PERCENTAGE:-

A percentage is a ratio inwhich second number is 100. It is a fraction with denuminator 100.

Question: Express in percentage:

i) $\dfrac{9}{25}$ ii) $\dfrac{1}{7}$ iii) $\dfrac{29}{40}$ iv) $\dfrac{7}{20}$

Solution:-

i) $\dfrac{9}{25} = \dfrac{9}{25} \times \dfrac{100}{100} = \dfrac{9\times4}{100} = \dfrac{36}{100} = 36\%$

ii) $\dfrac{1}{7} = \dfrac{1}{7} \times \dfrac{100}{100} = \dfrac{14.28}{100} = 14.28\%$

iii) $\dfrac{29}{40} = \dfrac{29}{40} \times \dfrac{100}{100} = \dfrac{29\times2.5}{100} = \dfrac{72.5}{100} = 72.5\%$

iv) $\dfrac{7}{20} = \dfrac{7}{20} \times \dfrac{100}{100} = \dfrac{7\times5}{100} = \dfrac{35}{100} = 35\%$

Question:- Express the following % into numbers:

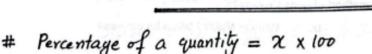i) 40% ii) 7.5% iii) 112% iv) 24.5%

Solution:-

i) $40\% = \dfrac{40}{100} = \dfrac{4}{10} = \dfrac{2}{5}$

ii) $7.5\% = \dfrac{7.5}{100} = \dfrac{7.5}{100} \times \dfrac{10}{10} = \dfrac{75}{1000} = \dfrac{3}{40}$

iii) $112\% = \dfrac{112}{100} = \dfrac{56}{50} = \dfrac{28}{25}$

iv) $24.5\% = \dfrac{24.5}{100} = \dfrac{24.5}{100} \times \dfrac{10}{10} = \dfrac{245}{1000} = \dfrac{49}{200}$

\# Percentage of a quantity $= x \times 100$

\# Percentage of a quantity x from $y = \dfrac{x}{y} \times 100$

Question:- Find 17% of $1\,kg$ and 27% of $2\,km$.

Sol:-

17% of $1\,kg = 1 \times \dfrac{17}{100}kg = \dfrac{17}{100}\,kg = \dfrac{17\times1000}{100}g = 17\times10\,g = 170\,g$.

27% of $2\,km = 2 \times \dfrac{27}{100}\,km = \dfrac{54}{100}\,km = \dfrac{54\times1000}{100}m = 54\times10\,m = 540\,m$.

Question:-

A party held in a restaurant cost £78 plus $17\frac{1}{2}\%$ in tax. Find the total bill.

Solution:-

$$Cost = £\ 78$$

$$Tax = 17\frac{1}{2}\% = 17.5\% = 78 \times \frac{17.5}{100} = £13.65$$

$$Total\ bill = Cost + Tax = £\ 78 + £\ 13.65 = £\ 91.65$$

Question:- Shashi scores 56 marks out of 80 in an examination. Calculate shashi's percentage score.

Solution:-

Total marks = 80

Scored marks = 56

$$Percentage = \frac{Scored\ marks}{Total\ marks} \times 100 = \frac{56}{80} \times 100 = 70\%$$

Question:- 75% of a quantity is 1260. Find the original Quantity.

Solution:- Let x be original Quantity.

$$75\%\ of\ x = 1260$$

$$\Rightarrow x \times \frac{75}{100} = 1260 \qquad \Rightarrow \qquad x = \frac{100}{75} \times 1260$$

$$\Rightarrow x = \frac{4}{3} \times 1260 = 1680.$$

Question:- The price of a Jewellary box is $72. There is 5% discount on the product. What will be its discounted price?

Solution:-

Original Price = $ 72

$$Discount = 5\% = \frac{5}{100} \times 72 = \$\ 3.6$$

Discounted price = Original Price - discount

$$= \$\ 72 - \$\ 3.6 = \$\ 68.4$$

Question:- There was a Sale of flat 30% on each product. A suit cost after discount was 2240 rupees. What was its original price?

Solution:- Discount = 30%   Let x be original price

Discounted price = 2240

$$\Rightarrow 2240 = x - 30\% x \quad or \quad 2240 = x - \frac{30}{100}x = x\left(\frac{100-30}{100}\right)$$

$$\Rightarrow x = \frac{2240 \times 100}{100-30} = \frac{2240 \times 100}{70} = 3200\ Rs.$$

Profit and Loss :-

Cost Price: The price at which a particular item is purchased.
It is denoted by "CP"

Selling Price:- The price at which a particular item is sold.
It is denoted by "SP"

Profit:- If Selling Price is greater than Cost price then profit is earned.
It is denoted by "P"

Note:

$$(P) \text{ Profit} = SP - CP$$

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

$$SP = CP + \text{Profit} \quad \text{or} \quad CP = SP - \text{Profit}$$

$$SP = CP + \frac{CP \times \% \text{ Profit}}{100} = CP\left[\frac{100 + \% \text{ Profit}}{100}\right]$$

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

Loss:- If Selling Price is less than Cost price then loss is earned.
It is denoted by "L"

$$(L) \text{ Loss} = CP - SP$$

$$SP = CP - \text{Loss} \quad \text{or} \quad CP = SP + \text{Loss}$$

Note:

$$\% \text{ Loss} = \frac{\text{Loss}}{CP} \times 100 \quad \text{and} \quad \text{Loss} = \frac{CP \times \% \text{ Loss}}{100}$$

$$SP = CP\left[\frac{100 - \text{Loss} \%}{100}\right] \quad CP = SP\left[\frac{100}{100 - \% \text{ Loss}}\right]$$

Question:- A bicycle was purchased for Rs. 3450 and Sold for Rs. 3850
Find the percentage profit.

Solution:- CP = 3450   SP = 3850

Profit = SP - CP = 3850 - 3450 = 400 Rs.

$$\% \text{ Profit} = \left(\frac{\text{Profit}}{CP} \times 100\right) = \frac{400}{3450} \times 100 = 11.59\% = 11.6\%$$

Question:- A trader earns a profit of 20% by selling a chair for RS.2700 Find Cost price of the chair.

Solution:- CP = ? SP = 2700 % Profit = 20

$$\because CP = SP \times \frac{100}{100 + \% \, Profit}$$

$$CP = 2700 \times \frac{100}{100 + 20} = 2700 \times \frac{100}{120} = 2250 \, Rs.$$

Question:- A book was purchased for Rs. 500 and Sold with 30% profit. What was its selling price?

Solution:- CP = 500 % Profit = 30 SP = ?

$$\because SP = CP \times \frac{100 + \% \, Profit}{100}$$

$$SP = 500 \times \frac{100 + 30}{100} = 500 \times \frac{130}{100} = Rs. \, 650$$

Question:- A house was purchased for 300000 Rs and Sold for 280000 Rs. Calculate its percentage loss.

Solution:- CP = Rs. 300000 SP = 280000 % Loss = ?

$$\because Loss = CP - SP = 300000 - 280000 = 20000 \, Rs.$$

$$\% Loss = \frac{Loss}{CP} \times 100 = \frac{20000}{300000} \times 100 = 6.67\%$$

Question:- In selling a Coat for 4800 Rs, a loss of 3% is earned. Find its Cost price.

Solution:- SP = Rs. 4800 % Loss = 3 CP = ?

$$\because CP = SP \times \frac{100}{100 - \% \, loss}$$

$$CP = 4800 \times \frac{100}{100 - 3} = 4800 \times \frac{100}{97} = Rs. \, 4948.5$$

Question:- A car of Cost 1200000 Rs was sold with 8% loss. Find its Selling price.

Solution SP = ? % Loss = 8 CP = 1200000 Rs

$$\because SP = CP \times \frac{100 - \% \, loss}{100} = 1200000 \times \frac{100 - 8}{100} = 1200000 \times \frac{92}{100}$$

$$SP = Rs. \, 1104000.$$

Question:- A shopkeeper sales an item with 12% Profit at Rs. 1680 and another item with 7% loss at Rs. 3255. Find his total profit or loss.

Solution:-

For 1st item:

$SP_1 = 1680\ Rs$

$\%\ Profit = 12$

$CP_1 = ?$

$CP_1 = SP_1 \times \dfrac{100}{100 + \%\ Profit}$

$= 1680 \times \dfrac{100}{100+12}$

$= 1680 \times \dfrac{100}{112} = 1500\ Rs.$

For 2nd item:

$SP_2 = 3255$

$\%\ Loss = 7$

$CP_2 = ?$

$CP_2 = SP_2 \times \dfrac{100}{100 - \%\ Loss}$

$= 3255 \times \dfrac{100}{100-7}$

$= 3255 \times \dfrac{100}{93} = 3500\ Rs.$

Total Sale Price (SP) $= SP_1 + SP_2 = 1680 + 3255 = 4935\ Rs.$
Total Cost Price (CP) $= CP_1 + CP_2 = 1500 + 3500 = 5000\ Rs.$

$\because CP > SP$ so Loss $= CP - SP = 5000 - 4935 = 65$ Rs.

$\%\ Loss = \dfrac{Loss}{CP} \times 100 = \dfrac{65}{5000} \times 100 = 1.3\%$

Discount:- A deduction offered on marked price is called discount.

$$\boxed{Discount = MP - SP}$$

where MP = Marked Price and SP = Sale Price.

$$\boxed{SP = MP - Discount}$$

$$\boxed{\%\ Discount = \dfrac{Discount}{MP} \times 100}$$

$$\boxed{SP = MP \times \dfrac{100 - \%\ Discount}{100}}$$ and $$\boxed{MP = SP \times \dfrac{100}{100 - \%\ Discount}}$$

Question:- The marked Price of a Ceiling fan is 720 and Sale Price is 684. Find the percent discount.

Solution:- $MP = Rs.\ 720$ $\qquad SP = Rs.\ 684$ $\qquad \%\ Discount = ?$

$Discount = MP - SP = 720 - 684 = Rs.\ 36$

$\%\ Discount = \dfrac{Discount}{MP} \times 100 = \dfrac{36}{720} \times 100 = 5\%$

Question:- A shopkeeper sales a Calculator for $ 20 with 20% discount. What is the marked price of Calcular?

Solution:- MP = ?   SP = $ 20   Discount = 20%

$$\because \quad MP = SP \times \frac{100}{100 - \% \, Discount}$$

$$= 20 \times \frac{100}{100 - 20} = 20 \times \frac{100}{80} = \$ \, 25.$$

Question:- A departmental store offers a discount of 10% on each item. A dinner set was purchased for Rs. 8450. What is its listed price?

Solution: MP = ?   SP = 8450 Rs   % Discount = 10%

$$MP = SP \times \frac{100}{100 - \% \, Discount}$$

$$= 8450 \times \frac{100}{100 - 10} = 8450 \times \frac{100}{90} = Rs. \, 9388.89$$

$$= Rs. \, 9389$$

Question:- A bicycle is marked by Rs. 9000. What will be its sale Price by applying a discount of 12%?

Solution:- SP = ?   MP = Rs. 9000   Discount = 12%

$$\because \quad SP = MP \times \frac{100 - \% \, Discount}{100}$$

$$= 9000 \times \frac{100 - 12}{100} = 9000 \times \frac{88}{100} = Rs. \, 7920$$

Zakat :-

Zakat is one of basic five pillars of Islam.

It is paid at a rate of 2.5% or $\frac{1}{40}$ of total Amount.

Question:- Mr. Zulfiqar owns an amount of Rs. 2000000. What will be Zakat on his amount? After Zakat, what will be his amount?

Solution:-

Total Amount = Rs. 2000000

Zakat rate = 2.5%

$$Zakat = 2000000 \times \frac{2.5}{100} = Rs. \, 50000$$

After Zakat net Amount = 2000000 − 50000

$$= 1950000 \ \ Rs.$$