CHAPTER 9

PERCENT AND PERCENTAGE

9.1 REVIEW

1. Percent

Percent means; ' **for every hundred** '.

The word percent is abbreviated as p.c.; and is denoted by the symbol %.

2. Percentage

A fraction, whose denominator is 100 is called a percentage and the numerator of such fraction is called the rate percent.

$\therefore \quad \frac{8}{100} = 8$ percent *i.e.* 8 out of 100.

Percent and percentage are used in the same sense.

3. To express a given number as percent, multiply by 100 and in the same step attach the percentage sign (%).

$\therefore \quad \frac{3}{5} = \frac{3}{5} \times 100\% = 60\%; \quad 0{\cdot}45 = 0{\cdot}45 \times 100\% = 45\%$ and so on.

4. To express a given percent into a fraction, divide by 100 and in the same step remove the sign of percentage.

$45\% = \frac{45}{100} = \frac{9}{20}$ (as a vulgar fraction) or $45\% = \frac{45}{100} = 0{\cdot}45$ (as a decimal fraction)

5. x as the percent of $y = \frac{x}{y} \times 100\%$ and x % of $y = \frac{x}{100} \times y$

(i) 5 as the percent of $20 = \frac{5}{20} \times 100\% = 25\%$ and

(ii) 5% of $20 = \frac{5}{100} \times 20 = 1$

6. (i) Increase % $= \frac{\text{Increase in quantity}}{\text{Original quantity}} \times 100\%$

(ii) Decrease % $= \frac{\text{Decrease in quantity}}{\text{Original quantity}} \times 100\%$

TEST YOURSELF

1. $\frac{7}{10} = \frac{7}{10} \times$ ..... % = ... % **2.** 0.087 = 0.087 × ..... % = ... %

3. 37.5% as a vulgar fraction = ...

4. 5.6% as a decimal fraction = ...

5. 32 as the percent of 40 = ... = ...

6. 12.5% of 80 m = ... = ...

7. A number is changed from 60 to 75

⇒ Increase in number = ... − ..... = ... and

increase % = ... = ...

8. A number is changed from 75 to 60

⇒ Decrease in number = ... − ..... = ... and

decrease % = ... = ...

Example 1 :

(i) Find, 36 is what percent of 144.

(ii) 80 is 32% of a certain number, find the number.

(iii) Evaluate : 16% of 150 – 25% of 84 + 8% of 550.

Solution :

(i) ***Direct method*** **:**

$$\text{The required percent} = \frac{36}{144} \times 100\% = 25\% \qquad \textbf{(Ans.)}$$

Alternative method **:**

Let x% of 144 = 36 $\Rightarrow \frac{x}{100} \times 144 = 36 \quad \Rightarrow x = \frac{36 \times 100}{144} = 25$

$\therefore$ **The required percent = 25%** **(Ans.)**

(ii) **Given :** 32% of a certain number = 80

$\Rightarrow \frac{32}{100} \times$ The number = 80 $\Rightarrow$ **The required number** $= 80 \times \frac{100}{32} = 250$ **(Ans.)**

Alternative method **:**

Let the required number be x

$\therefore$ 32% of x = 80 $\Rightarrow \frac{32}{100} \times x = 80$ *i.e.* $x = 80 \times \frac{100}{32} = 250$

$\therefore$ **The required number = 250** **(Ans)**

(iii) 16% of 150 – 25% of 84 + 8% of 550

$= \frac{16}{100} \times 150 - \frac{25}{100} \times 84 + \frac{8}{100} \times 550 = 24 - 21 + 44 = 47$ **(Ans.)**

Example 2 :

A man spends 65% of his salary and saves ₹ 525 per month. Find his monthly salary.

Solution :

Since, the man spends 65% of his salary

$\therefore$ He saves (100 – 65)% = 35% of his salary

Given : 35% of his monthly salary = ₹ 525

$\Rightarrow \frac{35}{100} \times$ his monthly salary = ₹ 525

$\therefore$ **His monthly salary** = ₹ $525 \times \frac{100}{35}$ = **₹ 1,500** **(Ans.)**

Alternative method **:**

Let the man's monthly salary be ₹ 100

$\therefore$ He spends = 65% of ₹ 100 = $\frac{65}{100} \times$ ₹ 100 = ₹ 65

and, saves = ₹ 100 – ₹ 65 = ₹ 35

Applying Unitary method :

When the man saves = ₹ 35, his monthly salary = ₹ 100

$\Rightarrow$ When the man saves = ₹ 1, his monthly salary = ₹ $\frac{100}{35}$

And, when the man saves = ₹ 525, his monthly salary = ₹ $\frac{100}{35} \times 525$ = ₹ 1,500

$\therefore$ **Man's monthly salary** = **₹ 1,500** . **(Ans.)**

Algebraic method :

Let the man's monthly salary = ₹ x

$\because$ He spends = 65% of ₹ x = ₹ $\frac{65x}{100}$

$\therefore$ He saves = ₹ x – ₹ $\frac{65x}{100}$ = ₹$(x - \frac{65x}{100})$

Given : $x - \frac{65x}{100} = 525 \Rightarrow \frac{100x - 65x}{100} = 525$

$\Rightarrow x = 525 \times \frac{100}{35} = 1500$

$\therefore$ **Man's monthly salary = ₹ 1,500** **(Ans.)**

Example 3 :

(i) A number 4·0 is wrongly read as 4·48; find the percentage error.

(ii) In a consignment of 500 articles, 70 articles are broken. Find the percentage of remaining articles.

Solution :

(i) $\because$ Error = 4·48 – 4·0 = 0·48

$\therefore$ **Percentage error** = $\frac{\text{Error}}{\text{Original number}} \times 100\% = \frac{0{\cdot}48}{4{\cdot}0} \times 100\% =$ **12%** **(Ans.)**

(ii) Since, 70 articles are broken,

$\Rightarrow$ the number of remaining articles = 500 – 70 = 430

$\therefore$ **Percentage of remaining articles** = $\frac{\text{No. of remaining articles}}{\text{Original no. of articles}} \times 100\%$

$= \frac{430}{500} \times 100\% =$ **86%** **(Ans.)**

Example 4 :

In an election between two candidates, one candidate secured 43% of the total votes polled and lost the election by 4900 votes. Find the total number of votes polled.

Solution :

Since, losing candidate secured 43% of the votes polled

$\therefore$ Winning candidate secured (100 – 43)% = 57% of the votes polled

and, difference of their votes = 57% – 43%

= 14% of the votes polled

Given : 14% of votes polled = 4900

$\Rightarrow \frac{14}{100} \times$ votes polled = 4900

$\therefore$ **The total no. of votes polled** = $4900 \times \frac{100}{14} =$ **35,000** **(Ans.)**

Alternative method :

Let the total number of votes polled = 100

$\therefore$ The losing candidate gets 43% of 100 = 43 votes

and, the winning candidate gets = 100 – 43 = 57 votes

The no. of votes by which the losing candidate has lost the election = 57 – 43 = 14.

Applying Unitary method :

When election is lost by 14 votes,
the total no. of votes polled = 100

⇒ when election is lost by 4900 votes,
the total no. of votes polled = $\frac{100}{14} \times 4900$ = 35,000 (Ans.)

Algebraic method :

Let the total number of votes polled = x

∴ The votes secured by losing candidate = 43% of x

and, the votes secured by winning
candidate = (100 – 43)% of x
= 57% of x.

Clearly, 57% of x – 43% of x = 4900

⇒ 14% of x = 4900

i.e. $\frac{14}{100} x = 4900$ *i.e.*, $x = 4900 \times \frac{100}{14} = 35000$

∴ The total number of votes polled = 35,000 (Ans.)

Example 8 :

The cost of a machine depreciates every year by 10% of its cost at the beginning of the year. If the present cost of the machine is ₹ 10,000; find its cost :

(i) after one year (ii) after 2 years.

Solution :

(i) Since, present cost of the machine = ₹ 10,000

and, depreciation in its cost in 1st year = 10% of ₹ 10,000 = ₹ 1,000

∴ The cost of the machine after one year = ₹ (10,000 – 1,000)
= ₹ 9,000 (Ans.)

(ii) **For 2nd year :**

The cost of machine at the beginning = ₹ 9,000

and, depreciation = 10% of ₹ 9,000 = ₹ 900

∴ The cost of the machine after two years = ₹ (9,000 – 900)
= ₹ 8,100 (Ans.)

TEST YOURSELF

8. A number is decreased by 20%; the resulting number is ..... of the original number.

9. A number is increased by 8%; the resulting number is ..... the original number.

10. ₹ 500 increases to ₹ 750; the increase (change) = ... and the percentage change = ...

11. ₹ 750 decreases to ₹ 500; the decrease (change) = ... and the percentage change = ...

EXERCISE 9 (A)

1. Evaluate :
   (i) 56% of 180 + 24% of 50 – 36% of 150
   (ii) 9.3% of 500 – 4.8% of 250 – 2.5% of 240

2. (i) A number is increased from 125 to 150; find the percentage increase.
   (ii) A number is decreased from 125 to 100; find the percentage decrease.

***Algebraic method* :**

Let the man's monthly salary = ₹ x

$\because$ He spends = 65% of ₹ x = ₹ $\frac{65x}{100}$

$\therefore$ He saves = ₹ x – ₹ $\frac{65x}{100}$ = ₹$(x - \frac{65x}{100})$

Given : $x - \frac{65x}{100} = 525 \Rightarrow \frac{100x - 65x}{100} = 525$

$\Rightarrow x = 525 \times \frac{100}{35} = 1500$

$\therefore$ **Man's monthly salary = ₹ 1,500** **(Ans.)**

Example 3 :

(i) A number 4·0 is wrongly read as 4·48; find the percentage error.

(ii) In a consignment of 500 articles, 70 articles are broken. Find the percentage of remaining articles.

Solution :

(i) $\because$ Error = 4·48 – 4·0 = 0·48

$\therefore$ **Percentage error** = $\frac{\text{Error}}{\text{Original number}} \times 100\% = \frac{0{\cdot}48}{4{\cdot}0} \times 100\% =$ **12%** **(Ans.)**

(ii) Since, 70 articles are broken,

$\Rightarrow$ the number of remaining articles = 500 – 70 = 430

$\therefore$ **Percentage of remaining articles** = $\frac{\text{No. of remaining articles}}{\text{Original no. of articles}} \times 100\%$

$= \frac{430}{500} \times 100\% =$ **86%** **(Ans.)**

Example 4 :

In an election between two candidates, one candidate secured 43% of the total votes polled and lost the election by 4900 votes. Find the total number of votes polled.

Solution :

Since, losing candidate secured 43% of the votes polled

$\therefore$ Winning candidate secured (100 – 43)% = 57% of the votes polled

and, difference of their votes = 57% – 43%

= 14% of the votes polled

Given : 14% of votes polled = 4900

$\Rightarrow \frac{14}{100} \times$ votes polled = 4900

$\therefore$ **The total no. of votes polled** = $4900 \times \frac{100}{14} =$ **35,000** **(Ans.)**

***Alternative method* :**

Let the total number of votes polled = 100

$\therefore$ The losing candidate gets 43% of 100 = 43 votes

and, the winning candidate gets = 100 – 43 = 57 votes

The no. of votes by which the losing candidate has lost the election = 57 – 43 = 14.

Applying Unitary method :

When election is lost by 14 votes,

the total no. of votes polled = 100

⇒ when election is lost by 4900 votes,

the total no. of votes polled = $\frac{100}{14} \times 4900 = 35{,}000$ **(Ans.)**

Algebraic method :

Let the total number of votes polled = x

∴ The votes secured by losing candidate = 43% of x

and, the votes secured by winning candidate = (100 – 43)% of x

= 57% of x.

Clearly, 57% of x – 43% of x = 4900

⇒ 14% of x = 4900

i.e. $\frac{14}{100}x = 4900$ *i.e.*, $x = 4900 \times \frac{100}{14} = 35000$

∴ **The total number of votes polled = 35,000** **(Ans.)**

Example 5 :

The cost of a machine depreciates every year by 10% of its cost at the beginning of the year. If the present cost of the machine is ₹ 10,000; find its cost :

(i) after one year (ii) after 2 years.

Solution :

(i) Since, present cost of the machine = ₹ 10,000

and, depreciation in its cost in 1st year = 10% of ₹ 10,000 = ₹ 1,000

∴ **The cost of the machine after one year** = ₹ (10,000 – 1,000)

= **₹ 9,000** **(Ans.)**

(ii) **For 2nd year :**

The cost of machine at the beginning = ₹ 9,000

and, depreciation = 10% of ₹ 9,000 = ₹ 900

∴ **The cost of the machine after two years** = ₹ (9,000 – 900)

= **₹ 8,100** **(Ans.)**

TEST YOURSELF

9. A number is decreased by 20%; the resulting number is ..... of the original number.

10. A number is increased by 8%; the resulting number is ..... the original number.

11. ₹ 500 increases to ₹ 750; the increase (change) = ... and the percentage change = ...

12. ₹ 750 decreases to ₹ 500; the decrease (change) = ... and the percentage change = ...

EXERCISE 9 (A)

1. Evaluate :
   (i) 55% of 160 + 24% of 50 – 36% of 150
   (ii) 9·3% of 500 – 4·8% of 250 – 2·5% of 240

2. (i) A number is increased from 125 to 150; find the percentage increase.
   (ii) A number is decreased from 125 to 100; find the percentage decrease.

3. Find :
   (i) 45 is what percent of 54 ?
   (ii) 2·7 is what percent of 18 ?
4. (i) 252 is 35% of a certain number, find the number.
   (ii) If 14% of a number is 315; find the number.
5. Find the percentage change, when a number is changed from :
   (i) 80 to 100 (ii) 100 to 80
   (iii) 6·25 to 7·50
6. An auctioneer charges 8% for selling a house. If the house is sold for ₹ 2,30,500. Find the charges of the auctioneer.
7. Out of 800 oranges, 50 are rotten. Find the percentage of good oranges.
8. A cistern contains 5 thousand litres of water. If 6% water is leaked. Find how many litres of water are left in the cistern.
9. A man spends 87% of his salary. If he saves ₹ 325; find his salary.
10. (i) A number 3·625 is wrongly read as 3·265; find the percentage error.
    (ii) A number $5{\cdot}78 \times 10^3$ is wrongly written as $5{\cdot}87 \times 10^3$; find the percentage error.
11. In an election, a candidate secured 58% of the votes polled and won the election by 18,336 votes. Find the total number of votes polled and the votes secured by each candidate.
12. In an election, a candidate secured 47% of votes polled and lost the election by 12,366 votes. Find the total votes polled and the votes secured by winning candidate.
13. The cost of a scooter depriciates every year by 15% of its value at the beginning of the year. If the present cost of the scooter is ₹ 8,000; find its cost :
    (i) after one year (ii) after 2 years.
14. In an examination, the pass mark is 40%. If a candidate gets 65 marks and fails by 3 marks; find the maximum marks.

    40% of the max. marks = 65 + 3

15. In an examination, a candidate secured 125 marks and failed by 15 marks. If the pass percentage was 35%; find the maximum marks.
16. In an objective type paper of 150 questions; John got 80% correct answers and Mohan got 64% correct answers.
    (i) How many correct answers did each get ?
    (ii) What percent is Mohan's correct answers to John's correct answers ?

Example 6 :

5% of the population of a certain town was killed in a bombardment and 7% of the remaining died in panic. If the population of the town is now 44175; find the population of the town at the beginning.

Solution :

Let the population of the town at the beginning be 100.

$\therefore$ Killed in bombardment = 5% of 100 = 5

Remainings = 100 – 5 = 95

$$\text{Died in panic} = 7\% \text{ of } 95 = \frac{7}{100} \times 95 = \frac{133}{20}$$

$$\text{Now remainings} = 95 - \frac{133}{20} = \frac{1767}{20}$$

Applying unitary method :

If the remainings are $\frac{1767}{20}$, population at the beginning = 100

If the remaining is 1, population at the beginning = $100 \times \frac{20}{1767}$

and, if the remainings are 44175, **population in the beginning** = $100 \times \frac{20}{1767} \times 44175$

= **50,000** **(Ans.)**

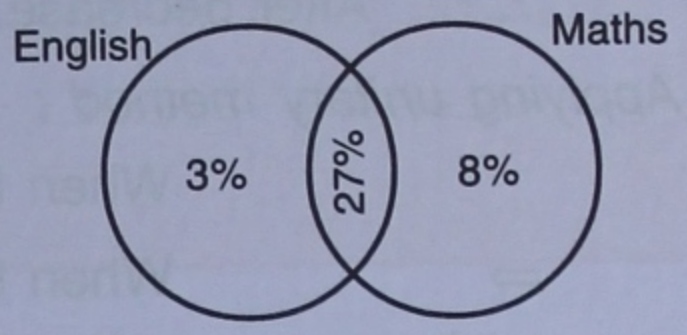
Example 7 :

In an examination, 30 percent candidates failed in English, 35 percent failed in Mathematics and 27 percent failed in both the subjects. Find :

(i) percentage of total failed.

(ii) percentage of total passed.

(iii) the total number of candidates; if 248 passed in both.



Solution :

(i) Since, failed only in English = 30% – 27% = 3%

failed only in Mathematics = 35% – 27% = 8%

and failed in both = 27%

∴ **Total failed** = 3% + 8% + 27% = **38%** **(Ans.)**

(ii) **Total passed** = (100 – 38)% = **62%** **(Ans.)**

(iii) Since,62% of the candidates = 248

$\Rightarrow \frac{62}{100} \times$ No. of candidates = 248

$\Rightarrow$ **No. of candidates** = $248 \times \frac{100}{62}$ = **400** **(Ans.)**

Example 8 :

A's income is 10 percent more than B's; how much percent is B's income less than A's ?

Solution :

Let B's income = ₹ 100

then, A's income = ₹ 100 + 10% of ₹ 100

= ₹ 100 + $\frac{10}{100} \times$ ₹ 100 = ₹ 110

If A's income is ₹ 110, B's income = ₹ 10 less than A [₹ (110 – 100)]

If A's income = ₹ 1, B's = ₹ $\frac{10}{110}$ less than A

and, if A's income = ₹ 100, B's is ₹ $\frac{10}{110} \times 100$ less than A

$\Rightarrow$ **B's income is $\frac{100}{11}$ % less *i.e.* $9\frac{1}{11}$ % less than A's.** **(Ans.)**

Example 9 :

If the price of wheat is increased by 20% today, at what percent should it be decreased tomorrow, so as to bring down the price back to the original ?

Solution :

Let the original price of wheat be ₹ 100

∴ Today's price = ₹ 100 + ₹ 20 = ₹ 120.

In order to bring down the price to original *i.e.* to ₹ 100; its price should be decreased by ₹ 120 – ₹ 100 = ₹ 20 on ₹ 120.

i.e. On ₹ 120, the price should be decreased by ₹ 20.

$\Rightarrow$ On ₹ 1, the price should be decreased by ₹ $\frac{20}{120}$

and, on ₹ 100, the price should be decreased by ₹ $\frac{20}{120} \times 100 =$ ₹ $\frac{50}{3} =$ ₹ $16\frac{2}{3}$

∴ **The price should be decreased by $16\frac{2}{3}$ %** **(Ans.)**

Example 10 :

A number decreased by 18% becomes 410. Find the number.

Solution :

Let the number be 100.

Since, decrease in number = 18% of 100 = 18

$\therefore$ After decrease, the number becomes = 100 – 18 = 82.

Applying unitary method :

When the decreased number = 82, the original number = 100

$\Rightarrow$ When the decreased number = 1, the original number = $\frac{100}{82}$

and, when the decreased number = 410,

the original number = $\frac{100}{82} \times 410 = 500$ **(Ans.)**

***Alternative method** (Algebraic method) :*

Let the original number be x.

$\therefore$ $x - 18\%$ of $x = 410 \Rightarrow x - \frac{18x}{100} = 410$

i.e. $\frac{100x - 18x}{100} = 410 \Rightarrow \frac{82x}{100} = 410$ *i.e.* $x = 410 \times \frac{100}{82} = 500$

$\therefore$ **The original number = 500** **(Ans.)**

Direct method :

If a number is decreased by x%,

the new number = $\left(\frac{100 - x}{100}\right) \times$ the original number.

and, if a number is increased by x%,

the new number = $\left(\frac{100 + x}{100}\right) \times$ the original number.

Here, the decrease in number = 18% and the new (decreased) number is 410.

$\therefore$ The new number = $\frac{100 - 8}{100} \times$ the original number

$\Rightarrow$ $410 = \frac{82}{100} \times$ the original number

$\Rightarrow$ **The original no.** = $\frac{410 \times 100}{82} =$ **500** **(Ans.)**

Example 11 :

Two numbers are respectively 10% and 25% more than a third number. What percent is the first of the second ?

Solution :

Let the third number be 100.

$\therefore$ The first number = 100 + 10% of 100 = 110

and, the second number = 100 + 25% of 100 = 125.

$\therefore$ **The first no. as the percent of the second** = $\frac{110}{125} \times 100\% =$ **88%** **(Ans.)**

TEST YOURSELF

13. A number is first increased by 20% and then again increased by 10%. The resutling number is $\frac{120}{100} \times \frac{110}{100}$ of the .....

14. A number is first increased by 30% and then decreased by 20%. The resulting number is ..... of the original number.

15. A is 80% of B, then B is .....% of A = ...

16. A is 40% more than B, then B is ....

EXERCISE 9 (B)

1. A man bought a certain number of oranges; out of which 13 percent were rotten. He gave 75% of the remaining in charity and still has 522 oranges left. Find how many had he bought ?
2. 5% pupil in a town died due to some diseases and 3% of the remaining have left the town. If 2,76,450 pupil are still in the town; find the original number of pupil in the town.
3. In a combined test in English and Physics; 36% candidates failed in English; 28% failed in Physics and 12% in both; find :
   (i) the percentage of passed candidates.
   (ii) the total number of candidates appeared, if 208 candidates have failed.
4. In a combined test in Maths and Chemistry; 84% candidates passed in Maths; 76% in Chemistry and 8% failed in both. Find :
   (i) the percentage of failed candidates.
   (ii) if 340 candidates passed in the test; then how many appeared ?
5. A's income is 25% more than B's. Find, B's income is how much percent less than A's.
6. Mona is 20% younger than Neetu. How much percent is Neetu older than Mona ?
7. If the price of sugar is increased by 25% today. By what percent should it be decreased tomorrow to bring the price back to the original ?
8. A number increased by 15% becomes 391. Find the number.
9. A number decreased by 23% becomes 539. Find the number.
10. Two numbers are respectively 20 percent and 50 percent more than a third number. What percent is the second of the first ?
11. Two numbers are respectively 20 percent and 50 percent of a third number. What percent is the second of the first ?
12. Two numbers are respectively 30 percent and 40 percent less than a third number. What percent is the second of the first ?

EXERCISE 9 (C)

1. A bag contains 8 red balls, 11 blue balls and 6 green balls. Find the percentage of blue balls in the bag.
2. Mohan gets ₹ 1,350 from Geeta and ₹ 650 from Rohit. Out of the total money that Mohan gets from Geeta and Rohit, what percent does he get from Rohit ?
3. The monthly income of a man is ₹ 16,000. 15 percent of it is paid as income-tax and 75% of the remainder is spent on rent, food, clothing, etc. How much money is still left with the man ?
4. A number is first increased by 20% and the resulting number is then decreased by 10%. Find the overall change in the number as percent.
5. A number is increased by 10% and the resulting number is again increased by 20%. What is the overall percentage increase in the number ?
6. During 2003, the production of a factory decreased by 25%. But, during 2004, it (production) increased by 40% of what it was at the beginning of 2004. Calculate the resulting change (increase or decrease) in production during these two years.
7. Last year, oranges were available at ₹ 24 per dozen; but this year, they are available at ₹ 50 per score. Find the percentage change in the price of oranges 1 score = 20.
8. In an examination, Kavita scored 120 out of 150 in Maths, 136 out of 200 in English and 108 out of 150 in Science. Find her percentage score in each subject and also on the whole (aggregate).

9. A is 25% older than B. By what percent is B younger than A ?

10. (i) Increase 180 by 25%.
    (ii) Decrease 140 by 18%.

11. In an election, three candidates contested and secured 29200, 58800 and 72000 votes. Find the percentage of votes scored by winning candidate.

12. (i) A number when increased by 23% becomes 861; find the number.
    (ii) A number when decreased by 16% becomes 798; find the number.

13. The price of sugar is increased by 20%. By what percent must the consumption of sugar be decreased so that the expenditure on sugar may remain the same ?

ANSWERS

TEST YOURSELF

1. 100, 70 **2.** 100, 8·7 **3.** $\frac{37{\cdot}5}{100} = \frac{375}{1000} = \frac{3}{8}$ **4.** $\frac{5{\cdot}6}{100} = 0{\cdot}056$ **5.** $\frac{32}{40} \times 100\%$, 80% **6.** $\frac{12{\cdot}5}{100} \times 80$ m, 10 m **7.** 75, 60, 15, $\frac{15}{60} \times 100\%$, 25% **8.** 75, 60, 15, $\frac{15}{75} \times 100\%$, 20% **9.** 80% **10.** 108% **11.** ₹ 250, $\frac{250}{500} \times 100\% = 50\%$ **12.** ₹ 250, $\frac{250}{750} \times 100\%$, $33\frac{1}{3}\%$ **13.** orginal number **14.** $\frac{130}{100} \times \frac{80}{100}$ **15.** $\frac{100}{80} \times 100\%$, 125% of A **16.** $\frac{40}{140} \times 100\%$ less than A

EXERCISE 9(A)

1. (i) 46 (ii) 28·5 **2.** (i) 20% (ii) 20% **3.** (i) $83\frac{1}{3}\%$ (ii) 15% **4.** (i) 720 (ii) 2250 **5.** (i) 25% increase (ii) 20% decrease (iii) 20% increase **6.** ₹ 18,440 **7.** $93\frac{3}{4}\%$ **8.** 4,700 litres **9.** ₹ 2,500 **10.** (i) 9·93% (ii) 1·56% **11.** 1,14,600; 66,468 and 48,132 **12.** 2,06,100 and 1,09,233 **13.** (i) ₹ 6,800 (ii) ₹ 5,780 **14.** 170 **15.** 400 **16.** (i) John = 120; Mohan = 96 (ii) 80%.

EXERCISE 9(B)

1. 2,400 **2.** 3,00,000 **3.** (i) 48% (ii) 400 **4.** (i) 32% (ii) 500 **5.** 20% **6.** 25% **7.** 20% **8.** 340 **9.** 700 **10.** 125% **11.** 250% **12.** $85\frac{5}{7}\%$

EXERCISE 9(C)

1. 44% **2.** 32·5% **3.** ₹ 3,400 **4.** 8% increase **5.** 32% **6.** 5% increase **7.** 25% increase **8.** Maths = 80%, English = 68% and Science = 72%. 72·8% **9.** 20% **10.** (i) 225 (ii) 114·8 **11.** 45% **12.** (i) 700 (ii) 950 **13.** $16\frac{2}{3}\%$.