{5} = \frac{17}{5}$$

Now, convert  $\frac{17}{5}$  as a percent

$$= \frac{17}{5} \times 100 = 340\%$$

(ii) 0.0075 as percent

$$.0075 \times 100 = 0.75\%$$

$$\text{or } \frac{0.0075}{10000} \times 100 = 0.75\%$$

(iii) 3 : 20 as percent

$$= \frac{3}{20} \times 100 = 15\%$$

(iv) 60 cm as percent of 1 m 25 cm

60 cm as percent of  $(1 \times 100 + 25)$  cm

$\therefore$  1 metre = 100 cm

$$= \frac{60}{125} \times 100 = 12 \times 4 = 48\%$$

(v) 9 hours as a percent of 4 days

= 1 days = 24 hours

$\therefore$  4 days =  $4 \times 24 = 96$  hours

$$= \frac{9}{96} \times 100 = \frac{75}{8}\%$$

$$\text{or } 9\frac{3}{8}\%$$

**Question 12.**

(i) Find 2% of 2 hours 30 min.

(ii) What percent of 12 kg is 725 gm?

**Solution :**

(i) 2% of 2 hours 30 min

∴ 1 hour = 60 minutes

∴ 2 hours 30 min. =  $2 \times 60$  min. + 30 min.

$$= 120 + 30 = 150 \text{ min}$$

$$= 150 \times \frac{2}{100} = \frac{30}{10}$$

$$= 3 \text{ minutes}$$

(ii) 12 kg is 725 gm

1 kg = 1000 gm

∴ 12 kg =  $12 \times 1000 = 12000$  gm

$$\frac{725}{12000} \times 100 = \frac{725}{120}$$

$$= \frac{145}{24} \% \text{ or } 6\frac{10}{24} \%$$

## EXERCISE 8 (B)

### Question 1.

Deepak bought a basket of mangoes containing 250 mangoes 12% of these were found to be rotten. Of the remaining, 10% got crushed. How many mangoes were in good condition ?

### Solution :

Total mangoes = 250

Rotten mangoes = 12% of 250

$$= 250 \times \frac{12}{100} = 30$$

Remaining mangoes =  $250 - 30 = 220$

Mangoes which were crushed = 10% of 220

$$= 220 \times \frac{10}{100} = 22$$

∴ Balance =  $220 - 22 = 198$

Hence 198 mangoes were in good condition.

### Question 2.

In a Maths Quiz of 60 questions, Chandra got 90% correct answers and Ram got 80% correct answers. How many correct answers did each give ?

What percent is Ram's correct answers to Chandra's correct answers ?

### Solution :

No. of total questions = 60

Chandra got correct answers of the questions

= 90% of 60

$$= \frac{60 \times 90}{100} = 54$$

Ram got correct answers of the questions

= 80% of 60

$$= 60 \times \frac{80}{100} = 48$$

∴ Percentage of Ram's correct answer of

$$\begin{aligned} \text{that of Chandra's} &= \frac{48}{54} \times 100 = \frac{800}{9} \% \\ &= 88\frac{8}{9} \% \end{aligned}$$

**Question 3.**

In an examination, the maximum marks are 900. A student gets 33% of the maximum marks and fails by 45 marks. What is the passing mark ? Also, find the pass percentage.

**Solution :**

Maximum marks = 900

A student got 33% of 900 marks

$$= 900 \times \frac{33}{100} = 297$$

No. of marks by which he failed = 45

$$\therefore \text{Pass marks} = 297 + 45 = 342$$

$$\text{Percentage of pass marks} = \frac{342 \times 100}{900}$$

$$= 38\%$$

**Question 4.**

In a train, 15% people travel in first class, 35% travel in second class. The balance travel in the A.C. class ? Calculate the percentage of A.C. class travellers ?

**Solution :**

Let no. of people = 100

No. of people in first class = 15

and no. of people travel in second class

$$= 35$$

$$\therefore \text{Balance} = 100 - (15 + 35) = 100 - 50 = 50$$

$\therefore$  Percent of people travel in AC class

$$= 50\%$$

**Question 5.**

A boy eats 25% of the cake and gives away 35% of it to his friends. What percent of the cake is still left with him ?

**Solution :**

Let total cake = 100

Cake which was eaten by the boy = 25

Cake which was given to his friends = 35

$$\begin{aligned}\therefore \text{Balance cake} &= 100 - (25 + 35) \\ &= 100 - 60 = 40\end{aligned}$$

Hence he has 40% of the cake with him.

**Question 6.**

What is the percentage of vowels in the English alphabet ?

**Solution :**

There are 5 vowels in 26 English alphabets

$$\begin{aligned}\therefore \text{Percentage of vowels} &= \frac{5 \times 100}{26} \\ &= \frac{250}{13} = 19\frac{3}{13}\%\end{aligned}$$

**Question 7.**

(i)  $6\frac{1}{4}\%$  of what number is 375 ?

(ii) 0.2% of a number is 5. Find the number.

(iii) 30 is  $16\frac{2}{3}\%$  of a number. Find the number.

**Solution :**

(i) Let number be  $x$ .

$$\text{Then } 6\frac{1}{4}\% \text{ of } x = 375$$

$$\Rightarrow \frac{25}{4 \times 100} \text{ of } x = 375$$

$$\Rightarrow \frac{1}{16} x = 375$$

$$\therefore x = \frac{375 \times 16}{1} = 6000$$

Hence number = 6000

(ii) Let number =  $x$

$$\text{then } 0.2\% \text{ of } x = 5$$

$$\Rightarrow \frac{2}{10 \times 100} \text{ of } x = 5 \Rightarrow \frac{1}{500} \text{ of } x = 5$$

$$\Rightarrow x = \frac{5 \times 500}{1}$$

$$\Rightarrow x = 2500$$

$$\therefore \text{Number} = 2500$$

(iii) Let the number =  $x$

$$\text{then } 16\frac{2}{3}\% \text{ of } x = 30$$

$$\Rightarrow \frac{50}{3 \times 100} \text{ of } x = 30 \Rightarrow \frac{1}{6} \text{ of } x = 30$$

$$\Rightarrow x = 30 \times 6 = 180$$

Hence number = 180

**Question 8.**

The money spent on the repairs of a house was 1% of its value. If the repair, costs Rs. 5,000, find the cost of the house.

**Solution :**

Let cost of house =  $x$

Then cost of repairs = 1% of  $x$

$\therefore$  1% of  $x = 5000$

$$\Rightarrow \frac{1}{100} \times x = 5000 \Rightarrow x = 5,000 \times \frac{100}{1}$$

$$x = 5,00,000$$

Hence cost of house = Rs. 5,00,000

**Question 9.**

In a school out of 300 students, 70% are girls and 30% are boys. If 30 girls leave and no new boy is admitted, what is the new percentage of girls in the school ?

**Solution :**

Total number of children in a school = 300

No. of boys = 30% of 300

$$= \frac{30}{100} \times 300 = 90$$

and no. of girls = 70% of 300

$$= \frac{70}{100} \times 300 = 210$$

Now no. of girls left = 30

$\therefore$  No. of girls after leaving 30 girls

$$= 210 - 30 = 180$$

and No. of children in the school

$$= 180 + 90 = 270$$

$$\therefore \% \text{ of girls now} = \frac{180}{270} \times 100 = \frac{200}{3} \%$$

$$= 66\frac{2}{3} \%$$

**Question 10.**

Kumar bought a transistor for Rs. 960. He paid  $12\frac{1}{2}\%$  cash money. The rest he agreed to pay in 12 equal monthly instalments. How much will he pay each month ?

**Solution :**

Price of transistor = Rs. 960

Amount paid in cash =  $12\frac{1}{2}\%$  of Rs. 960

$$= \frac{25}{2 \times 100} \times 960 = \text{Rs. } 120$$

Balance amount = Rs. 960 – Rs. 120  
= Rs. 840

No. of instalments = 12

∴ Amount of each instalment  
= Rs. 840 ÷ 12 = Rs. 70

**Question 11.**

An ore contains 20% zinc. How many kg of ore will be required to get 45 kg of zinc ?

**Solution :**

In an ore, zinc = 20%

Let quantity of ore =  $x$

∴ 20% of  $x$  = 45 kg

$$\Rightarrow \frac{20}{100} \times x = 45 \quad \Rightarrow \frac{x}{5} = 45$$

$$\Rightarrow x = 45 \times 5 = 225$$

∴ quantity of ore = 225 kg

## EXERCISE 8 (C)

### Question 1.

The salary of a man is increased from Rs. 600 per month to Rs. 850 per month. Express the increase in salary as percent.

### Solution :

Original salary of a man = Rs. 600

Increased salary = Rs. 850

$$\begin{aligned}\therefore \text{Amount of increase} &= \text{Rs. } 850 - 600 \\ &= \text{Rs. } 250\end{aligned}$$

$$\begin{aligned}\text{Percentage increase} &= \frac{250 \times 100}{600} = \frac{125}{3} \\ &= 41\frac{2}{3}\%\end{aligned}$$

### Question 2.

Increase :

(i) 60 by 5%

(ii) 20 by 15%

(iii) 48 by 121 %

(iv) 80 by 140%

(v) 1000 by 3.5%

### Solution :

(i) Rate of increase = 5%

$$\begin{aligned}\therefore \text{Total increase} &= 5\% \text{ of } 60 = \frac{5}{100} \times 60 \\ &= 3\end{aligned}$$

$$\therefore \text{Increased number} = 60 + 3 = 63$$

(ii) Increase on 20 at the rate of 15%

$$= 20 \times \frac{15}{100} = 3$$

$$\therefore \text{Increased number} = 20 + 3 = 23$$

(iii) Increase on 48 by  $12\frac{1}{2}\%$   $= 48 \times \frac{25}{2}\%$

$$= 48 \times \frac{25}{2 \times 100} = 48 \times \frac{1}{8} = 6$$

$$\therefore \text{Increased number} = 48 + 6 = 54$$

(iv) Increase on 80 by 140%  $= 80 \times \frac{140}{100}$

$$= 112$$

$$\therefore \text{Increased number} = 80 + 112 = 192$$

(v) Increase on 1000 by 3.5%  $= 1000 \times \frac{3.5}{100}$

$$= 1000 \times \frac{35}{10 \times 100} = 35$$

$$\therefore \text{Increased number} = 1000 + 35$$

$$= 1035$$

### Question 3.

Decrease :

(i) 80 by 20%

(ii) 300 by 10%

(iii) 50 by 12.5%

**Solution :**

$$(i) \text{ Decrease on 80 by 20\%} = 80 \times \frac{20}{100} = 16$$

$$\therefore \text{Decreased number} = 80 - 16 = 64$$

$$(ii) \text{ Decrease on 300 by 10\%} = 300 \times \frac{10}{100} = 30$$

$$\therefore \text{Decreased number} = 300 - 30 = 270$$

$$(iii) \text{ Decrease on 50 by 12.5\%} = 50 \times \frac{12.5}{100}$$

$$= \frac{50 \times 125}{10 \times 100} = \frac{25}{4} = 6.25\%$$

$$\therefore \text{Decrease number} = 50 - 6.25$$

$$= 43.75$$

#### Question 4.

What number :

- (i) When increased by 10% becomes 88 ?
- (ii) When increased by 15% becomes 230 ?
- (iii) When decreased by 15% becomes 170 ?
- (iv) When decreased by 40% becomes 480 ?
- (v) When increased by 100% becomes 100 ?
- (vi) When decreased by 50% becomes 50 ?

**Solution :**

(i) Let the number be = 100

$$\text{Increase} = 10\% = 10$$

$$\begin{aligned}\therefore \text{Increased number} &= 100 + 10 \\ &= 110\end{aligned}$$

If increased number is 110, then original number = 100

and if increased number is 88, then original

$$\text{number} = \frac{100}{110} \times 88 = 80$$

(ii) Let the number be = 100

$$\text{Increase} = 15\% = 15$$

$$\therefore \text{Increased number} = 100 + 15 = 115$$

If increased number is 115, then original number = 100

and if increased number is 230, then original

$$\text{number} = \frac{100 \times 230}{115} = 200$$

(iii) Let the number be = 100

$$\text{Decrease} = 15\% = 15$$

$$\therefore \text{Decreased number} = 100 - 15 = 85$$

If decreased number is 85, then original number = 100

and if decreased number is 170, then original

$$\text{number} = \frac{100}{85} \times 170 = 200$$

(iv) Let the number be = 100

Decrease = 40% = 40

∴ Decreased number = 100 - 40 = 60

If decreased number is 60, then original number = 100

and if decreased number is 480, then original

$$\text{number} = \frac{100 \times 480}{60} = 800$$

(v) Let the number be = 100

Increase = 100% = 100

∴ Increased number = 100 + 100 = 200

If increased number is 200, then original number = 100

and if increased number is 100, then original

$$\text{number} = \frac{100 \times 100}{200} = 50$$

(vi) Let the number be = 100

Decrease = 50% = 50

∴ Decreased number = 100 - 50 = 50

If decreased number is 50, then original number = 100

and if decreased number is 50, then original

$$\text{number} = \frac{100 \times 50}{50} = 100$$

### Question 5.

The price of a car is lowered by 20% to Rs. 40,000. What was the original price ? Also, find the reduction in price.

### Solution :

Let original price of the car = Rs. 100

Reduction = 20% = Rs. 20

∴ Reduced price = Rs. 100 - 20 = Rs. 80

If reduced price is Rs. 80, then original price = Rs. 100

and if reduced price is Rs. 40,000 then original price =  $\frac{\text{Rs.}100 \times 40000}{80}$

= Rs. 50,000  
and reduction = Rs. 50000 – Rs. 40000  
= Rs. 10,000

**Question 6.**

**If the price of an article is increased by 25%, The increase is Rs. 10. Find the new price.**

**Solution :**

Let the price of an article = Rs. 100  
Increase = 25%  
∴ Increase = Rs. 25  
If an increased price = Rs. 100 + 25 = Rs. 125  
If increase is Rs. 25 then new price = Rs. 125  
and if increase is Rs. 10, then new price = Rs.  $\frac{125 \times 10}{25}$   
= Rs. 50

**Question 7.**

**If the price of an article is reduced by 10%, the reduction is Rs. 40. What is the old price ?**

**Solution :**

Let the original (old) price = Rs. 100  
Reduction = 10% = Rs. 10  
∴ If reduction is Rs. 10, then old price = Rs. 100  
and if reduction is Rs. 40, then old price = Rs.  $\frac{100 \times 40}{10}$  = Rs. 400

**Question 8.**

**The price of a chair is reduced by 25%. What is the ratio of:**

**(i) Change in price to the old price.**

**(ii) Old price to the new price.**

**Solution :**

Let old (original) price of a chair = Rs. 100  
Reduction = 25% = Rs. 25  
∴ Reduced price = Rs. 100 – Rs. 25 = Rs. 75  
(i) Ratio between change in price and old price = 25 : 100  
= 1:4 (Dividing by 25)  
(ii) Ratio between old price and new price = 100 : 75  
= 4:3 (Dividing by 25)

**Question 9.**

If  $x$  is 20% less than  $y$ , find :

$$(i) \frac{x}{y} \quad (ii) \frac{y-x}{y} \quad (iii) \frac{x}{y-x}$$

**Solution :**

$$\text{Let } y = 100$$

$$\text{then reduction} = 20\% = 20$$

$$\text{then } x = 100 - 20 = 80$$

$$(i) \frac{x}{y} = \frac{80}{100} = \frac{4}{5} \quad (\text{Dividing by } 20)$$

$$(ii) \frac{y-x}{y} = \frac{100-80}{100} = \frac{20}{100} = \frac{1}{5} \\ (\text{Dividing by } 20)$$

$$(iii) \frac{x}{y-x} = \frac{80}{100-80} = \frac{80}{20} = \frac{4}{1} = 4 \\ (\text{Dividing by } 20)$$

**Question 10.**

If  $x$  is 30% more than  $y$ ; find :

$$(i) \frac{x}{y} \quad (ii) \frac{y+x}{x} \quad (iii) \frac{y}{y-x}$$

**Solution :**

$$\text{Let } y = a$$

$$\text{Then } x = a \times \frac{100+30}{100} = a \times \frac{130}{100} = \frac{13}{10}a$$

$$\text{Now, } (i) \frac{x}{y} = \frac{\frac{13}{10}a}{a} = \frac{a \times 13}{10a} = \frac{13}{10}$$

$$(ii) \frac{y+x}{x} = \frac{a + \frac{13}{10}a}{\frac{13}{10}a} \\ = \frac{(10+13)a}{10 \times \frac{13}{10}a} = \frac{23a}{10} \times \frac{10}{13a} = \frac{23}{13}$$

$$(iii) \frac{y}{y-x} = \frac{a}{a - \frac{13}{10}a} = \frac{a}{\frac{-3}{10}a} \\ = \frac{a \times 10}{-3a} = -\frac{10}{3}$$

**Question 11.**

The weight of a machine is 40 kg. By mistake it was weighed as 40.8 kg. Find the error percent.

**Solution :**

Actual weight of machine = 40 kg

Errored weight = 40.8 kg

∴ Error in weight = 40.8 – 40 = 0.8 kg

$$\text{Error \%} = \frac{0.8 \times 100}{40} = \frac{8 \times 100}{10 \times 40} = 2\%$$

**Question 12.**

From a cask, containing 450 litres of petrol, 8% of the petrol was lost by leakage and evaporation. How many litres of petrol was left in the cask ?

**Solution :**

Original petrol in the cask = 450 litres

Leakage and evaporation = 8%

$$\begin{aligned} \therefore \text{Lost petrol} &= 8\% \text{ of } 450 \text{ litres} = \frac{8 \times 450}{100} \\ &= 36 \text{ litres} \end{aligned}$$

**Question 13.**

An alloy consists of 13 parts of copper, 7 parts of zinc and 5 parts of nickel. What is the percentage of each metal in the alloy?

**Solution :**

Copper = 13 parts, Zinc = 7 parts

Nickel = 5 parts

Total alloy = 13 + 7 + 5 = 25 parts

$$\text{Now, percentage of copper} = \frac{13}{25} \times 100 = 52\%$$

$$\text{Percentage of zinc} = \frac{7}{25} \times 100 = 28\%$$

$$\text{and percentage of nickel} = \frac{5}{25} \times 100 = 20\%$$

**Question 14.**

In an examination, first division marks are 60%. A student secures 538 marks and misses the first division by 2 marks. Find the total marks of the examination.

**Solution :**

Percentage for first division = 60%

A student secures 538 marks but misses the first division by 2 marks.

$$\therefore \text{Marks for first division} = 538 + 2 = 540$$

$$\therefore 60\% \text{ of total marks} = 540$$

$$\Rightarrow \frac{60}{100} \times \text{total marks} = 540$$

$$\Rightarrow \text{total marks} = \frac{540 \times 100}{60} = 900$$

**Question 15.**

Out of 1200 pupils in a school, 900 are boys and the rest are girls. If 20% of the boys and 30% of the girls wear spectacles, find :

(i) how many pupils in all, wear spectacles ?

(ii) what percent of the total number of pupils wear spectacles ?

**Solution :**

Total number of pupils = 1200

No. of boys = 900

and no. of girls = 1200 – 900 = 300

No. of boys who wear spectacles

$$= 20\% \text{ of } 900 = \frac{20}{100} \times 900 = 180$$

No. of girls who wear spectacles

$$= 30\% \text{ of } 300 = \frac{30}{100} \times 300 = 90$$

(i)  $\therefore$  Total number of pupils who wear spectacles = 180 + 90 = 270

(ii) Percentage of pupils who wear spectacles

$$= \frac{270 \times 100}{1200} = \frac{270}{12} = 22.5\%$$

**Question 16.**

Out of 25 identical bulbs, 17 are red, 3 are black and the remaining are yellow. Find the difference between the numbers of red and yellow bulbs and express this difference as percent.

**Solution :**

$$\text{Total number of bulbs} = 25$$

$$\text{Number of red bulbs} = 17$$

$$\text{Number of black bulbs} = 3$$

$$= 17 + 3 = 20$$

$$\therefore \text{Number of yellow bulbs} = 25 - 20 = 5 \text{ bulbs}$$

Difference between the number of red and yellow bulbs

$$= \text{No. of red bulbs} - \text{No. of yellow bulbs}$$

$$= 17 - 5 = 12$$

$\therefore$  Percentage difference

$$= \frac{\text{Difference in red and yellow bulbs}}{\text{Total number of bulbs}}$$

$$= \frac{12}{25} \times 100 = 48\%$$

**Question 17.**

A number first increases by 20% and then decreases by 20%. Find the percentage increase or decrease on the whole.

**Solution :**

Let the number be 100

In 1<sup>st</sup> condition,

Increase = 20% of 100

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

$$\begin{aligned} \therefore \text{Number after this increase} &= 100 + 20 \\ &= 120 \end{aligned}$$

In 2<sup>nd</sup> condition,

Decrease = 20% of 120

$$= \frac{20}{100} \times 120 = 24$$

$$\therefore \text{Number after this decrease} = 120 - 24 = 96$$

$$\Rightarrow \text{Total decrease on the whole} = 24 - 20 = 4$$

and the percentage decrease on the whole

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

**Question 18.**

A number is first decreased by 40% and then again decreased by 60%. Find the percentage increase or decrease on the whole.

**Solution :**

Let the number be 100

In first condition :

Decrease = 40% of 100

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

∴ Number after this decrease

$$= 100 - 40 = 60$$

In Second condition :

Decrease = 60% of 40

$$= \frac{60}{100} \times 40 = 24$$

∴ Number after the 2nd decrease

$$= 40 - 24 = 16$$

⇒ Total decrease on the whole

$$= 40 + 24 = 64$$

∴ Percentage decrease on the whole

$$= \frac{64}{100} \times 100 = 64\%$$

**Question 19.**

If 150% of a number is 750, find 60% of this number.

**Solution :**

Let the required number be  $x$

Now, 150% of  $x = 750$

$$\Rightarrow \frac{150}{100} \times x = 750$$

$$\Rightarrow x = \frac{750 \times 100}{150} = 500$$

Hence, the required number = 500

$$\text{Now, } 60\% \text{ of } 500 = 500 \times \frac{60}{100} = 300$$