1. Life Mathematics

Exercise 1.1

1 A. Question

There are 5 oranges in a basket of 25 fruits. The percentage of oranges is ___

A. 5%

B. 25%

C. 10%

D. 20%

Answer

Total number of fruits in basket is 25

Number of oranges in the basket is 5

∴ Percentage of oranges in the basket = $\frac{\text{No.of orange}}{\text{Total no.of fruits}} \times 100\ \%$

$= \frac{5}{25} \times 100\ \%$

$= 20\ \%$

Option D is the correct answer.

1 B. Question

2/25 = _____ %.

A. 25

B. 4

C. 8

D. 15

Answer

Here, they asked that 2 is what percentage of 25.

$\frac{2}{25} = \frac{2}{25} \times 100\ \%$

$= \frac{200}{25}\ \%$

= 8 %

Option C is the correct answer.

1 C. Question

15% of the total number of biscuits in a bottle is 30. The total number of biscuits is _____.

A. 100

B. 200

C. 150

D. 300

Answer

Given that 15% of the total number of biscuits in a bottle is 30.

$\Rightarrow \frac{30}{\text{Total no.of biscuits}} = \frac{15}{100}$

Total no. of biscuits $= \frac{30 \times 100}{15}$

⇒ Total no. of biscuits = 200

(OR)

Shortcut method:

Given that 15 % = 30 biscuits

Dividing both sides with 15

1 % = 2 biscuits

Since 100% is total no. of biscuits

Multiply by 100 on both sides

100 % = 200 biscuits

∴ Total no. of biscuits = 200

Option B is the correct answer.

1 D. Question

The price of a scooter was Rs. 34,000 last year. It has increased by 25% this year. Then the increase in price is _____.

A. Rs. 6,500

B. Rs. 8,500

C. Rs. 8,000

D. Rs. 7,000

Answer

Given,

Price of scooter is Rs. 34,000 in the last year

They said that current price is increased by 25% when compared to the last year.

That means the increased price is 25% of 34,000

$\Rightarrow \frac{25}{100} \times 34{,}000$

$= 25 \times 340$

$= 8500$

Option B is the correct answer.

1 E. Question

A man saves Rs. 3,000 per month from his total salary of Rs. 20,000. The percentage of his savings is _____ .

A. 15%

B. 5%

C. 10%

D. 20%

Answer

Total salary of the man is 20,000 rupees

He saves 3,000 rupees per month

percentage of his savings $= \frac{\text{savings}}{\text{Total salary}} \times 100\ \%$

$= \frac{3{,}000}{20{,}000} \times 100\ \%$

$= \frac{3{,}000}{200}\%$

$= 15\%$

Option A is the correct answer.

2 A. Question

20% of the total quantity of oil is 40 liters. Find the total quantity of oil in liters.

Answer

Given that 20% of the total quantity of oil is 40 liters.

$$\Rightarrow \frac{40}{\text{Total quantity of oil}} = \frac{20}{100}$$

$$\text{Total quantity of oil} = \frac{40 \times 100}{20}$$

⇒ Total quantity of oil = 200 liters

2 B. Question

25% of a journey covers 5,000 km. How long is the whole journey?

Answer

Given that 25% of total journey is 5,000 km

$$\frac{25}{100} = \frac{5,000}{\text{Total Journey}}$$

$$\text{Total journey} = \frac{5,000 \times 100}{25}$$

= 5,000 × 4

= 20,000

2 C. Question

3.5% of an amount is Rs. 54.25. Find the amount.

Answer

Given that 3.5% of an amount is Rs. 54.25

$$3.5 = \frac{54.25}{\text{Total amount}} \times 100\ \%$$

$$\text{Total amount} = \frac{54.25}{3.5} \times 100\%$$

Total amount = 1,550

2 D. Question

60% of the total time is 30 minutes. Find the total time.

Answer

Given that 60% of an total time is 30 minutes

$$60 = \frac{30}{\text{Total time}} \times 100\ \%$$

Total time = $\frac{30}{60} \times 100\%$

Total time = 50 minutes

2 E. Question

4% sales tax on the sale of an article is Rs. 2. What is the amount of sale?

Answer

Given that 4 % of sales tax is Rs. 2

$$\frac{4}{100} = \frac{2}{\text{Amount of Sale}}$$

Amount of Sale = $\frac{2\times100}{4}$

= 50

∴ Amount of Sale is Rs. 50

3. Question

Meenu spends Rs. 2000 from her salary for recreation which is 5% of her salary. What is her salary?

Answer

Given that Meenu spends 5% of her salary which is Rs. 2000

$$\frac{5}{100} = \frac{2000}{\text{Total Salary}}$$

Total Salary = $\frac{2000\times100}{5}$

Total Salary = 40,000

4. Question

25% of the total mangoes which are rotten is 1,250. Find the total number of mangoes in the basket. Also, find the number of good mangoes.

Answer

Given 1250 mangoes are rotten which is 25 % of the total

25 % = 1250 mangoes

Multiply by 4 we will get 100% which is total amount of mangoes

4 × 25 % = 4 × 1250

100 % = 5000

Total mangoes are 5000

If 25 % mangoes are rotten in a basket then (100-25) % will be good

Good mangoes (75 %) = 100% -25%

= 5000-1250

= 3750

∴ 3750 mangoes are good.

5. Question

The marks obtained by Rani in her twelfth standard exams are tabulated below. Express these marks as percentages.

Subjects	Maximum marks	Marks obtained	Percentage of marks (out of 100)
(i) English	200	180	
(ii) Tamil	200	188	
(iii) Mathematics	200	195	
(iv) Physics	150	132	
(v) Chemistry	150	142	
(vi) Biology	150	140	

Answer

They have given us the marks obtained and max. marks of that subject. We need to find the percentage of marks obtained in each subject.

i. ENGLISH:

Marks obtained = 180

Max. marks in English = 200

Percentage of marks scored in English = $\frac{\text{Marks obtained}}{\text{Max.marks}} \times 100\ \%$

= $\frac{180}{200} \times 100\ \%$

= 90%

ii. TAMIL

Marks obtained = 188

Max. marks in Tamil = 200

Percentage of marks scored in Tamil = $\frac{\text{Marks obtained}}{\text{Max.marks}} \times 100\ \%$

= $\frac{188}{200} \times 100\ \%$

= 94%

iii. Mathematics

Marks obtained = 195

Max. marks in mathematics = 200

Percentage of marks scored in mathematics = $\frac{\text{Marks obtained}}{\text{Max.marks}} \times 100\ \%$

= $\frac{195}{200} \times 100\ \%$

= 97.5%

iv. Physics

Marks obtained = 132

Max. marks in Physics = 150

Percentage of marks scored in Physics = $\frac{\text{Marks obtained}}{\text{Max.marks}} \times 100\ \%$

= $\frac{132}{150} \times 100\ \%$

= 88%

v. Chemistry

Marks obtained = 142

Max. marks in Chemistry = 150

Percentage of marks scored in Chemistry = $\frac{\text{Marks obtained}}{\text{Max.marks}} \times 100\ \%$

= $\frac{142}{150} \times 100\ \%$

= 94.66%

vi. Biology

Marks obtained = 140

Max. marks in Biology = 150

Percentage of marks scored in Biology = $\frac{\text{Marks obtained}}{\text{Max.marks}} \times 100\ \%$

= $\frac{140}{150} \times 100\ \%$

= 93.33%

6. Question

A school cricket team played 20 matches against another school. The first school won 25% of them. How many matches did the first school win?

Answer

Given that total 20 matches were played.

Out of that 25% of the matches are won by first school.

We should know that 25% is $\frac{1}{4}$ of 100%

That means $\frac{1}{4}$ of total matches gives us 25% of matches

$\Rightarrow \frac{1}{4} \times 20 = 5$

∴ first school won 5 matches.

7. Question

Rahim deposited Rs. 10,000 in a company which pays 18% simple interest p.a. Find the interest he gets for a period of 5 years.

Answer

Simple interest is same as percentages

The company pays 18% simple interest for his 10,000 every year

First year - $\frac{18}{100} \times 10000 = 1{,}800$

In simple interest every year same interest will be paid.

So, for five years = 5 × 1,800

= 9,000

He will get Rs. 9,000 as interest for the period of 5 years.

8. Question

The marked price of a toy is Rs. 1,200. The shop keeper gave a discount of 15%. What is the selling price of the toy?

Answer

Given price of toy is Rs. 1,200

The shop keeper offered a discount of 15%.

So, the current price is (100-15) % of previous price

= 85% of 1,200

$= \frac{85}{100} \times 1,200$

= 1,020

After the discount of 15% the toy price is Rs. 1,020

9. Question

In an interview for computer firm 1,500 applicants were interviewed. If 12% of them were selected, how many applicants were selected? Also find the number of applicants who were not selected.

Answer

No. of applicants = 1,500

No. of persons selected is 12% of applicants

$\Rightarrow \frac{12}{100} \times 1,500$

= 180

180 applicants were selected out of 1,500 applicants

If 180 selected means remaining are rejected

⇒ (1,500 – 180) are not selected

1,320 applicants were not selected.

10. Question

An alloy consists of 30% copper and 40% zinc and the remaining is nickel. Find the amount of nickel in 20 kilograms of the alloy.

Answer

The alloy weighs totally 20 kgs.

The alloy consists of 30% copper and 40% zinc and the remaining is nickel.

From the above we can say that 30% nickel is there in an alloy

$\Rightarrow \frac{30}{100} \times 20$

⇒ 60

= 60 kg.

The amount of nickel in 20 kilograms of the alloy is 60 Kg.

11. Question

Pandian and Thamarai contested for the election to the Panchayat committee from their village. Pandian secured 11,484 votes which was 44% of the total votes. Thamarai secured 36% of the votes. Calculate (i) the number of votes cast in the village and (ii) the number of voters who did not vote for both the contestants.

Answer

i) Given that Pandian secured 11,484 of votes which is 44% of the total votes

$\Rightarrow \frac{44}{100} = \frac{11,484}{\text{total votes}}$

Total votes = $\frac{11,484 \times 100}{44}$ = 26,100

ii) They have given that Pandian, Thamarai has got 44%, 36% of votes respectively

It clearly shows that 20% of votes was not casted

That means $\frac{80}{100} \times 26,100$

5,220 votes were not casted.

12. Question

A man spends 40% of his income for food, 15% for clothes and 20% for house rent and saves the rest. What is the percentage of his saving? If his income is Rs. 34,400, find the amount of his savings.

Answer

Given income of the man is Rs. 34,400

He spends 40% for food, 15% for clothes and 20% for house rent and saves the remaining of his income.

Savings = 100 – 40 – 15 – 20 = 25%

He saves 25% of his income

That means he saves $\frac{1}{4}^{\text{th}}$ of his income.

$\Rightarrow \frac{1}{4} \times 34,400$ = 8,600

He saves 8,600 which is 25% of his income.

13. Question

Jyothika secured 35 marks out of 50 in English and 27 marks out of 30 in Mathematics. In which subject did she get more marks and how much?

Answer

Given Jyothika marks in English is 35 out of 50

Which means 35 is marks secured and 50 is the max. marks

Percentage of marks in English = $\frac{\text{marks secured}}{\text{Max.marks}} \times 100\%$

$= \frac{35}{50} \times 100\% = 70\%$

Jyothika in Mathematics was 27 out of 30

Percentage of marks in Mathematics = $\frac{\text{marks secured}}{\text{Max.marks}} \times 100\%$

$= \frac{27}{30} \times 100\% = 90\%$

She scored 20% more marks in mathematics than in English.

14. Question

A worker receives Rs. 11,250 as bonus, which is 15% of his annual salary. What is his monthly salary?

Answer

Given that worker receives 15% of his annual salary as bonus, which is Rs. 11,250

$\Rightarrow \frac{11,250}{\text{Annual salary}} = \frac{15}{100}$

Annual salary = $\frac{11,250 \times 100}{15} = 75,000$

Monthly salary = $\frac{75,000}{12} = 6,250$

∴ worker get paid 6,250 monthly

15. Question

The price of a suit is increased from Rs. 2,100 to Rs. 2,520. Find the percentage of increase.

Answer

Original price of the suit is Rs. 2,100

Current price of the suit is Rs. 2,520

Increase in price = original Price – Previous price

= 2,520 – 2,100 = 420

Percentage increase in price = $\frac{\text{increase in price}}{\text{Original price}} \times 100\%$

= $\frac{420}{2,100} \times 100\ \%$

= 20%

Exercise 1.2

1. Question

Find the Cost price / Selling price.

Cost price	Selling price	Profit	Loss
(i) Rs. 7,282		Rs. 208	
(ii)	Rs. 572	Rs. 72	
(iii)9,684			Rs. 684
(IV)	Rs. 1,973	Rs. 273	
(v)Rs. 6,76,000			Rs. 18,500

Answer

(i) Cost price = Rs. 7282

Profit = Rs. 208

Profit = Selling price - Cost price

Selling price = profit + cost price

= 208 + 7282 = 7490

(ii) Profit = Rs. 72

Selling price = Rs. 572

Profit = Selling price - Cost price

Cost price = Selling price – Profit

= 572 – 72 = 500

(iii) Cost price = Rs. 9684

Loss = Rs. 684

Loss = Cost Price – Selling price

Selling price = cost price - loss

= 9684 – 684 = 9,000

(iv) Profit = Rs. 273

Selling price = Rs. 1973

Profit = Selling price - Cost price

Cost price = Selling price – Profit

= 1973 – 273 = 1700

(v) Cost price = Rs. 6,76,000

Loss = Rs. 18,500

Loss = Cost Price – Selling price

Selling price = cost price - loss

= 6,76,000 – 18,500 = 6,57,500

2. Question

Fill up the appropriate boxes and leave the rest.

C.P	S.P	Profit& Profit %	Loss& Loss %
(i) Rs.320	Rs. 384		
(ii) Rs. 2,500	Rs. 2,700		
(iii)Rs. 380	Rs. 361		
(IV) Rs. 40			Rs. 2 Losses
(v)Rs. 5,000		Rs. 500 Profit	

Answer

1. Cost price = 320

Selling price = 384

Since selling price < Cost price

Profit = Selling Price - Cost price

= 384 – 320 = 64

Profit % = $\frac{\text{profit}}{\text{cost price}} \times 100\%$

= $\frac{64}{320} \times 100\%$

= 20%

2. Cost price = 2500

Selling price = 2700

Since selling price < Cost price

Profit = Selling Price - Cost price

= 2700 – 2500 = 200

Profit % = $\frac{\text{profit}}{\text{cost price}} \times 100\%$

= $\frac{200}{2500} \times 100\%$

= 8%

3. Cost price = 380

Selling price = 361

Since selling price > Cost price

Loss = Cost price - Selling Price

= 380 – 361 = 19

loss % = $\frac{\text{loss}}{\text{cost price}} \times 100\%$

= $\frac{19}{380} \times 100\%$

= 5%

4. Cost price = 40

Loss = 2

Loss = Cost price - Selling Price

Selling Price = Cost price – Loss

= 40 – 2 = 38

loss % = $\frac{\text{loss}}{\text{cost price}} \times 100\%$

= $\frac{2}{40} \times 100\%$

= 5%

5. Cost price = 5000

Profit = 500

Profit = Selling Price - Cost price

Selling Price = Cost price + Profit

= 5,000 – 500 = 5,500

Profit % = $\frac{\text{profit}}{\text{cost price}} \times 100\%$

= $\frac{500}{5000} \times 100\%$

= 10%

3 A. Question

Find the S.P. if a profit of 5% is made on

a bicycle of Rs. 700 with Rs. 50 as overhead charges.

Answer

Cost price of the Bicycle is 700 + 50 = 750

Profit % = 5%

Profit % = $\frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\%$

5 = $\frac{S.P - 750}{750} \times 100$

$\frac{5 \times 750}{100} + 750$ = S.P

Selling Price = 787.5

3 B. Question

Find the S.P. if a profit of 5% is made on

a computer table bought at Rs. 1,150 with Rs. 50 as transportation charges.

Answer

Cost price of computer table is 1150 + 50 = 1200

Profit % = 5%

Profit % = $\frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\%$

5 = $\frac{S.P - 1200}{1200} \times 100$

$\frac{5 \times 1200}{100} + 1200$ = S.P

Selling Price = 1,260

3 C. Question

Find the S.P. if a profit of 5% is made on

a table-top wet grinder bought for Rs. 2,560 and an expense of Rs. 140 on repair charges.

Answer

Cost price of table-top wet grinder is 2560 + 140 = 2700

Profit % = 5%

$$\text{Profit \%} = \frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\%$$

$$5 = \frac{\text{S.P} - 2700}{2700} \times 100$$

$$\frac{5 \times 2700}{100} + 2700 = \text{S.P}$$

Selling Price = 2,835

4. Question

By selling a table for Rs. 1,320, a trader gains 10%. Find the C.P. of the table.

Answer

Selling Price = 1320

Profit% = 10%

$$\text{Profit \%} = \frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\%$$

$$10 = \frac{1320 - \text{C.P}}{\text{C.P}} \times 100\%$$

C.P = 10(1320 – C.P)

11 C.P = 13200

C.P = 1,200

5. Question

The cost price of 16 note books is equal to the selling price of 12 note books. Find the gain percent.

Answer

Given, C.P of 16 note books is equal to the S.P of 12 note books

16 C.P = 12 S.P

$$\text{C.P} = \frac{3}{4}\,\text{S.P}$$

Where, C.P – Cost price

S.P – Selling Price

Gain = S.P – C.P

$= S.P - \frac{3}{4} S.P$

$= \frac{1}{4} S.P$

$\text{Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100\%$

$= \frac{\frac{1}{4} S.P}{\frac{3}{4} S.P} \times 100\%$

$= \frac{1}{3} \times 100\%$

$= 33.33\%$

6. Question

A man sold two articles at Rs. 375 each. On the first article, he gains 25% and on the other, he loses 25%. How much does he gain or lose in the whole transaction? Also, find the gain or loss percent in the whole transaction.

Answer

Let x, y be the two articles.

Selling price of both the articles($S.P_x$, $S.P_y$) is 375

$S.P_x$, $S.P_y$ means selling price of article X, Y respectively

$C.P_x$, $C.P_y$ means Cost price of article X, Y respectively

on selling article X he gets 25% profit which means the selling price is 125% of $C.P_x$

$375 = 125\%\ C.P_x$

$375 = \frac{125}{100} \times C.P_x$

$C.P_x = \frac{4 \times 375}{5} = 300$

on selling article Y he gets 25% loss which means the selling price is 75% of $C.P_y$

$375 = 75\%\ C.P_y$

$375 = \frac{75}{100} \times C.P_y$

$C.P_y = \frac{4 \times 375}{3} = 500$

$C.P = C.P_x + C.P_y$

$= 300 + 500 = 800$

$S.P = S.P_x + S.P_y$

$= 375 + 375 = 750$

Loss = C.P – S.P

= 800 – 750 = 50

$\text{loss \%} = \frac{\text{loss}}{\text{cost price}} \times 100\%$

$= \frac{50}{800} \times 100\%$

= 6.25%

7. Question

Anbarasan purchased a house for Rs. 17,75,000 and spent Rs. 1,25,000 on its interior decoration the house to make a profit of 20%. Find the S.P. of the house.

Answer

Cost price of house is 17,75,000

Interior decoration is 1,25,000

∴ total cost of house will become 17,75,000 + 1,25,000

= 19,00,000

Profit % = 20%

$\text{Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100\%$

$20 = \frac{\text{profit}}{19{,}00{,}000} \times 100$

$\frac{19{,}00{,}000 \times 20}{100} = \text{profit}$

Profit = 3,80,000

Profit = S.P - C.P

3,80,000 = S.P – 19,00,000

S.P = 22,80,000

8. Question

After spending Rupees sixty thousand for remodeling a house, Amla sold a house at a profit of 20%. If the selling price was Rupees forty-two lakhs, how much did she spend to buy the house?

Answer

Selling price (S.P) = 42,00,000

Spent on remodeling = 60,000

Profit % = 20%

$$\text{Profit \%} = \frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\%$$

$$20 = \frac{42{,}00{,}000 - \text{C.P}}{\text{C.P}} \times 100\%$$

2×C.P = 10(42,00,000 – C.P)

12 C.P = 4,20,00,000

C.P = 35,00,000

Cost Price = Cost price of house + other expenses

35,00,000 = C.P of house + 60,000

C.P of house = 34,40,000

9. Question

Jai kumar bought a plot of land in the outskirts of the city for Rs. 21,00,000. He built a wall around it for which he spent Rs. 1,45,000. And then he wants to sell it at Rs. 25,00,000 by making an advertisement in the newspaper which costs him Rs. 5,000. Now, find his profit percent.

Answer

Purchasing cost of the land = 21,00,000

Cost for building a wall = 1,45,000

Advertisement cost = 5,000

Total cost price of the plot = 21,00,000 + 1,45,000 + 5,000

= 22,50,000

Selling price = 25,00,000

Profit = Selling price - cost price

= 25,00,000 – 22,50,000 = 2,50,000

Profit % = $\frac{\text{profit}}{\text{cost price}} \times 100\%$

= $\frac{2,50,000}{22,50,000} \times 100\%$

= 11.11%

10. Question

A man sold two varieties of his dog for Rs. 3,605 each. On one he made a gain of 15% and on the other a loss of 9%. Find his overall gain or loss.

[Hint: Find C.P. of each]

Answer

Let x, y be the two varieties of dogs.

Selling price of both the varieties ($S.P_x$, $S.P_y$) is 3605

$S.P_x$, $S.P_y$ means selling price of varieties X, Y respectively

$C.P_x$, $C.P_y$ means Cost price of varieties X, Y respectively

on selling variety X dog he gets 15% profit which means the selling price is 115% of $C.P_x$

3605 = 115% $C.P_x$

3605 = $\frac{115}{100} \times C.P_x$

$C.P_x = \frac{100 \times 3605}{115}$ = 3134.78

on selling variety Y dog he gets 9% loss which means the selling price is 91% of $C.P_y$

3605 = 91% $C.P_y$

3605 = $\frac{91}{100} \times C.P_y$

$C.P_y = \frac{100 \times 3605}{91}$ = 3,961.53

$C.P = C.P_x + C.P_y$

= 3134.78 + 3,961.53 = 7096 (approx.)

$S.P = S.P_x + S.P_y$

= 3605 + 3605 = 7,210

Profit = S.P - C.P

= 7,210 – 7,096 = 114 (approx.)

Exercise 1.3

1 A. Question

The discount is always on the _____.

A. Marked Price

B. Cost Price

C. Selling Price

D. Interest

Answer

Discount is always given on the marked price of the product.

Selling price is the Discount on marked price.

Option A is the correct answer.

1 B. Question

If M.P. = Rs. 140, S.P. = Rs. 105, then Discount = _____.

A.Rs. 245

B.Rs. 25

C.Rs. 30

D.Rs. 35

Answer

Selling price is the Discount on marked price.

Marked price = Selling price + Discount.

Discount = Marked price - Selling price

= 140 – 105 = 35

Option D is the correct answer.

1 C. Question

_____ = Marked Price – Discount.

A. Cost Price

B. Selling Price

C. List Price

D. Market price

Answer

Selling price is the Discount on marked price.

Marked price = Selling price + Discount.

Selling price = Marked Price – Discount

Option B is the correct answer.

1 D. Question

The tax added to the value of the product is called _____ Tax.

A. Sales Tax

B. VAT

C. Excise Tax

D. Service Tax

Answer

It is called VAT

VAT means **value added tax**

Option B is the correct answer.

1 E. Question

If the S.P. of an article is Rs. 240 and the discount given on it is Rs. 28, then the M.P. is _____.

A.Rs. 212

B.Rs. 228

C.Rs. 268

D.Rs. 258

Answer

S.P = 240

Discount = 28

Marked price = Selling price + Discount.

= 240 + 28 = 268

Option C is the correct answer.

2. Question

The price marked on a book is Rs. 450. The shopkeeper gives 20% discount on it a in book exhibition. What is the Selling Price?

Answer

Marked price = 450

Discount = 20% of M.P

$= \frac{20}{100} \times 450 = 90$

Selling price = Marked Price – Discount

= 450 – 90 = 360

3. Question

A television set was sold for Rs. 5,760 after giving successive discounts of 10% and 20% respectively. What was the Marked Price?

Answer

Selling price of TV = 5,760

They have given successive discounts of 10% and 20% respectively

Selling price given is after the 2 discounts as mentioned.

Let x be the marked price of TV

So, selling price after 10% discount = $x - \frac{10}{100} x = 0.9x$

selling price after 20% discount = $0.9x - \frac{20}{100} (0.9x) = 0.9x (1-0.2)$

5,760 = (0.9) (0.8)x

$x = \frac{5760}{0.72}$

= 8,000

∴ 8,000 is the marked price of TV.

4. Question

Sekar bought a computer for Rs. 38,000 and a printer for Rs. 8,000. If the rate of sales tax is 7% for these items, find the price he has to pay to buy these two items.

Answer

Cost price of computer and printer are 38,000 and 8,000 respectively

∴ cost price is 38,000 + 8,000 = 46,000

Rate of sales tax is 7%

sales tax = (rate of sales tax) (cost of the product)

= 7% (46,000)

$= \frac{7}{100}(46{,}000) = 3{,}220$

∴ 3,220 is the sales tax amount for computer and printer

∴ Total cost to be paid for both computer and printer is

46,000 + 3,220 = 49,220

5. Question

The selling price with VAT, on a cooking range is Rs. 19,610. If the VAT is 6%, what is the original price of the cooking range?

Answer

Given

Selling price with VAT = 19,610

VAT is 6%

Let y be cost of cooking range

VAT amount = (VAT)(cost of cooking range)

= 6%(y)

$= \frac{6}{100}y = 0.06y$

Selling price = cost of the cooking range + VAT amount

19,610 = y + 0.06 y

19,610 = 1.06 y

$\frac{19{,}610}{1.06} = y$

y = 18,500

original price of the cooking range = 18,500

6. Question

Richard got a discount of 10% on the suit he bought. The marked price was Rs. 5,000 for the suit. If he had to pay sales tax of 10% on the price at which he bought, how much did he pay?

Answer

The marked price of the suit is 5,000

Discount offered is 10% of marked price

$= \frac{10}{100} \times 5{,}000 = 500$

Selling price = marked price - Discount

= 5,000 – 500 = 4,500

∴ He bought the suit for 4,500

He need to pay 10% as sales tax

Amount of sales tax = (rate of tax) (cost of the item)

= 10% (4,500)

$= \frac{10}{100} \times 4{,}500$

= 450

∴ He need to pay 450 as sales tax

Purchase price of the suit = 4,500 + 450 = 4,950

7. Question

The sales tax on a refrigerator at the rate of 9% is Rs. 1,170. Find the actual sale price.

Answer

Amount of sales tax is 1,170

Rate of sales tax is 9%

Let x be the cost price of refrigerator

Amount of sales tax = (Rate of sales tax) (cost price)

1,170 = 9% (x)

$1{,}170 = \frac{9}{100} x$

$\frac{1{,}170 \times 100}{9} = x$

x = 13,000

Actual cost price of refrigerator is 13,000

selling price = cost price + sales tax

= 13,000 + 1,170

= 14,170

8. Question

A trader marks his goods 40% above the cost price. He sells them at a discount of 5. What is his loss or gain percentage?

Answer

Let x be the cost price of the goods

Marked price is 40% above the cost price.

M.P = 40% of C.P + C.P

= 0.4x + x

= 1.4x

Discount = 5% of marked price

$= \frac{5}{100} \times 1.4x$

= (0.05) × (1.4x)

= 0.07x

Marked price = discount + selling price

1.4x = 0.07x + S.P

S.P = 1.4x – 0.07x

= 1.33x

Profit = S.P - C.P

= 1.33x – x

= 0.33 x

$\text{Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100\%$

$= \frac{0.33x}{x} \times 100\%$

= 33 %

9. Question

A T.V. with marked price Rs. 11,500 is sold at 10% discount. Due to festival season, the shop keeper allows a further discount of 5%. Find the net selling price of the T.V.

Answer

Marked price of TV is 11,500

He has given 2 discounts,

Discount of 10% = $\frac{10}{100} \times 11,500$

= 1,150

Selling price after first discount = marked price – discount of 10%

= 11,500 -1,150

= 10,350

Now 11,350 will becomes as the marked price

Discount of 5% due to festive season

Discount = $\frac{5}{100} \times 10,350$

= 0.05 × 10,350

= 517.5

Selling price after second discount = marked price – discount of 5%

= 10,350 – 517.5

= 9,832.5

Net selling price after two discounts is 9,832.5

10. Question

A person pays Rs. 2,800 for a cooler listed at Rs. 3,500. Find the discount percent offered.

Answer

Marked price = 3,500

Selling price = 2,800

Discount = marked price – selling price

= 3,500 – 2,800

= 700

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

= $\frac{700}{3,500} \times 100\%$

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

= 20%

20% is the discount offered.

11. Question

Deepa purchased 15 shirts at the rate of Rs. 1,200 each and sold them at a profit of 5%. If the customer has to pay sales tax at the rate of 4%, how much will one shirt cost to the customer?

Answer

Cost of each shirt = 1,200

No. of shirts = 15

Cost price of shirts = 15 × 1,200 = 18,000

Profit = 5%

= $\frac{5}{100}$ × 18,000

= 900

Total cost price = 18,000 + 900 = 18,900

Sales Tax = 4%

Amount of sales tax = (Rate of sales tax) (cost price)

= $\frac{4}{100}$ × 18,900

= 756

Total cost that customer has to pay = cost price + sales tax amount

= 18,900 + 756

= 19,656

Cost of 15 shirt that customer pay = 19,656

Cost of 1 shirt that customer has to pay = $\frac{19,656}{15}$ = 1,310.40

12. Question

Find the discount, discount percent, selling price and the marked price.

Sl. No	Items	M. P	Rate of Discount	Amount of Discount	S.P
(i)	Saree	Rs. 2,300	20%		
(ii)	Pen Set	Rs. 140			Rs. 105
(iii)	Dining table		20%		Rs. 16,000
(iv)	Washing machine	Rs. 14,500			Rs. 13,775
(v)	Crockery set	Rs. 3,224	12½%		

Answer

(i) Saree

Marked price = 2,300

Discount% = 20%

Discount = 20% of marked price

$= \frac{20}{100} \times 2{,}300 = 460$

Selling price = Marked price – Discount

= 2,300 - 460 = 1,840

(ii) Pen set

Marked price = 140

Selling price = 105

Discount = Marked price – Selling price

= 140 – 105 = 35

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

$= \frac{35}{140} \times 100\%$

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

(iii) Dining table

Discount% = 20%

Let M be the marked price

$\text{Discount} = \frac{20}{100} \times M = 0.2M$

Selling price = 16,000

Marked price = selling price + discount

M = 16,000 + 0.2M

0.8M = 16,000

$M = \frac{16,000}{0.8}$

= 20,000

Discount = Marked price - selling price

= 20,000 – 16,000

= 4,000

(iv) Washing machine

Marked price = 14,500

Selling price = 13,775

Discount = Marked price – Selling price

= 14,500 – 13,775 = 725

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

$= \frac{725}{14,500} \times 100\%$

$= \frac{100}{20} = 5\%$

(v) Crockery set

Marked price = 3,224

Discount% = 12.5%

Discount = 12.5% of marked price

$= \frac{12.5}{100} \times 3,224 = 403$

Selling price = Marked price – Discount

= 3,224 - 403 = 2,821

Exercise 1.4

1. Question

Find the Amount and Compound Interest in the following cases:

Sl. No	Principle in Rupees	Rate% per annum	Time in years
(i)	1000	5%	3
(ii)	4000	10%	2
(iii)	18,000	10%	21/2

Answer

Amount = $P\left(1 + \frac{r}{100}\right)^n$

P is the principle

r is the rate of interest

n is the time period in terms of years

(i) Principle = 1000

Rate of interest per annum = 5%

Time = 3 years

Amount = $1000\left(1 + \frac{5}{100}\right)^3$

= $1000\left(\frac{105}{100}\right)^3$

= 1,157.625

Compound Interest = Amount – Principle

= 1000 – 1,157.625

= 157.625

(ii) Principle = 4000

Rate of interest per annum = 10%

Time = 2 years

Amount = $4000\left(1 + \frac{10}{100}\right)^2$

= $4000\left(\frac{110}{100}\right)^2$

= 4,840

Compound Interest = Amount – Principle

= 4000 – 4,840

= 840

(iii) Principle = 18,000

Rate of interest per annum = 10%

Time = $2\frac{1}{2}$ years

We are going to find the compound interest year by year

For 1^{st} year

Amount = $18{,}000\left(1 + \frac{10}{100}\right)^1$

= $18{,}000\left(\frac{110}{100}\right)^1$

= 19,800

Now 19,800 become the principle amount

For 2^{nd} year

Amount = $19{,}800\left(1 + \frac{10}{100}\right)^1$

= $19{,}800\left(\frac{110}{100}\right)^1$

= 21,780

Amount = $P\left(1 + \frac{1}{2} \times \frac{r}{100}\right)^{2n}$

P is the principle

r is the rate of interest

n is the time period in terms of years

For half yearly

Amount = $18{,}000\left(1 + \frac{1}{2} \times \frac{10}{100}\right)^{2\times\frac{1}{2}}$

= $21{,}780\left(\frac{105}{100}\right)^1$

= 22,869

Compound Interest = Amount – Principle

= 22,869 – 18,000

= 4,869

2. Question

Sangeetha borrowed Rs. 8,000 from Alex for 2 years at 121/2% per annum. What interest did Sangeetha pay to Alex if the interest is compounded annually?

Answer

Rate of interest – 12.5% P.A

Principle – 8,000

Time – 2 years

Amount = $8{,}000\left(1+\frac{12.5}{100}\right)^2$

$= 8{,}000\left(\frac{9}{8}\right)^2$

= 10,125

Compound interest = Amount – principle

= 10,125 – 8,000 = 2,125

3. Question

Maria invested Rs. 80,000 in a business. She would be paid interest at 5% per annum compounded annually. Find

(i) the amount standing to her credit at the end of second year and (ii) the interest for the third year.

Answer

i. Principle = 80,000

Rate of interest per annum = 5%

Time = 2 years

Compound interest for 2 years

Amount = $80{,}000\left(1+\frac{5}{100}\right)^2$

$= 80{,}000\left(\frac{21}{20}\right)^2$

= 88,200

Compound interest = Amount – principle

= 80,000 - 88,200 = 8,200

8,200 will be credited at the end of 2 years

ii. Compound interest for 3 years

Amount = $80{,}000\left(1+\frac{5}{100}\right)^3$

$=80{,}000\left(\frac{21}{20}\right)^3$

= 92,610

Compound interest = Amount – principle

= 80,000 – 92,610 = 12,610

Compound interest for 3rd year

= compound interest of 3 years – compound interest of 2 years

= 12,610 - 8,200

= 4,410

Compound interest for the 3rd year is 4,410

4. Question

Find the compound interest on Rs. 24,000 compounded half - yearly for 11/2 years at the rate of 10% per annum.

Answer

Principle = 24,000

Rate of interest per annum = 10%

Time = 1.5 years

Amount = $24{,}000\left(1+\frac{1}{2}\times\frac{10}{100}\right)^{2\times\frac{3}{2}}$

$=24{,}000\left(\frac{21}{20}\right)^3$

= 27,783

Compound interest = Amount – principle

= 24,000 – 27,783

= 3,783

5. Question

Find the amount that Dravid would receive if he invests Rs. 8,192 for 18 months at 121/2% per annum, the interest being compounded half - yearly.

Answer

Principle = 8,192

Time = 18 months

Rate = 12.5 P.A

Amount = $8{,}192\left(1+\frac{1}{2}\times\frac{12.5}{100}\right)^{2\times\frac{3}{2}}$

= $8{,}192\left(\frac{17}{16}\right)^{3}$

= 9,826

6. Question

Find the compound interest on Rs. 15,625 for 9 months, at 16% per annum compounded quarterly.

Answer

Principle = 15,625

Rate of interest = 16%

Time = 9 months

Amount = $15{,}625\left(1+\frac{1}{4}\times\frac{12}{100}\right)^{4\times\frac{3}{4}}$

= $15{,}625\left(\frac{26}{24}\right)^{3}$

= 17,576

Compound interest = amount – principle

= 17,576 – 15,625

= 1,951

7. Question

Find the Principle that will yield a compound interest of Rs. 1,632 in 2 years at 4% rate of interest per annum.

Answer

Let x be the principle

Rate of interest = 4%

Time = 2 years

Compound interest = 1,632

Amount = $x\left(1+\frac{4}{100}\right)^2$

$= x\left(\frac{26}{25}\right)^2$

= 1.0816x

Compound interest = amount – principle

1,632 = 1.0816x – x

$\frac{1,632}{0.0816} = x$

X = 20,000

∴ principle is 20,000

8. Question

Vicky borrowed Rs. 26,400 from a bank to buy a scooter at the rate of 15% p.a. compounded yearly. What amount will he pay at the end of 2 years and 4 months to clear the loan?

Answer

Capital = 26,400

Rate of interest = 15%

Time = $2\frac{1}{3}$ years

Amount = $26,400\left(1+\frac{15}{100}\right)^2\left(1+\frac{1}{3}\times\frac{15}{100}\right)$

$= 26,400(1.15)^2 \times \left(\frac{21}{20}\right)$

= 36,659.7

9. Question

Arif took a loan of Rs. 80,000 from a bank. If the rate of interest is 10% p. a., find the difference in amounts he would be paying after 11/2 years if the interest is

(i) compounded annually and

(ii) compounded half - yearly.

Answer

Capital = 80,000

Rate of interest = 10%

Time = $1\frac{1}{2}$ years

i. Amount = $80{,}000\left(1+\frac{10}{100}\right)^{1}\left(1+\frac{1}{2}\times\frac{10}{100}\right)$

= $8(110)^{1}\times\left(\frac{210}{2}\right)$

= 92,400

ii. Amount = $80{,}000\left(1+\frac{1}{2}\times\frac{10}{100}\right)^{2\times\frac{3}{2}}$

= $80{,}000\left(\frac{21}{20}\right)^{3}$

= 92,610

10. Question

Find the difference between simple interest and compound interest on Rs. 2,400 at 2 years at 5% per annum compounded annually.

Answer

Principle – 2,400

Interest – 5%

Time – 2 years

Compound interest

Amount = $24{,}000\left(1+\frac{5}{100}\right)^{2}$

= $24{,}00\left(\frac{21}{20}\right)^{2}$

= 2,646

Compound interest = amount – principle

= 2,646 – 2,400 = 246

Simple interest = $\frac{\text{P.R.T}}{100}$

= $\frac{2{,}400\times 5\times 2}{100}$

= 240

The difference between compound and simple interest = 246 -240

= 6

11. Question

Find the difference between simple interest and compound interest on Rs. 6,400 for 2 years at 6 1/4% p. a. compounded annually.

Answer

Capital = 6,400

Rate of interest = 6.25%

Time = 2 years

Compound interest

Amount = $6{,}400\left(1+\frac{6.25}{100}\right)^2$

= $6{,}400\left(\frac{17}{16}\right)^2$

= 7,225

Compound interest = amount – principle

= 7,225 – 6,400 = 825

Simple interest = $\frac{P.R.T}{100}$

= $\frac{6{,}400\times 6.25\times 2}{100}$

= 800

The difference between compound and simple interest = 825 - 800

= 25

12. Question

The difference between C. I. and S. I. for 2 years on a sum of money lent at 5% p.a. is Rs. 5. Find the sum of money lent.

Answer

Let x be the sum of money lent

Time = 2 years

Interest = 5%

C.I – S.I = 5

Amount = $x\left(1+\frac{5}{100}\right)^2$

= $x\left(\frac{21}{20}\right)^2$

= 1.1025x

C.I = amount – principle

= 1.1025x – x

= 0.1025x

Simple interest = $\frac{P.R.T}{100}$

= $\frac{x \times 5 \times 2}{100}$

= 0.1x

C.I – S.I = 5

0.1025x – 0.1x = 5

0.0025x = 5

X = 2,000

∴ sum of money lent is 2,000

13. Question

Sujatha borrows Rs. 12,500 at 12% per annum for 3 years at simple interest and Radhika borrows the same amount for the same period at 10% per annum compounded annually. Who pays more interest and by how much?

Answer

sujatha

Principle = 12,500

Interest = 12%

Time = 3 years

Simple interest = $\frac{P.R.T}{100}$

= $\frac{12,500 \times 12 \times 3}{100}$

= 4,500

Radhika

Principle = 12,500

Interest = 10%

Time = 3 years

Amount = $12{,}500\left(1+\frac{10}{100}\right)^3$

= $12{,}500\left(\frac{11}{10}\right)^3$

= 16,637.5

Compound interest = Amount – principle

= 16,637.5 – 12,500

= 4,137.5

∴ Sujatha pays 362.5 more than Radhika

14. Question

What sum is invested for 11/2 years at the rate of 4% p.a. compounded half – yearly which amounts to Rs. 1,32,651?

Answer

Interest = 4%

Time = 1.5 years = $\frac{3}{2}$ years

Amount = 1,32,651

Sum = ?

Let x be the sum of amount

Amount = $x\left(1+\frac{1}{2}\times\frac{4}{100}\right)^{2\times\frac{3}{2}}$

1,32,651 = $x\left(\frac{51}{50}\right)^3$

1,32,651 = 1.061208x

x = $\frac{1{,}32{,}651}{1.061208}$

x = 1,25,000

∴ The principle amount is 1,25,000

15. Question

Gayathri invested a sum of Rs. 12,000 at 5% p.a. at compound interest. She received amount of Rs. 13,230 after 'n' years. Find the value of 'n'.

Answer

Sum of money invested = 12,000

Rate of interest = 5%

Amount = 13,230

Amount = $12{,}000\left(1 + \frac{5}{100}\right)^{n}$

13,230 = $12{,}000\left(\frac{21}{20}\right)^{n}$

1.1025 = $\left(\frac{21}{20}\right)^{n}$

Taking log on bo21th sides

$\log 1.1025 = n \log \frac{21}{20}$

$\frac{0.42378}{0.21189} = n$

N = 2 years

16. Question

At what rate percent compound interest per annum will Rs. 640 amounts to Rs. 774.40 in 2 years?

Answer

Principle = 640

Amount = 774.40

Time = 2 years

Interest rate = ?

Let interest rate be x

Amount = $640\left(1 + \frac{x}{100}\right)^{2}$

774.40 = $640\left(\frac{100 + x}{100}\right)^{2}$

$$\sqrt{\frac{774.40}{640}} \times 100 - 100 = x$$

X = 10

∴ interest rate is 10%

17. Question

Find the rate percent per annum, if Rs. 2,000 amounts to Rs. 2,315.25 in an year and a half, interest being compounded half-yearly.

Answer

Principle = 2,000

Amount = 2,315.25

Time = 1.5 year

Interest rate = ?

Let interest rate be x

$$\text{Amount} = 2{,}000\left(1 + \frac{\frac{x}{2}}{100}\right)^{2 \times \frac{3}{2}}$$

$$2{,}315.25 = 2{,}000\left(\frac{200 + x}{200}\right)^{3}$$

$$\sqrt[3]{\frac{2{,}315.25}{2{,}000}} \times 200 - 200 = x$$

X = 10

∴ interest rate is 10%

Exercise 1.5

1. Question

The number of students enrolled in a school is 2000. If the enrolment increases by 5% every year, how many students will be there after two years?

Answer

Number of students in school = 2,000

Rate of increasing = 5%

For 1^{st} year

No. of students enrolled in the 1^{st} year = 5% of 2,000

$= \frac{5}{100} \times 2{,}000$

= 100

After 1-year no. of students in the school is 2100

For 2^{nd} years

No. of students enrolled in the 2^{nd} year = 5% of 2,100

$= \frac{5}{100} \times 2{,}100$

= 105

After 2-year no. of students in the school is 2205

2. Question

A car which costs Rs. 3,50,000 depreciates by 10% every year. What will be the worth of the car after three years?

Answer

Current worth of car(P) = 3,50,000

Rate of depreciation(R) = 10%

No. of years(n) = 3

The worth of car after 3 years = $p\left(1-\frac{R}{100}\right)^n$

$= 3{,}50{,}000\left(1-\frac{10}{100}\right)^3$

= 2,55,150

The worth of car after 3 years is 2,55,150

3. Question

A motorcycle was bought at Rs. 50,000. The value depreciated at the rate of 8% per annum. Find the value after one year.

Answer

Motor cycle price (P) = 50,000

Rate of depreciation(R) = 8%

No. of years(n) = 1

The worth of motor cycle after 1 year = $p\left(1-\frac{R}{100}\right)^n$

$= 50{,}000\left(1-\frac{8}{100}\right)^{1}$

= 500 (92)

= 46,000

The worth of motor cycle after 1 year is 46,000

4. Question

In a Laboratory, the count of bacteria in a certain experiment was increasing at the rate of 2.5% per hour. Find the bacteria at the end of 2 hours if the count was initially 5,06,000.

Answer

Initial count (P) = 5,06,000

Rate of increase (R) = 2.5% per hour

No. of hours(n) = 2

The count of bacteria after 2 hours = $p\left(1+\frac{R}{100}\right)^{n}$

$= 5{,}06{,}000\left(1+\frac{2.5}{100}\right)^{2}$

$= 5060 \times 102.5^{2}$

= 5,31,61,625

5. Question

From a village people started migrating to nearby cities due to unemployment problem. The population of the village two years ago was 6,000. The migration is taking place at the rate of 5% per annum. Find the present population.

Answer

Population before 2 years (P) = 6,000

Rate of migration (R) = 5%

No. of years (n) = 2

Present population = $p\left(1-\frac{R}{100}\right)^{n}$

$= 6{,}000 \times \left(1-\frac{5}{100}\right)^{2}$

$= 0.6\ (95)^{2}$

= 5,415

Present population in the village is 5,415

6. Question

The present value of an oil engine is Rs. 14,580. What was the worth of the engine 3 years before if the value depreciates at the rate of 10% every year?

Answer

present value of an oil engine = 14,580.

Rate of depreciation(R) = 10%

No. of years(n) = 3

Value of engine oil before 3 years (P) = ?

present value of an oil engine = $p\left(1-\frac{R}{100}\right)^n$

$14,580 = p\left(1-\frac{R}{100}\right)^n$

$14,580 = p\left(1-\frac{10}{100}\right)^3$

$P = \frac{14,580}{0.9^3}$

P = 20,000

Value of engine oil before 3 years (P) is 20,000

7. Question

The population of a village increases by 9% every year which is due to the job opportunities available in that village. If the present population of the village is11,881, what was the population two years ago?

Answer

Current population of village = 11,881

Rate of increase (R) = 9%

No. years (n) = 2

Population of the village before 2 years (P) = ?

Current population of village = $p\left(1+\frac{R}{100}\right)^n$

$11,881 = p\left(1+\frac{9}{100}\right)^2$

$P = \frac{11,881}{1.1881}$

P = 10,000

Population of the village before 2 years (P) = 10,000

Exercise 1.6

1. Question

Ponmani makes a fixed deposit of Rs. 25,000 in a bank for 2 years. If the rate of interest is 4% per annum, find the maturity value.

Answer

Total deposit (p) = 25,000

No. of years (N) = 2 years

Rate of interest (R) = 4% per annum

Interest = $p \times N \times \frac{R}{100}$

$= 25,000 \times 2 \times \frac{4}{100}$

= 2,000

Maturity value = Total deposit + Interest

= 25,000 + 2,000

= 27,000

2. Question

Deva makes a fixed deposit of Rs. 75,000 in a bank for 3 years. If the rate of interest is 5% per annum, find the maturity value.

Answer

Total deposit (p) = 75,000

No. of years (N) = 3 years

Rate of interest (R) = 5% per annum

Interest = $p \times N \times \frac{R}{100}$

$= 75,000 \times 3 \times \frac{5}{100}$

= 11,250

Maturity value = Total deposit + Interest

= 75,000 + 11,250

= 86,250

3. Question

Imran deposits Rs. 400 per month in a post office as R.D. for 2 years. If the rate of interest is 12%, find the amount he will receive at the end of 2 years.

Answer

Amount deposited (P) = 400/ month

No. of years (n) = 2 years = 2 × 12 = 24 months

Rate of interest (R) = 12%

Total deposit made = P × n

= 400 × 24 = 9,600

Period for recurring deposit, (N) = $\frac{1}{12}\left(\frac{n(n+1)}{2}\right)$

= $\frac{1}{12}\left(\frac{24\,(24+1)}{2}\right)$ = 25 years

Interest = p× N × $\frac{R}{100}$

= 400 × 25 × $\frac{12}{100}$

= 1,200

Maturity amount = P × n + p× N × $\frac{R}{100}$

= 9,600 + 1,200

= 10,800

He will receive 10,800 at the end of 2 years

4. Question

The cost of a microwave oven is Rs. 6,000. Poorani wants to buy it in 5 instalments. If the company offers it at the rate of 10% p. a. Simple Interest, find the E.M.I. and the total amount paid by her.

Answer

Cost of microwave (P) = 6,000

Rate of interest (R) = 10%

No. of installments (N) = 5 months = $\frac{5}{12}$ years

Interest = p× N × $\frac{R}{100}$

= 6,000 ×$\frac{5}{12}$ × $\frac{10}{100}$

= 250

Total amount to be paid for microwave oven = 6000 + 250

= 6250

Amount to be paid on every installment = $\frac{6250}{5}$ = 1,250

5. Question

The cost price of a refrigerator is Rs. 16,800. Ranjith wants to buy the refrigerator at 0% finance scheme paying 3 E.M.I. in advance. A processing fee of 3% is also collected from Ranjith. Find the E.M.I. and the total amount paid by him for a period of 24 months.

Answer

cost price of a refrigerator (P) Rs. 16,800

No. of months (N) = 24

Interest = 0%

Processing Fess = 3%

E.M.I = $\frac{\text{Amount + Interest}}{\text{No.of months}}$

= $\frac{16,800 + 0}{24}$

= 700

Given that 3 EMI are paid in advance

= 700 × 3

= 2,100

Processing fess is 3% of cost price

= $\frac{3}{100}$ × 16,800 = 504

Total amount to be paid = Initial payment + processing fees + cost

price

= 2,100 + 504 + 16,800

= 19,404

6. Question

The cost of a dining table is Rs. 8,400. Venkat wants to buy it in 10 instalments. If the company offers it for a S.I. of 5% p. a., find the E.M.I. and the total amount paid by him.

Answer

Cost price of dining table = 8,400

No. of installments = 10

So, n = $\frac{10}{12}$ years

Rate of Interest = 5%

Interest = p× N × $\frac{R}{100}$

= $\frac{5}{100}$ × 8,400 × $\frac{10}{12}$

= 350

Total amount to be paid = interest + cost price

= 350 + 8,400

= 8,750

E.M.I = $\frac{\text{Total amount}}{\text{No.of installments}}$

= $\frac{8,750}{10}$

= 875

Exercise 1.7

1. Question

Twelve carpenters working 10 hours a day complete a furniture work in 18 days. How long would it take for 15 carpenters working for 6 hours per day to complete the same piece of work?

Answer

No. of carpenter	No. of hours in a day	No. of days
12	10	18
15	6	x

Let x be the no. of days to be found out

Step :1

Considering the carpenter and the no. of days

The multiplying factor = $\frac{12}{15}$

Step :2

Considering the no. of hours in a day and the no. of days

The multiplying factor = $\frac{10}{6}$

$x = \frac{12}{15} \times \frac{10}{6} \times 18$

x = 24 days

2. Question

Eighty machines can produce 4,800 identical mobiles in 6 hours. How many mobiles can one machine produce in one hour? How many mobiles would 25 machines produce in 5 hours?

Answer

No. of machines	No. of hours	No. of mobiles
80	6	4800
1	1	x
25	5	y

In 6 hours, 80 machines can produce 4,800 mobiles

In 1 hour, 1 machine can produce $\frac{4,800}{6 \times 80}$

= 10 mobiles

In 5 hours, 25 machines can produce = 10 × 5 × 25

= 1,250 mobiles

3. Question

If 14 compositors can compose 70 pages of a book in 5 hours, how many compositors will compose 100 pages of this book in 10 hours?

Answer

No. of compositors	No. of pages	No. of hours
14	70	5
x	100	10

Step :1

Considering the No. of compositors and no. of pages

The multiplying factors $\frac{100}{70}$

Step :2

Considering the No. of compositors and no. of hours

The multiplying factors $\frac{5}{10}$

So, the No. of compositors required

$x = \frac{100}{70} \times \frac{5}{10} \times 14$

$x = 10$

4. Question

If 2,400 sq.m. of land can be tilled by 12 workers in 10 days, how many workers are needed to till 5,400 sq.m. of land in 18 days?

Answer

Area of land (Sq.M)	No. of workers	No. of days
2,400	12	10
5,400	x	18

Considering the Area of land and no. of workers

The multiplying factors $\frac{5,400}{2,400}$

Considering the No. of days and no. of workers

The multiplying factors $\frac{10}{18}$

So, the No. of compositors required

$x = \frac{5,400}{2,400} \times \frac{10}{18} \times 12$

$x = 15$

5. Question

Working 4 hours daily, Swati can embroid 5 sarees in 18 days. How many days will it take for her to embroid 10 sarees working 6 hours daily?

Answer

Working 4 hours daily, Swati can embroid 5 sarees in 18 days

She works 4 hours in a day (here, 1 day = 4 hour)

Swati can embroid 5 sarees in 18 × 4 hour

= 72 hours

Swati can embroid 1 saree in $\frac{72}{5}$ hours

= 14.4 hours

Time taken for embroid is 14.4 hrs/saree

Time taken for 10 sarees = 14.4hrs/saree × 10 saree

= 144 hrs

If she work 6 hours a day (here, 1 day = 6 hours)

Time taken for 10 sarees = $144 \times \frac{1}{6}$ days

= 24 days

6. Question

A sum of Rs. 2,500 deposited in a bank gives an interest of Rs. 100 in 6 months. What will be the interest on Rs. 3,200 for 9 months at the same rate of interest?

Answer

Sum of amount	No. of months	Interest Amount
2,500	6	100
3,200	9	x

Considering the Sum of Amount and Interest Amount

The multiplying factors $\frac{3,200}{2,500}$

Considering the No. of month and no. of workers

The multiplying factors $\frac{9}{6}$

So, the No. of compositors required

$x = \frac{3,200}{2,500} \times \frac{9}{6} \times 100$

x = 192

Exercise 1.8

1. Question

A man can complete a work in 4 days, whereas a woman can complete it in only12 days. If they work together, in how many days, can the work be

completed?

Answer

A man can complete a work in 4 days

Man's 1-day work = $\frac{1}{4}$

Woman can complete a work in 12 days

Woman's 1-day work = $\frac{1}{12}$

1-day work of both = $\frac{1}{4} + \frac{1}{12} = \frac{1}{3}$

By working together, they can complete a work in 3 days

2. Question

Two boys can finish a work in 10 days when they work together. The first boy can do it alone in 15 days. Find in how many days will the second boy do it all himself?

Answer

If two boys work together they can finish a work in 10 days

Let the two boys be x & y

x & y's 1-day work = $\frac{1}{10}$

$x + y = \frac{1}{10}$ ..eq (1)

first boy (x) can do it in 15 days

x's 1-day work = $\frac{1}{15}$

$x = \frac{1}{15}$

substituting the value of x in **eq(1)**

$x + y = \frac{1}{10}$

$\frac{1}{15} + y = \frac{1}{10}$

$y = \frac{1}{30}$

y's 1-day work = $\frac{1}{30}$

so, second boy (y) can do a work in 30 days

3. Question

Three men A, B and C can complete a job in 8, 12 and 16 days respectively.

A and B work together for 3 days; then B leaves and C joins. In how many days, can A and C finish the work?

Answer

A, B and C can complete a job in 8, 12 and 16 days respectively.

<u>1-Day work:</u>

A's = $\frac{1}{8}$

B's = $\frac{1}{12}$

C's = $\frac{1}{16}$

A and B's 1-day work = $\frac{1}{8} + \frac{1}{12} = \frac{5}{24}$

A and B work together for 3 days

= $3 \times \frac{5}{24} = \frac{5}{8}$

The remaining work after 3 days = $1 - \frac{5}{8} = \frac{3}{8}$

The remaining work will be done by A & C together

Work done by A & C = $\frac{1}{8} + \frac{1}{16} = \frac{3}{16}$

By doing $\frac{3}{16}$ potion of the work in a day they can complete remaining work ($\frac{3}{8}$) in 2 days

4. Question

A tap A can fill a drum in 10 minutes. A second tap B can fill in 20 minutes. A third tap C can empty in 15 minutes. If initially the drum is empty, find when it will be full if all taps are opened together?

Answer

Time taken by A = 10 min

Work done by A in 1 min = $\frac{1}{10}$

Time taken by B = 20 min

Work done by B in 1 min = $\frac{1}{20}$

Time taken by C = 15 min

Work done by C in 1 min = $\frac{1}{15}$

Work done by all three A, B & C in 1 min = $\frac{1}{10} + \frac{1}{20} - \frac{1}{15} = \frac{1}{12}$

Time taken by all three A, B & C in = 12 min

5. Question

A can finish a job in 20 days and B can complete it in 30 days. They work together and finish the job. If Rs. 600 is paid as wages, find the share of each.

Answer

Time taken by A = 20 days

Work done by A in 1 day = $\frac{1}{20}$

Time taken by B = 30 days

Work done by B in 1 day = $\frac{1}{30}$

Wages = 600

Ratio of work done by A & B in 1-day = $\frac{1}{20} : \frac{1}{30}$ = 3:2

So. The ratio of the wages will be 3:2

3x + 2x = 600

5x = 600

X = 120

A's wage = 3x = 3 × 120 = 360

B's wage = 2x = 2 × 120 = 240

6. Question

A, B and C can do a work in 12, 24 and 8 days respectively. They all work for one day. Then C leaves the group. In how many days will A and B complete the rest of the work?

Answer

A, B and C can do a work in 12, 24 and 8 days respectively.

A, B and C's 1-day work will be $\frac{1}{12}, \frac{1}{24}, \frac{1}{8}$ respectively

1-day's work of all of them = $\frac{1}{12}+\frac{1}{24}+\frac{1}{8}=\frac{1}{4}$

Remaining portion of work = 1- $\frac{1}{4}=\frac{3}{4}$

After that C leaves the group. So, the rest of the work will be completed by A & B only

A & B's 1-day's work = $\frac{1}{12}+\frac{1}{24}=\frac{1}{8}$

No. of day required = $\frac{\text{remainig portion of work}}{1-\text{day's work}}=\frac{\left(\frac{3}{4}\right)}{\left(\frac{1}{8}\right)}$ = 6 days

7. Question

A tap can fill a tank in 15 minutes. Another tap can empty it in 20 minutes. Initially the tank is empty. If both the taps start functioning, when will the tank become full?

Answer

Time taken by A = 15 min

Work done by A in 1 min = $\frac{1}{20}$

Time taken by B = 30 min

Work done by B in 1 min = $\frac{1}{30}$

Work done by all three A, B in 1 min = $\frac{1}{20}-\frac{1}{30}=\frac{1}{60}$

(∵ B empties the tank we use negative there)

Time taken to fill to the tank is 60 min