Comparing Quantities

Question 1. Rashmi obtains 480 marks out of 600. Rajan obtains 560 marks out of 700. Whose performance is better?

Solution: Rashmi obtains 480 marks out of 600

Marks Percentage = 480600 × 100 = 80%

Rajan obtains 560 marks out of 700

Marks Percentage = 560700 × 100 = 80%

Since, both of them obtained the same per cent of marks i.e. 80%.

So, their performance cannot be compared.

Question 2. ₹ 9000 becomes ₹ 18000 at simple interest in 8 years. Find the rate per cent per annum.

Question 3. The cost of an object is increased by 12%. If the current cost is ₹ 896, what was its original cost?

Question 4. Radhika borrowed ₹ 12000 from her friends. Out of which ₹ 4000 were borrowed at 18% and the remaining at 15% rate of interest per annum. What is the total interest after 3 years?

Solution: Total amount borrowed by Radhika = ₹ 12,000

The amount borrowed by her at 18% p.a. = ₹ 4000

$$\therefore \text{ Interest} = \frac{P \times R \times T}{100} = \frac{4{,}000 \times 18 \times 3}{100}$$
$$= ₹\ 2160$$

Remaining amount
$$= ₹\ 12{,}000 - ₹\ 4{,}000 = ₹\ 8{,}000$$

$$\text{Interest on } ₹\ 8000 = \frac{P \times R \times T}{100} = \frac{8{,}000 \times 15 \times 3}{100}$$
$$= ₹\ 3600$$

Total interest = ₹ 2160 + ₹ 3600 = ₹ 5760

Hence, the total interest = ₹ 5760.

Question 5. Bhavya earns ₹ 50,000 per month and spends 80% of it. Due to pay revision, her monthly income increases by 20% but due to price rise, she has to spend 20% more. Find her new savings

Question 6. The simple interest on a certain sum at 5% per annum for 3 years and 4 years differ by ₹ 82. Find the sum.

Solution: Let the required sum be ₹ P.

Simple interest for 3 years

$$= \frac{P \times R \times T}{100} = \frac{P \times 5 \times 3}{100} = ₹ \frac{3P}{20}$$

Simple interest for 4 years $= \frac{P \times R \times T}{100}$

$$= \frac{P \times 5 \times 4}{100} = ₹ \frac{4P}{20}$$

As per the question, we have

$$\frac{4P}{20} - \frac{3P}{20} = 82 \quad \Rightarrow \quad \frac{P}{20} = 82$$

$$\Rightarrow \qquad\qquad P = 20 \times 82 = ₹ 1640$$

Hence, the required sum = ₹ 1640

Alternate Method

Simple Interest gained from 3rd to 4th year = ₹ 82

Time (4th year – 3rd year) = 1 year

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

$$P = \frac{82 \times 100}{5 \times 1} = 1640$$

Required sum = ₹ 1640

Question 21. Rajan's monthly income is 20% more than the monthly income of Sarita. What per cent of Sarita's income is less than Rajan's monthly income?

Question 22. If 10 apples are bought for ₹ 11 and sold at the rate of 11 apples for ₹ 10. Find the overall gain or loss per cent in these transactions.

Solution: CP of 10 apples = ₹ 11

CP of 1 apple = ₹ 1110

SP of 11 apples = ₹ 10

SP of 1 apple = ₹ 1011

Clearly CP > SP $\left(\because \frac{11}{10} > \frac{10}{11} \right)$

$\therefore \quad$ Loss $= ₹ \left(\frac{11}{10} - \frac{10}{11} \right)$

$$= ₹ \left(\frac{121 - 100}{110} \right) = ₹ \frac{21}{110}$$

On $₹ \frac{11}{10}$, the loss $= ₹ \frac{21}{110}$

On ₹ 1, the loss $= ₹ \frac{21}{110} \times \frac{10}{11}$

On ₹ 100, the loss $= ₹ \frac{21}{110} \times \frac{10}{11} \times 100$

$$= \frac{2100}{121} \% = 17 \frac{43}{121} \%$$

Hence, the overall loss $= 17 \frac{43}{121} \%$.

Question 23. If 25 men can do a work in 36 hours, find the number of men required to do the same work in 108 hours.

Question 24. A machine is sold by A to B at a profit of 10% and then B sold it to C at a profit of 20%. If C paid ₹ 1200 for the machine, what amount was paid by A to purchase the machine?