

Assignment NO - 1

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Percentage & Profit & Loss

1) What is 25% of 200?

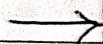
$$\frac{25}{100} \times 200$$

$$= \frac{1}{4} \times 200$$

$$= \frac{200}{4}$$

$$= \boxed{50}$$

2) If 40% of a number is 80,
what is the number?



$$40\% + 40\% + 20\% = 100\%$$

$$80 + 80 + 40 = 200$$

$$= \boxed{200}$$

3) 75% of a number is 150. what is
the number?



$$\frac{75}{100} = \frac{150}{x}$$

$$75x = 150 \times 100$$

$$75x = 15000$$

$$x = \frac{15000}{75}$$

$$x = 200$$

$$\boxed{x = 200}$$

What is 15% of 120?

$$\rightarrow \frac{15}{100} \times 120$$

$$= 15 \times 12$$

10

$$= 18\text{ }₹$$

10

$$= 18\boxed{1}$$

22.00,000

of 0%

5] If 30% of a number is 90, then the number is

$$\rightarrow \frac{30}{100} = \frac{90}{?}$$

$$30\text{ }?= 90\text{ }00$$

$$? = \frac{9000}{3}$$

30

$$? = 300\boxed{1}$$

22.00,000

of 0%

6] The price of a product increases from ₹200 to ₹250, what is the percentage increase?

$$\rightarrow 200 \rightarrow 250$$

$$250 - 200 = 50 \uparrow$$

$$\frac{50}{200} = \frac{1}{4}$$

$$25\%\boxed{1}$$

7) A salary increases from ₹40,000 to ₹50,000. what is the percentage increase?

$$\rightarrow 40,000 \rightarrow 50,000 \quad 10,000 \uparrow$$

$$\frac{10,000}{40,000} = \frac{1}{4} = \boxed{25\%}$$

- (8) The population of a town decreased from 10,000 to 8000. What is the percentage decrease?

$$\rightarrow 10,000 - 8000 = 2000$$

$$\frac{2000}{10,000} = \frac{1}{5} = 20\%$$

20% decrease.

- (9) A book's price drops from ₹ 500 to ₹ 400. What is the percentage decrease?

$$\rightarrow 500 - 400 = 100$$

$$\frac{100}{500} = \frac{1}{5} = 20\%$$

20% decrease.

- (10) If the cost price of an item is ₹ 600 and the selling price is ₹ 450, what is the percentage loss?

$$\rightarrow CP = 600$$

$$SP = 450$$

$$Loss = SP - CP$$

$$Loss = 150$$

$$\frac{150}{600} \times 100 = \frac{1}{4} \times 100 = \frac{100}{4} = 25\%$$

25% Loss

(ii) Which is greater : 30% of 400 or 40% of 300

$$\begin{array}{r}
 30 \text{ } \cancel{\text{of } 400} \\
 100 \quad \cancel{81} \\
 \hline
 30 \cancel{81} = 40000
 \end{array}
 \quad
 \begin{array}{r}
 30 \text{ } \cancel{\text{of } 400} \\
 100 \quad 400 \\
 \hline
 30 \times 400 = \cancel{81}
 \end{array}
 \quad
 \begin{array}{r}
 40 \text{ } \cancel{\text{of } 300} \\
 100 \quad \cancel{81} \\
 \hline
 40 \times 300 = \cancel{81}
 \end{array}$$

$$\begin{array}{r}
 81 = 40000 \\
 81 = 12000 \\
 \hline
 81 = 120
 \end{array}
 \quad
 \begin{array}{r}
 12000 = \cancel{81} \\
 100 \\
 \hline
 12000 = \cancel{81}
 \end{array}
 \quad
 \begin{array}{r}
 12000 = \cancel{81} \\
 100 \\
 \hline
 12000 = \cancel{81}
 \end{array}$$

$$\begin{array}{r}
 81 = 120 \\
 81 = 120
 \end{array}$$

Both are equal

(12) A person spends 60% of his income and saves £ 8000, what is his total income?

$$40\% \text{ save} = 800$$

60% spend

$$\begin{array}{r}
 40 = 8000 \\
 100 \quad \cancel{81}
 \end{array}$$

$$40 \cancel{81} = 800000$$

$$\cancel{81} = 20000$$

(13) If A is 20% more than B, then B is how much less than A

A is 20% > B

$$A + 20\% = B$$

$$B = 100 \therefore A = 120$$

$$\begin{array}{r}
 20 \\
 120 \quad \cancel{6}
 \end{array}
 = \frac{1}{6} = 16.67\%$$

= 16.67% B is less than A.

- (14) If the price of sugar is increased by 25% a year, by how much should the consumption be reduced to maintain the same expense?

$$\begin{array}{ccc} \xrightarrow{\hspace{1cm}} & & \\ 100 & \xrightarrow{25\% \uparrow} & 125 \\ & & \\ \frac{25}{125} \times 100 & = & \frac{1}{5} \times 100 \\ & & \\ & = & \boxed{20\%} \end{array}$$

- (15) If A's income is 40% more than B's income, then B's income is what percentage less than A's income?

$$\begin{array}{ccc} \xrightarrow{\hspace{1cm}} & & \\ 100 & \rightarrow & 140 \\ & & \\ \frac{40}{140} \times 100 & = & \frac{2}{7} \times 100 \\ & & \\ & = & \boxed{28.57\%} \end{array}$$

- (16) The price of an item is increased by 20% and then decreased by 10%. What is the net percentage change?

$$\begin{array}{ccc} \xrightarrow{\hspace{1cm}} & & \\ 100 & \downarrow 20\% \uparrow & \\ 120 & \downarrow 10\% \downarrow & \\ 108 & = & (120 - 12) \end{array}$$

$\boxed{8\% \text{ increase}}$

(17)

A number is increased by 30% & then decreased by 20%. What is the final percentage change?



$$\begin{array}{r} 100 \\ \downarrow 30\% \uparrow \\ 130 \\ \downarrow 20\% \downarrow \\ (130 - 26) = 104 \end{array}$$

$\therefore 4\%$ increase.

(18)

If the population of a city increases by 25% & then decreases by 20%, what is the net percentage change?



$$\begin{array}{r} 100 \\ \downarrow 25\% \uparrow \\ 125 \\ \downarrow 20\% \downarrow \\ (125 - 25) = 100 \end{array}$$

0%

(19)

If a price increases by 40% & then decreases by 30%, the final change is



$$\begin{array}{r} 100 \\ \downarrow 40\% \uparrow \\ 140 \\ \downarrow 30\% \downarrow \\ (140 - 42) = 98 \end{array}$$

2% decrease

- (20) The salary of a person is first increased by 20% & then decreased by 10%. What is the overall percentage change?

$$\begin{array}{r} 100 \\ \downarrow 20\% \uparrow \\ 120 \\ \downarrow 10\% \downarrow \\ (120 - 12) = (108) \end{array}$$

8% increase

- (21) If an article is sold at a profit of 25%, then the selling price is what percentage of the cost price?

$$100 \xrightarrow{25\%} 125$$

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

$$= \boxed{125\%}$$

- (22) A shopkeeper allows a discount of 10% on the marked price & still makes a profit of 8%. If the marked price is ₹ 500, what is the cost price.

$$\begin{array}{r} 500 \\ \downarrow 10\% \text{ discount.} \\ 450 \\ \quad \boxed{420} \end{array}$$

(23) If the profit is 20% of the cost price; then what is the profit percentage on the selling price.

$$\begin{array}{r} 100 \\ \downarrow 20\% \uparrow \\ 120 \end{array}$$

$$\frac{20}{120} \times 100 = \frac{1}{6} \times 100 = \boxed{16.67}$$

(24) A product is marked at ₹ 1200 & sold for ₹ 960. What is the percentage discount given?

$$\begin{array}{r} 1200 \\ - 960 \\ \hline 240 \end{array} \quad \begin{array}{r} 21 \\ 240 \\ - 200 \\ \hline 40 \\ \text{to} \\ 5 \end{array} \quad \frac{4}{5} \times 100 = \boxed{20\%}$$

(25) If an article is bought for ₹ 500 & sold for ₹ 650, what is the percentage profit?

$$\begin{array}{r} \rightarrow \\ 650 - 500 = 150 \end{array} \quad \begin{array}{r} +50 \\ 150 \\ \hline 10 \end{array} \quad \begin{array}{r} \times 100 = \frac{3}{10} \times 100 \\ = 300 \\ = \boxed{30\%} \end{array}$$

(26) If A's income is 20% more than B's, then B's income is what percentage less than A's.

$$\begin{array}{r} 100 \rightarrow 120 \\ 20\% \uparrow \end{array} \quad \begin{array}{r} 20 \\ 120 \end{array} \quad \begin{array}{r} \times 100 = \frac{1}{6} \times 100 \\ = 16.67 \\ = \boxed{16.67\%} \end{array}$$

- (27) If the ratio of boys to girls in a School is 3:2, what percentage of the total students are boys.

$$\begin{aligned} \text{Boy} &= \frac{3}{2} \times 100 \\ \text{girl} &= \frac{3}{5} \times 100 \\ &= 60\% \end{aligned}$$

= 60%

- (28) A city's population increased from 2,00,000 to 2,50,000 in 2 years. What is the percentage increase?

$$2,00,000 \rightarrow 2,50,000$$

- (29) In an election, a candidate gets 65% of the total votes and wins by 3000 votes. How many total votes were cast?

$$65 - 35 = 30\%$$

$$65 + 35 = 100$$

$$65 - 35 = 30\% = 3000$$

$$\begin{array}{r} 100 \\ - 30 \\ \hline 70 \end{array} \quad \begin{array}{r} 3000 \\ \times 3 \\ \hline 9000 \end{array}$$

$$10,000$$

(30) The price of an article is reduced by 30%. By what percentage must the new price be increased to restore the original price?

$$100 \xrightarrow{30\% \downarrow} 70$$

$$\frac{30}{70} \times 100 = \frac{300}{7} = 42.85\%$$

(31) If a number is increased by 50% and then decreased by 50%, what is the net % change?

$$\xrightarrow{} 100 \xrightarrow{50\% \uparrow} 150 \xrightarrow{50\% \downarrow} (150 - 75) = 75 \text{ or } 50\% \text{ decrease}$$

(32) If A is 20% taller than B, then B is shorter than A by:

$$100 \xrightarrow{20\% \uparrow} 120 \xrightarrow{\quad}$$

$$16.67\%$$

(33) If 30% of a number is 90, what is 60% of the same number?

$$\frac{30}{90} = \frac{60}{81} = \frac{30}{31} = 54\%$$

$$81 = 180$$

(34)

A person spends 75% of his income & saves ₹ 5000, what is his total income?

$$75 + 25 = 100$$

$$25\% = 5000$$

$$\begin{array}{r} 25 \\ \times 5000 \\ \hline 25 \\ 250 \\ \hline 125 \end{array}$$

$$\therefore \frac{1}{200} = \frac{75}{25}$$

$$25 = 200 \times 75 = 150,00$$

$$15000 + 5000 =$$

$$= 20,000$$

(35) The price of petrol increases by 20%. By what percentage should consumption be reduced to maintain the same expense.

100

$$\downarrow 20\% \uparrow \quad 20 \quad \frac{20}{120} \times 100 = \frac{1}{6} \times 100 = \underline{\underline{16.67\%}}$$

$$= 16.67\%$$

(36)

The price of a TV was first increased by 20% and then decreased by 10%. What is the overall percentage change?

100

$$\downarrow 20\% \uparrow$$

120

$$\downarrow 10\% \downarrow$$

$$(120 - 108) = 108$$

8% increase.

(37)

A. Shopkeeper marks an item 25% above the cost price & gives a 20% discount. what is his profit / Loss percentage?

$$\rightarrow \begin{array}{ccc} 25\% \uparrow & & 20\% \downarrow \\ 100 & \rightarrow & 125 \end{array} \rightarrow (125 - 100) = 25 \text{ Rs}$$

0%

(38)

If the cost price of an article is ₹ 500 & it is sold at a loss of 20%, what is the selling price?

$$C.P = 500$$

$$Loss = 20\%$$

(39)

If a salary is increased by 10% & then decreased by 10%, what is the final percentage change?

$$\begin{array}{ccc} 100 & \rightarrow & 110 \\ 10\% \uparrow & & 10\% \downarrow \end{array}$$

1% decrease.

(40)

A student needs 40% marks to pass. He gets 200 marks and fails by 20 marks. what are the total marks?

$$\rightarrow 200 + 20 = 220 \quad 40\%$$

$$220 \rightarrow 21$$

$$40 \rightarrow 100$$

$$\therefore \frac{11}{2} = \frac{21}{100} \quad \therefore \frac{1100}{2} = 21$$

$$\therefore 21 = 550$$

(41) A man spends 20% of his salary on rent, 30% on food, & 10% on transport. If he saves ₹ 18,000, what is his salary?

$$20 + 30 + 10 = 60\%$$

$$\frac{60}{100} \times \text{Salary} = 18000$$

$$\text{Salary} = \frac{18000 \times 100}{60}$$

The cost of an item is first increased by 30% & then decreased by 30%, what is the overall percentage change?

$$100 \xrightarrow{30\% \uparrow} 130 \xrightarrow{30\% \downarrow} (130 - 39) = 91$$

9% decrease

(43) The population of a town increases by 10% every year. If the current population is 10,000 what will it be after 3 years?

$$10000 \xrightarrow{10\% \uparrow} 11000 \xrightarrow{10\% \uparrow} 12100$$

$$13310$$

(44) If 15% of A is equal to 20% of B, then
A : B is

$$\rightarrow 15\% (A) = 20\% (B)$$

$$\frac{15}{100} A = \frac{20}{100} B$$

$$\therefore 15A = 20B$$

$$\frac{A}{B} = \frac{20}{15} = \frac{4}{3}$$

$$\boxed{A:B = 4:3}$$

(45) If the cost price of an item is ₹ 800 & the profit made is 25%, what is the selling price?

$$\rightarrow C.P. = 800$$

$$P\% = 25\%$$

$$\boxed{S.P. = 1000}$$

(46) If the cost price of an item is ₹ 200 & the selling price is ₹ 250, what is the profit percentage?

$$\rightarrow C.P. = 200$$

$$S.P. = 250$$

$$\boxed{P\% = 25\%}$$

(47) A man sells an article for ₹ 720 at a profit of 20%. Find the cost price.

$$\rightarrow S.P. = 720$$

$$P\% = 20\%$$

$$P = S.P. - C.P. = \cancel{720}$$

$$\cancel{720} - \cancel{C.P.}$$

$$\boxed{C.P. = 600}$$

$$31 \xrightarrow{+20\%} 720 \rightarrow 81$$

$$100 \xrightarrow{+20\%} 120 \rightarrow 100$$

$$\frac{20}{120} \times 100 = \frac{1}{6} \times 100 = \frac{100}{6} = 16.67\%$$

$$\frac{1}{6} \times 720 = 120$$

$$720 - 120 = 600$$

(48) A shopkeeper sells an item at a loss of 15%. If the cost price is ₹ 500, find the selling price.

$$\rightarrow L\% = 15\% \\ C.P. = ₹ 500$$

$$500 \xrightarrow{-15\%} (500 - 75) = 425$$

$$C.P. = ₹ 425$$

(49) ~~_____~~ A mom purchased a cycle for ₹ 1500 & sold it at a loss of 10%. what was the selling price.

$$\rightarrow 1500 \xrightarrow{-10\%} (1500 - 150) = 1350$$

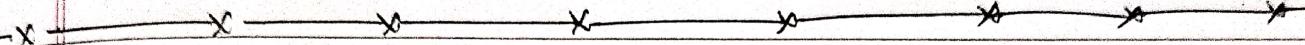
$$S.P. = 1350$$

(50) A trader marks his goods at 30% above the cost price & allows a discount of 10%. what is his gain percent?



$$100 \xrightarrow{80\% \uparrow} 130 \xrightarrow{-10\% \downarrow} 117$$

17 % gain



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

$$\frac{1}{11} = 9.09\%$$

$$\frac{1}{2} = 50\%$$

$$\frac{1}{12} = 8.33\%$$

$$\frac{1}{3} = 33.33\%$$

$$\frac{2}{3} = 66.66\%$$

$$\frac{1}{4} = 25\%$$

$$\frac{3}{4} = 75\%$$

$$\frac{1}{5} = 20\%$$

$$\frac{1}{6} = 16.67\%$$

$$\frac{1}{7} = 14.28\%$$

$$\frac{1}{8} = 11.11\%$$

$$\frac{1}{10} = 10\%$$