9. Commercial arithmetic

Exercise 9.1

1. Question

In a school, 30% of students play chess, 60% play carrom and the rest play other games. If the total number of students in the school is 900, find the exact number of students who play each game.

Answer

Total number of students = 900

No. of students who play chess = 30% of total no. of students

= 30% x 900

$$= \frac{30}{100} \times 900$$

= 270

No. of students who play carrom = 30% of total no. of students

= 60% × 900

$$= \frac{60}{100} \times 900$$

= 540

No. of students who play other games = 100%-(60%+30%) of

total students

= 10% x 900

$$= \frac{10}{100} \times 900$$

=90

2. Question

In a school function ₹ 360 remained after spending 82% of the money. How much money was there in the beginning? Verify your answer.

Answer

Let the money in beginning was x

Percentage (%) of money spent = 82%

⇒ Percentage (%) of money remaining = 18%

Amount remaining = 360

⇒ 18% of x = 360

$$\Rightarrow \frac{18}{100} \times x = 360$$

$$\Rightarrow x = 360 \times \frac{100}{18}$$

$$\Rightarrow x = 2000$$

Verification: 82% of 2000 $= \frac{82}{100} \times 2000$

= 1640

And 2000-1640 = Rs.360,

which was our remaining 18 %

3. Question

Akshay's income is 20% less than that of Ajay. What percent is Ajay's income more than that of Akshay?

Answer

Let the income of ajay be x

Aksahy's income = (100-20)% of Ajay's income

= 80% of x

$$= \frac{80}{100} \times x$$

= 0.80x

Then, percentage of = $\frac{\text{Ajay's income} - \text{akshay's income}}{\text{Akshay's income}} \times 100\ \%$

ajay's income **more than that** of akshay

$$= \frac{x - 0.80x}{0.80x} \times 100\ \%$$

$$= \frac{0.20x}{0.80x} \times 100\ \%$$

= 25%

è **Tip:** For better understanding, you can imagine Ajay's income be 100.

Then akshay's income would become 80. So % of ajay's income greater than that of akshay will be 100-80 = 20

20 is 25% of 80 (akshay's income)

Don't write this in your exam.

4. Question

A daily wage employee spends 84% of his weekly earning. If he saves ₹ 384, find his weekly earning.

Answer

Let the weekly earning be x

Percentage (%) of money spent = 84%

⇒ Percentage (%) of money remaining = 16%

Amount saved =384

⇒ 16% of x = 384

$$\Rightarrow \frac{16}{100} \times x = 384$$

$$\Rightarrow x = 384 \times \frac{100}{16}$$

$$\Rightarrow x = 2400$$

So, weekly earning is 2400

5. Question

A factory announces a bonus of 10% to its employees. If an employee gets ₹ 10,780, find his actual salary.

Answer

Let the salary be x

Percentage (%) of bonus = 10%

⇒ Amount of bonus = 10% of x

Total salary received = 10% of x + x = 10,780

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

= 1.1 x

⇒ 1.1 x = 10,780

X= 9800

So, salary is 9800

Exercise 9.2

1. Question

Sonu bought a bicycle for ₹ 3,750 and spent ₹ 250 on its repairs. He sold it for ₹ 4,400. Find his loss or profit percentage.

Answer

CP of cycle = ₹ 3,750

Overhead expenses = ₹ 250

Effective CP = CP of cycle + Overhead expenses

= Rs. 4,000

SP of cycle = Rs. 4,400

Profit = SP – Effective CP

= 4400-4000

= 400

$$\text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100\ \%$$

$$= \frac{400}{4000} \times 100\ \%$$

= 10%

So, Profit is Rs.400 & profit % = 10%

2. Question

A shopkeeper purchases an article for ₹ 3,500 and pays transport charge of ₹ 100. He incurred a loss of 12% in selling this. Find the selling price of the article.

Answer

CP of article = ₹ 3500

Overhead expenses = ₹ 100

Effective CP = CP + Overhead expenses

= Rs. 3,600

Loss % = $\frac{\text{loss}}{\text{CP}} \times 100\ \%$ = 12%

$\Rightarrow \frac{\text{loss}}{3600} \times 100 = 12$

Loss = 12 x 36

= Rs. 432

SP = CP- Loss

= 3600-432

= Rs. 3168

3. Question

By selling a watch for ₹ 720, Ravi loses 10%. At what price should he sell it, in order to gain 15%?

Answer

Let the CP of watch be x

SP of watch = ₹ 720

Loss = 10% of CP

Also, Loss = CP – SP

⇒ 10% of x = x – 720

$\Rightarrow \frac{10}{100} \times x = x - 720$

$\Rightarrow \frac{x}{10} = x - 720$

$\Rightarrow x - \frac{x}{10} = 720$

$\Rightarrow \frac{10x - x}{10} = 720$

$\Rightarrow 9x = 7200$

$\Rightarrow x = 800$

∴ CP of watch is Rs.800

Now for profit of 15%

Profit % $= \frac{\text{Profit}}{\text{CP}} \times 100\ \%$

$\Rightarrow 15\% = \frac{\text{Profit}}{800} \times 100\ \%$

$\Rightarrow \frac{15 \times 800}{100} = \text{Profit}$

$\Rightarrow$ Profit = 120

$\Rightarrow$ SP of watch = CP + profit

= 800+120

= 920

$\therefore$ Ravi should sell watch at Rs.920 to gain 15%.

4. Question

Hari bought two fans for ₹ 2,400 each. He sold one at a loss of 10% and the other at a profit of 15%. Find the selling price of each fan and find also the total profit or loss.

Answer

CP of a fan = ₹ 2,400

He sold 1st fan at Loss of 10%

SP of 1st fan = CP – 10% of CP

$\Rightarrow \text{SP} = 2400 - \frac{10}{100} \times 2400$

$\Rightarrow \text{SP} = 2400 - 240$

$\Rightarrow$ SP of 1st fan = 2160

He sold another fan at profit of 15%

SP of 2nd fan = CP + 15% of CP

$\Rightarrow \text{SP} = 2400 + \frac{15}{100} \times 2400$

$\Rightarrow \text{SP} = 2400 + 360$

$\Rightarrow$ SP of 2nd fan = 2760

Overall Profit/Loss = SP of both fans – CP of both fans

= (2760+2160)-(2400+2400)

= 120

∴ He made an overall profit of Rs.120

5. Question

A storekeeper sells a book at 15% gain. Had he sold it for 18 more, he would have gained 18%. Find the cost price of the book.

Answer

Let the CP of book be x

1st SP = SP at Profit of 15%.

$$= x + \frac{15}{100}x$$

$$= \frac{115x}{100}$$

= 0.15x

2nd SP = SP at Profit of 18%

$$= x + \frac{18}{100}x$$

$$= \frac{118x}{100}$$

= 0.18x

Also, 2nd SP = 1st SP + 18

⇒ 0.18x = 0.15x + 18

⇒ 0.03x = 18

$$\Rightarrow x = \frac{18}{0.03}$$

⇒ x = 600

∴ CP of book is Rs.600

6. Question

The cost price of 12 pens is equal to selling price of 10 pens. Find the profit percentage.

Answer

Let the CP of pen be x

CP of 12 pens = 12x

SP of 10 pens = 12x

SP of 1 pen $= \frac{12x}{10}$

= 1.2x

Profit = SP – CP

= 1.2x - x

= 0.2x

Profit % $= \frac{\text{Profit}}{\text{CP}} \times 100\ \%$

$\Rightarrow \text{Profit}\% = \frac{0.2x}{x} \times 100\ \%$

$\Rightarrow \text{Profit}\% = 20\%$

∴ Profit percentage of pen is 20%.

Exercise 9.3

1. Question

An article marked ₹ 800 is sold for ₹ 704. Find the discount and discount percent.

Answer

Marked price = 800

Selling price = 704

Discount = 800-704

= 96

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

$\Rightarrow \text{Discount}\ \% = \frac{96}{800} \times 100\ \%$

$\Rightarrow \text{Discount}\ \% = 12\%$

∴ Discount is Rs.96 and discount percentage 12%.

2. Question

A dress is sold at ₹ 550 after allowing a discount of 12%. Find its marked price.

Answer

Let Marked price be x

Selling price = 550

Discount = x-550

= 96

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

$$\Rightarrow 12 = \frac{x - 550}{x} \times 100$$

$$\Rightarrow 12x = 100x - 55000$$

$$\Rightarrow 88x = 55000$$

$$\Rightarrow x = \frac{55000}{88}$$

$$\Rightarrow x = 625$$

∴ Marked price is Rs.625.

3. Question

A shopkeeper buys a suit piece for ₹ 1,400 and marks it 60% above the cost price. He allows a discount of 15% on it. Find the marked price of the suit piece and also the discount given.

Answer

CP of suit = 1,400

Marked price = 60% of CP + CP

$$= \frac{60}{100} \times 1400 + 1400$$

= 2240

Discount % = 15%

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

$$\Rightarrow 15 = \frac{\text{DIscount}}{2240} \times 100$$

$$\Rightarrow \text{Discount} = \frac{2240 \times 15}{100}$$

⇒ Discount = Rs.336

∴ Marked price is Rs.2240, discount given is Rs.336 and marked price after discount Rs.1904.

4. Question

A dealer marks his goods 40% above the cost price and allows a discount of 10%. Find the profit percent.

Answer

Let CP of goods be x

Marked price = 40% of CP + CP

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

= 1.40x

Discount % = 10%

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

$\Rightarrow 10 = \frac{\text{DIscount}}{1.40x} \times 100$

$\Rightarrow \text{Discount} = \frac{14x}{100}$

⇒ Discount = 0.14x

SP = Marked price - Discount

= 1.40x - 0.14x

= 1.26x

Profit = SP – CP

= 1.26x-x

= 0.26x

$\text{Profit \%} = \frac{0.26x}{x} \times 100\ \%$

$\Rightarrow \text{Profit\%} = 0.26 \times 100\ \%$

$\Rightarrow \text{Profit\%} = 26\%$

∴ Profit % is 26%.

5. Question

A dealer is selling an article at a discount of 15%. Find:

(i) the selling price if the marked price is ₹ 500;

(ii) the cost price if he makes 25% profit.

Answer

(i) Marked price = 500

Discount % = 15%

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

$$\Rightarrow 15 = \frac{\text{DIscount}}{500} \times 100$$

$$\Rightarrow \text{Discount} = 75$$

SP = 500 - 75

= 425

∴ Selling price is Rs.425

(ii) let the CP be x

$$\text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100\ \%$$

$$\Rightarrow 25 = \frac{\text{Profit}}{\text{x}} \times 100$$

$$\Rightarrow \text{Profit} = 0.25\text{x}$$

Profit = SP – CP

0.25x = 425 – x

1.25x = 425

$$\text{x} = \frac{425}{1.25}$$

x = 340

∴ Cost price is Rs.340.

Exercise 9.4

1. Question

Sindhu sells her scooty for ₹ 28,000 through a broker. The rate of brokerage is 2.5 %. Find the commission that the agent gets and the net amount Sindhu gets.

Answer

Let net amount sindhu gets be x

Brokerage rate = 2.5%

Brokerage charges = $\frac{2.5}{100} \times x$

Selling price of scooty = 28,000

Selling Price = amount sindhu gets + brokerage charges

= x+0.025x

1.025x = 28,000

x = $\frac{28000}{1.025}$

x = 27,300 (rounded off, actual value 27317.07)

∴ Money sindhu gets = Rs.27,300

The commission that the agent gets = 28000-27300

= Rs.700

2. Question

A share agent sells 2000 shares at ₹ 45 each and gets the commission at the rate of 1.5%. Find the amount the agent gets.

Answer

Price of each share = Rs.45

Commission rate per share = 1.5%

Commission charges per share = $\frac{1.5}{100} \times 45$

= Rs 0.675

Total commission = 2000 x per share commission

= 2000 x 0.675

= Rs1350

∴ The commission agent gets = Rs1350

3. Question

A person insures ₹ 26,000 through an insurance agent. If the agent gets ₹ 650 as the commission, find the rate of commission.

Answer

Amount person insures = Rs.26,000

Amount agent gets (Commission) = Rs.650

% of commission = $\frac{650}{26000} \times 100$

= 2.5%

∴ Percentage of commission agent gets = 2.5%

4. Question

A selling agent gets 10,200 in a month. This includes his monthly salary of ₹ 6000 and 6% commission for the sales. Find the value of goods he sold.

Answer

Salary = Rs.6000

Total money he got = Rs.10,200

Money as commission for sales = 10200-6000

= 4200

Since rate of commission is 6%. So, money he got as commission is 6% the value of goods he sold.

⇒ 6% of value of goods = 4200

⇒ value of goods $= 4200 \times \frac{100}{6}$

⇒ value of goods = 70000

∴ Value of goods he sold is Rs70000

Exercise 9.5

1. Question

Find the simple interest on ₹ 2,500 for 4 years at $6\frac{1}{4}$ % per annum.

Answer

Simple interest (SI) $= \frac{P \times R \times T}{100}$

Here,

Principal amount (P) = Rs.2500

Time (T) = 4 years

Rate of interest = $6\frac{1}{4}\%$

= 6.25 %

SI = $\frac{2500\times4\times6.25}{100}$

= 625

∴ Simple interest = Rs625

2. Question

Find the simple interest on ₹ 3,500 at the rate of $2\frac{1}{2}$ % per annum for 165 days.

Answer

Simple interest (SI) = $\frac{P\times R\times T}{100}$

Here,

Principal amount (P) = Rs.3500

Time (T) = 165 days = $\frac{165}{365}$ years

Rate of interest = $2\frac{1}{2}\%$

= 2.5 %

SI = $\frac{3500\times\frac{165}{365}\times2.5}{100}$

= 39.55

∴ Simple interest = Rs39.55

3. Question

In what period will ₹ 5,200 amounts to ₹ 7,384 at 12% per annum simple interest?

Answer

Simple interest (SI) = $\frac{P\times R\times T}{100}$

Here,

SI = 7384-5200

= 2184

Principal amount (P) = Rs.5200

Rate of interest = 12%

Time (T) = $\frac{SI \times 100}{P \times R}$

$= \frac{2184 \times 100}{5200 \times 12}$ years

= 3.5 years

∴ Time period = 3.5 years

4. Question

Ramya borrowed a loan from a bank for buying a computer. After 4 years she paid ₹ 26,640 and settled the accounts. If the rate of interest is 12% per annum, what was the sum she borrowed?

Answer

Simple interest (SI) $= \frac{P \times R \times T}{100}$

Here,

Loan amount borrowed be P

SI = 26640-P

= 2184

Rate of interest = 12%

Time (T) = 4

Loan amount P = $\frac{SI \times 100}{R \times t}$

$\Rightarrow P = \frac{(26640 - P) \times 100}{4 \times 12}$

$\Rightarrow 48P = 2664000 - 100P$

$\Rightarrow 148P = 2664000$

$\Rightarrow P = \frac{2664000}{148}$

$\Rightarrow P = 18000$

∴ Amount Ramaya borrowed =Rs 18,000

5. Question

A sum of money triples itself in 8 years. Find the rate of interest.

Answer

Simple interest (SI) $= \frac{P \times R \times T}{100}$

Here,

Let Principal amount (P) = x

Time (T) = 8 years

Amount at end of 8 years = 3x

SI = 3x-x

= 2x

Rate (R) = $\frac{SI \times 100}{P \times T}$

$= \frac{2x \times 100}{x \times 8}$

= 25%

∴ Rate of interest = 25%.

Exercise 9.6

1. Question

A person purchases the following items from a mall for which the sales tax is mentioned against:

(a) Stationery materials for ₹ 250 and sales tax of 4% there on;

(b) Electronic goods worth ₹ 2,580 and sales tax of 10% there on;

(c) Groceries worth ₹ 1,200 on which sales tax of 3% is levied;

(d) Medicines worth ₹ 200 with sales tax of 6%. Find the bill amount for each item.

Answer

(a) Price of goods = 250

Tax = 4%

Tax amount = $\frac{4}{100} \times 250$

= 10

Bill amount = Price of goods + tax amount

= 250+10

= 260

(b) Price of goods = 2580

Tax = 10%

Tax amount = $\frac{10}{100} \times 2580$

= 258

Bill amount = Price of goods + tax amount

= 2580+258

= 2838

(c) Price of goods = 1200

Tax = 3%

Tax amount = $\frac{3}{100} \times 1200$

= 36

Bill amount = Price of goods + tax amount

= 1200+36

= 1236

(d) Price of goods = 200

Tax = 6%

Tax amount = $\frac{6}{100} \times 200$

= 12

Bill amount = Price of goods + tax amount

= 200+12

= 212

2. Question

A person buys electronic goods worth ₹ 10,000 for which the sales tax is 4% and other material worth ₹ 15,000 for which the sales tax is 6%. He

manufactures a gadget using all these and sells it at 15% profit. What is his selling price?

Answer

Price of electronic goods = 10,000

Tax = 4%

Tax amount = $\frac{4}{100} \times 10000$

= 400

Net amount of = Price of goods + tax amount

electronic goods

= 10000+400

= 10400

Price of other materials = 15,000

Tax = 6%

Tax amount = $\frac{6}{100} \times 15000$

= 900

Net amount of = Price of goods + tax amount

Other materials

= 15000+900

= 15900

Net amount for input = 10400+15900

material of gadget

= 26300

$\text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100\ \%$

$\Rightarrow 15 = \frac{\text{Profit}}{26300} \times 100$

$\Rightarrow \text{Profit} = 26300 \times \frac{15}{100}$

$\Rightarrow \text{Profit} = 3945$

∴ SP = CP + profit

= 26300+3945

= Rs30245

3. Question

A trader purchases 70 Kg of tea at the rate of ₹ 200/Kg and another 30 kg at the rate of ₹ 250/Kg. He pays a sales tax of 4% on the transaction. He mixes both of them and sells the product at the rate of ₹ 240/Kg. What is the percentage gain or loss? (find approximate value)

Answer

Price of 1^{st} type tea = 200/kg

Quantity = 70 kg

Amount = 200 x 70

= 14000

Price of 2^{nd} type tea = 250/kg

Quantity = 30 kg

Amount = 250 x 30

= 7500

Total amount = 7500+14000

= 21500

Tax = 4%

Tax amount = $\frac{4}{100} \times 21500$

= 860

Net amount for tea = total amount + tax

purchase (CP)

= 21500+860

= 22360

Total quantity for sale = 100 kg

Rate of selling = 240/kg

Total amount of sale (SP) = 240 x 100

= 24000

Overall Profit/Loss = SP– CP

= 24000-22360

Profit = 1640

Profit % $= \frac{\text{Profit}}{\text{CP}} \times 100\ \%$

$\Rightarrow \text{Profit}\ \% = \frac{1640}{22360} \times 100$

$\Rightarrow \text{Profit}\% = 100 \times 0.0733$

= 7.33%

∴ Profit % is 7.33 %

Additional Problems 9

1 A. Question

Nine percent of ₹ 700 is:

A. ₹ 63

B. ₹ 630

C. ₹ 6.3

D. ₹ 0.63

Answer

Nine percent of ₹ 700 $= \frac{9}{100} \times 700 = ₹63$

1 B. Question

What per cent of 50 metres are 12 metres?

A. 20%

B. 60%

C. 24%

D. 32%

Answer

Let the required percentage be x%.

$$\Rightarrow \frac{x}{100} \times 50 = 12$$

$\Rightarrow x = 12 \times 2 = 24\%$

1 C. Question

The number whose 8% is 12 is:

A. 120

B. 150

C. 130

D. 140

Answer

Let the required number be x.

$$\Rightarrow \frac{8}{100} \times x = 12$$

$$\Rightarrow x = 12 \times \frac{100}{8}$$

$\Rightarrow x = 150$

1 D. Question

An article costing ₹ 600 is sold for ₹ 750. The gain percentage is:

A. 20

B. 25

C. 30

D. 35

Answer

Given CP = ₹ 600 and SP = ₹ 750

Gain = SP – CP = ₹ 750 - ₹ 600 = ₹ 150

$$\text{Gain Percentage} = \frac{\text{Gain}}{\text{CP}} \times 100$$

$$\Rightarrow \text{Gain Percentage} = \frac{150}{600} \times 100 = 25\%$$

1 E. Question

By selling note book for ₹ 22 a shopkeeper gains 10%. The cost price of the book is:

A. 18

B. 30

C. 20

D. 22

Answer

Given SP = ₹ 22 and gain = 10%

$$\text{Gain Percentage} = \frac{\text{Gain}}{\text{CP}} \times 100$$

$$\Rightarrow 10 = \frac{\text{Gain}}{\text{CP}} \times 100$$

⇒ CP = 10 × Gain

Gain = SP – CP

⇒ SP = Gain + CP

⇒ 22 = Gain + 10Gain

⇒ 22 = 11 Gain

⇒ Gain =₹ 2

So, CP = 10 × Gain =₹ 20

1 F. Question

The percentage of loss, when an article worth ₹ 10,000 wassold for ₹ 9,000 is:

A. 10

B. 20

C. 15

D. 25

Answer

Given CP = ₹ 10,000 and SP = ₹9,000

Loss = CP – SP = ₹ 10000 - ₹ 9000 = ₹ 1000

$$\text{Loss Percentage} = \frac{\text{Loss}}{\text{CP}} \times 100$$

$\Rightarrow$ Loss Percentage = $\frac{1000}{10000} \times 100 = 10\%$

1 G. Question

A radio marked 1000 is given away for ₹ 850. The discount is:

A. ₹ 50

B. 100

C. 150

D. 200

Answer

Given MP = ₹1000 and SP = ₹ 850

Discount = MP – SP = ₹1000 - ₹ 850 = ₹ 150

1 H. Question

A book marked ₹ 250 was sold for ₹ 200 after discount. The percentage of discount is:

A. 10

B. 30

C. 20

D. 25

Answer

Given MP = ₹250 and SP = ₹ 200

Discount = MP – SP = ₹250 - ₹ 200 = ₹ 50

Discount Percentage = $\frac{\text{Discount}}{\text{MP}} \times 100$

$\Rightarrow$Discount Percentage = $\frac{50}{250} \times 100 = 20\%$

1 I. Question

The marked price of an article is ₹ 200. If 15% of discount is allowed on it, its selling price is:

A. ₹ 185

B. ₹ 170

C. ₹ 215

D. ₹ 175

Answer

Given MP = ₹200 and Discount % = 15%

$$\text{Discount Percentage} = \frac{\text{Discount}}{\text{MP}} \times 100$$

$$\Rightarrow 15 = \frac{\text{Discount}}{200} \times 100$$

⇒ Discount = ₹30

Discount = MP – SP

⇒ SP = MP – Discount

⇒ SP = ₹200 - ₹ 30 = ₹ 170

1 J. Question

One sells his bike through a broker by paying ₹ 200 brokerage.The rate of brokerage is 2%. The selling price of the bike is:

A. ₹ 12,000

B. ₹ 10,000

C. ₹ 14,000

D. ₹ 12,500

Answer

Given that brokerage = ₹200

Rate of brokerage = 2%

Let the SP be ₹ x

Then

$$\text{Brokerage} = \frac{\text{Brokerage Rate}}{100} \times \text{SP}$$

$$\Rightarrow 200 = \frac{2}{100} \times \text{SP}$$

⇒ SP = ₹ 10000

1 K. Question

The brokerage amount for a deal of ₹25,000 at 2% rate of commission is:

A. ₹ 500

B. ₹ 250

C. ₹ 5,000

D. ₹ 2,500

Answer

Given that SP = ₹25,000

Rate of brokerage = 2%

Then

$$\text{Brokerage} = \frac{\text{Brokerage Rate}}{100} \times \text{SP}$$

$$\Rightarrow \text{Brokerage Amount} = \frac{2}{100} \times 25000$$

⇒ Brokerage Amount = ₹ 500

1 L. Question

If ₹ 1,600 is the commission at 8% for goods sold through abroker, the selling price of the goods is:

A. ₹ 18,000

B. ₹ 20,000

C. ₹ 22,000

D. ₹ 24,000

Answer

Given that brokerage = ₹1600

Rate of brokerage = 8%

Let the SP be ₹ x

Then

$$\text{Brokerage} = \frac{\text{Brokerage Rate}}{100} \times \text{SP}$$

$$\Rightarrow 1600 = \frac{8}{100} \times \text{SP}$$

⇒ SP = ₹ 20000

1 M. Question

The simple interest on ₹ 5,000 at 2% per month for 3 months is:

A. ₹ 100

B. ₹ 200

C. ₹ 300

D. ₹ 400

Answer

Given: Principle = ₹ 5,000, time = 3 months, Rate = 2% per month

$$\text{Simple Interest } = \frac{P \times R \times T}{100}$$

$$\Rightarrow \text{Simple Interest } = \frac{5000 \times 2 \times 3}{100} = ₹\,300$$

1 N. Question

The time in which simple interest on a certain sum be 0.15times the principal at 10% per annum is:

A. 1.5 years

B. 1 year

C. 2 years

D. 2.5 years

Answer

Given: Let Principle be ₹P, Rate = 10% per annum, Simple Interest = ₹ 0.15 P

$$\text{Simple Interest } = \frac{P \times R \times T}{100}$$

$$\Rightarrow 0.15P = \frac{P \times 10 \times t}{100}$$

⇒ t = 1.5 years

1 O. Question

The principal that yields a simple interest of ₹ 1,280 at 16%per annum for 8 months is:

A. ₹ 10,000

B. ₹ 12,000

C. ₹ 12,800

D. 14,000

Answer

Given: Rate = 16% per annum, Simple Interest = ₹ 1280,

$$\text{Time} = 8 \text{ months}$$

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

$$= \frac{2}{3} \text{years}$$

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow 1280 = \frac{P \times 16 \times 2}{100 \times 3}$$

⇒ P = ₹ 12,000

2. Question

A time interval of 3 minutes and 20 seconds is wrongly measured at 3 minutes and 25 seconds. What is the percentage error?

Answer

Given: Actual Value = 3 minutes and 20 seconds = 200 seconds and Observed Value = 3 minutes and 25 seconds = 205 seconds

Error = Observed Value – Actual Value

Error= 5 seconds

$$\text{Error percentage} = \frac{\text{Error}}{\text{Actual Value}} \times 100$$

$$\Rightarrow \text{Error percentage} = \frac{5}{200} \times 100 = 2.5\%$$

3. Question

Hari reads 22% of the pages of a book on the first day, 53% on the second day and 15% on the third day. If the number of pages remaining to be read is 30, find the total number of pages in the book.

Answer

Given: % of pages read on first day = 22%

% of pages read on second day = 53%

% of pages read on third day = 15%

Total pages read = (22 + 53 + 15)% = 90%

Pages left to read = 10 %

According to the question,

10% of pages = 30

⇒ 100% of pages = 300

Hence, total pages in the book = 300

4. Question

If 55% of students in a school are girls and the number of boys is 270, find the number of girls in the school.

Answer

Given: %age of girls in the school = 55%

Number of boys in the school = 270

⇒ 45% of students in the school are boys.

Let total students be x

According to the question,

45% of x = 270

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

⇒ x = 600

Number of girls = 600 – 270 = 330

5. Question

By selling an article for ₹ 920, a shopkeeper gains15%. Find the cost price of the article.

Answer

Given: SP = ₹ 920, gain = 15%

$$\text{Gain Percentage} = \frac{\text{Gain}}{\text{CP}} \times 100$$

$$\Rightarrow 15 = \frac{\text{Gain}}{\text{CP}} \times 100$$

$$\Rightarrow \text{CP} = \frac{100}{15} \times \text{Gain}$$

$$\Rightarrow \text{CP} = \frac{20}{3} \times \text{Gain}$$

Gain = SP – CP

⇒ SP = Gain + CP

$$\Rightarrow 920 = \text{Gain} + \frac{20}{3}\text{Gain}$$

$$\Rightarrow 920 = \frac{23}{3}\text{Gain}$$

⇒ Gain = ₹ 120

So, CP = SP - Gain =₹ 920 - ₹120 = ₹ 800

6. Question

Amit sells a watch at a 20% gain. Had he sold it for ₹ 36 more, he would have gained 23%. Find the cost price of the watch.

Answer

Given: Gain = 20%

If SP is increased by ₹ 36, gain = 23%

$$\text{Gain Percentage} = \frac{\text{Gain}}{\text{CP}} \times 100$$

By an increase of ₹ 36, gain increases by 3%

$$\Rightarrow \frac{36}{\text{CP}} \times 100 = 3$$

⇒ CP = ₹ 1200

7. Question

On selling apples at 40 per Kg, a vendor incurs 10% loss. If he incurs a total loss of ₹ 120, calculate the quantity (in Kg) of apples he sold.

Answer

Given: SP = ₹40 per kg, total loss =₹120

Loss% = 10

Let the total quantity be x kg

CP = SP + Loss

⇒ CP = 40x + 120..(1)

$$\text{Loss Percentage} = \frac{\text{Loss}}{\text{CP}} \times 100$$

$$\Rightarrow 10 = \frac{120}{\text{CP}} \times 100$$

⇒ CP = ₹ 1200

Putting in (1),

⇒ 40x + 120 = 1200

⇒ 40x = 1080

⇒ x = 27

Total quantity = 27 kg

8. Question

A dealer allows a discount of 20% and still gains 20%. Find the marked price of an article which costs the dealer ₹ 720.

Answer

Given: Discount % = 20%, Gain% = 20%, CP = ₹720

$$\text{Gain Percentage} = \frac{\text{Gain}}{\text{CP}} \times 100$$

$$\Rightarrow 20 = \frac{\text{Gain}}{720} \times 100$$

⇒ Gain =₹ 144

SP = CP + Gain

⇒ SP = 720 + 144 = ₹864

$$\text{Discount Percentage} = \frac{\text{Discount}}{\text{MP}} \times 100$$

$$\Rightarrow 20 = \frac{\text{Discount}}{\text{MP}} \times 100$$

⇒ MP = 5 × Discount

Also, Discount = MP – SP

⇒ MP – Discount = SP

⇒ 5 × Discount - Discount = ₹ 864

⇒ 4 × Discount = ₹ 864

⇒ Discount = ₹ 216

MP = 5 × Discount = 5 × 216 = ₹1080

9. Question

A shopkeeper buys an article for ₹ 600 and marks 25% above the cost price. Find (i) the selling price if he sells the article at 10% discount; (ii) the percentage of discount if it is sold for ₹ 690.

Answer

(i) Given: CP = ₹ 600, MP = 125% of CP, Discount = 10%

$$\text{MP} = \frac{125}{100} \times 600 = ₹\,750$$

$$\text{Discount Percentage} = \frac{\text{Discount}}{\text{MP}} \times 100$$

$$\Rightarrow 10 = \frac{\text{Discount}}{750} \times 100$$

⇒ Discount = ₹ 75

SP = MP – Discount = 750 – 75 = ₹ 675

(ii) Given: CP = ₹ 600, MP = 125% of CP, SP =₹ 690

$$\text{MP} = \frac{125}{100} \times 600 = ₹\,750$$

Discount = MP – SP

⇒ Discount = ₹ 750 - ₹ 690= ₹60

$$\text{Discount Percentage} = \frac{\text{Discount}}{\text{MP}} \times 100$$

$$\text{Discount Percentage} = \frac{60}{750} \times 100 = 8\%$$

10. Question

A retailer purchases goods worth ₹ 33,600 and gets a discount of 14% from a whole seller. For paying in cash, the whole seller gives an additional discount of 1.5% on the amount to be paid after the first discount. What is the net amount the retailer has to pay?

Answer

Given: CP =₹ 33,600, First Discount = 14%, Second Discount =1.5%

MP (after first discount)=$\frac{86}{100} \times 33600 = ₹28,896$

SP (after additional discount)=$\frac{98.5}{100} \times 28896 = ₹28,462.50$

11. Question

An old car was disposed through a broker for ₹ 42,000. If the broker age is 2 1/2%, find the amount the owner gets.

Answer

Given that SP = ₹42,000

Rate of brokerage = 2.5%

Then

$$\text{Brokerage} = \frac{\text{Brokerage Rate}}{100} \times \text{SP}$$

$$\Rightarrow \text{Brokerage Amount} = \frac{2.5}{100} \times 42000$$

⇒ Brokerage Amount = ₹ 1050

Amount the owner gets = ₹42,000 - ₹1050 = ₹41050

12. Question

A milk-man sells 20 litres of milk every day at ₹ 22. He receives a commission of 4% for every litre. Find the total commission he receives in a month of 30 days.

Answer

Given: Total milk sold per day =20 litres, SP of 1-litre milk = ₹22

The rate of brokerage = 4%

Then

$$\text{Brokerage} = \frac{\text{Brokerage Rate}}{100} \times \text{SP}$$

⇒ Brokerage Amount = $\frac{4}{100} \times 22$

⇒ Brokerage Amount = ₹ 0.88

Total commission of a day = ₹0.88 × 20 = ₹17.60

Total commission of a month =₹17.60 × 30 = ₹528.00

13. Question

A bike was sold for ₹ 48,000 and a commission of ₹ 8,640 was received by the dealer. Find the rate of commission.

Answer

Given: SP = ₹48,000, Brokerage amount =₹ 8,640

Then

$$8640 = \frac{\text{Brokerage Rate}}{100} \times 48000$$

$$\Rightarrow \text{Brokerage Rate} = \frac{8640}{48000} \times 100$$

⇒ Brokerage Rate = 18%

14. Question

In how many years will a sum of money becomes three times at the rate of interest 10% per annum?

Answer

Given: Let Principle be ₹ P, Rate = 10% per annum, Amount = ₹ 3P

Simple Interest =Amount – Principle

Simple Interest = 3P – P = 2P

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow 2P = \frac{P \times 10 \times t}{100}$$

⇒ t = 20 years

15. Question

In what time will the simple interest on a certain sum be 0.24 times the principal at 12% per annum?

Answer

Given: Let Principle be ₹ P, Rate = 12% per annum, Simple Interest =0.24P

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow 0.24P = \frac{P \times 12 \times t}{100}$$

⇒ t = 2 years

16. Question

Find the amount of ₹ 30,000 from 15th January 2010 to 10th August 2010 at 12% per annum.

Answer

Given: Principle = ₹ 30,000, Rate = 12% per annum, Time = 208 days

$$\text{Time} = \frac{208}{365} \text{ years}$$

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow \text{Simple Interest} = \frac{30000 \times 12 \times 208}{100 \times 365}$$

⇒ Simple Interest =₹2051.507

Amount =Principle + Interest

Amount =30,000 + ₹2051.507=₹32,051.507

17. Question

A person purchases electronic items worth ₹ 2,50,000. The shopkeeper charges him a sales tax of 21% instead of 12%. The consumer does not realise that he has overpaid. But after some time he finds that he has paid excess and asks the shopkeeper to return the excess money. The shopkeeper refuses and the consumer moves the consumer court. The court with due hearing orders the shopkeeper to pay the consumer the excess money paid by the way of sales tax, with an interest of 12% per annum. If the whole deliberation takes 8 months, what is the money that the consumer gets back?

Answer

Given: Taxable Amount = ₹ 2,50,000, Actual sales tax = 12%, Charged sales tax = 21%

Excess amount charged = 9% of 2,50,000

$$\Rightarrow \text{Excess amount charged} = \frac{9}{100} \times 250000 = ₹\,22500$$

Now, for interest:

P = ₹ 22500, R = 12%per annum, time = 8 months

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\text{Interest on Excess Amount} = \frac{22500 \times 12 \times 8}{100 \times 12} = ₹\,1800$$

Amount Received by consumer = ₹22500 + ₹1800 = ₹24300