

Aptitude - Assignment - I

Topic :- Percentage & Profit and Loss.

1] What is 25% of 200?

strike & cancel the two
zero of 200 with
100.

$$\text{i.e. } 25 \times 2\cancel{0}\cancel{0}$$

$$= \underline{\underline{50}}$$

4] What is 15% of 120.

$$15 \times 12$$

$$= \underline{\underline{18.0}}$$

$$= 18$$

\checkmark
0
↓
point/
decimal

2] If 40% of a number

is 80, what is the number?

$$= \cancel{4}0 \times \cancel{8}0$$

$$= \underline{\underline{32}}$$

3] 75% of a

$$= 40\% \text{ of } x = 80$$

$$0.4x = 80$$

$$\therefore x = \frac{800}{0.4} = \underline{\underline{200}}$$

4] 75% of a number is 150.
what is the number.

$$75\% \text{ of } x = 150$$

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

$$x = \frac{150^2}{75} \times 100$$

$$x = \underline{\underline{200}}$$

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

$$30\% \text{ of } 90 = 90$$

$$\therefore \frac{30}{100} \times x = 90$$

$$x = \frac{90}{3} \times 100$$

$$= 30 \times 10 = \underline{\underline{300}}$$

$$x = \underline{\underline{300}}$$

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

$$\text{change\%} = \frac{\text{New value} - \text{Old}}{\text{Old}} \times 100$$

$$= \frac{250 - 200}{200} \times 100$$

$$= \frac{50}{2} = 25\%$$

25% increase.

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

$$\text{change \%} = \frac{\text{New} - \text{old}}{\text{old}} \times 100$$

$$= \frac{50000 - 40000}{40000} \times 100$$

$$= \frac{10000}{40000} \times 100$$

$$= 0.25 \times 100$$

% increase = 25%.

8] The population of a town decreased from 10,000 to 8,000. what is the percentage decrease.

$$\therefore \text{decrease \%} = \frac{10000 - 8000}{10000} \times 100$$

$$= \frac{2000}{10000} \times 100$$

% decrease = 20%.

g) A book's price drops from ₹ 500 to ₹ 400. what is the percentage decrease?

$$\text{decrease \%} = \frac{\text{Old} - \text{New}}{\text{Old}} \times 100$$

$$= \frac{500 - 400}{500} \times 100$$

$$= -\frac{100}{500} \times 100$$

$$= -\underline{\underline{20\%}}$$

minus sign shows decrease in percentage.

10] cost price is ₹ 600 & selling price is ₹ 450. loss %?

$$\text{Loss \%} = \frac{\text{New} - \text{old}}{\text{old} (\text{CP})} \times 100$$

$$= \frac{450 - 600}{600} \times 100$$

$$= -\frac{150}{600} \times 100$$

Loss \% = -25%.

loss = 25%.

- 11) Which is greater; 30% of 400 or 40% of 300.
- $$30 \times 400 = 120$$
- $$40 \times 300 = 120$$
- \therefore both are equal.
- 12] A person spends 60% of his income and saves ₹ 8000. What is his total income?
- 60% spends of income.
- Remaining; 40% = 8000
- equate $\therefore \frac{40}{100}x = 8000$
- $$\therefore x = 8000 \times \frac{100}{40}$$
- $$= 2000 \times 10$$
- $$x = 20,000$$
- Total income = 20,000.
- 13] If A is 20% more than B is how much less than A?
- $\therefore A$ is 20% more than B
- $$\therefore A + 20\% = B$$
- $$\therefore A = 120 \quad B = 100$$
- $$\therefore = \frac{20}{120} \times 100$$
- $$= 3.33 \times 5$$
- $$B = 16.65 \text{ less than A.}$$
- 14] If the price of sugar is increased by 25%, by how much should the consumption be reduced to maintain the same expense?
- $$100 \xrightarrow{+25\%} 125$$
- $$\therefore \frac{25}{125} \times 100 = \frac{1}{5} \times 100$$
- $$= 0.2 \times 100$$
- $$= 20\%$$
- 15] If A's income is 40% more than B's income, then B's income is what percentage less than A's?
- A $\xrightarrow{\text{more}} B$
- $$\therefore 100 \xrightarrow{40\%} 140 \sim A$$
- $$\therefore \frac{40}{140} \times 100$$
- $$= \frac{2}{7} \times 100$$
- $$= 2 \times 14.28$$
- B = 28.57% is less than A's income.

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

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

$$120 \xrightarrow{10\% \downarrow} 108$$

$$\frac{10}{120} \times 100 \therefore \text{change}$$

$$= \frac{0.08 \times 100}{100} = (108 - 100)$$

$$= 8\%$$

$$\therefore \frac{8}{100} \times 100 = 8\%$$

Ans: 8% increase.

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

$$100 \xrightarrow{30\% \uparrow} 130 \xrightarrow{20\% \downarrow}$$

$$20 \times 130 = 26.$$

$$\therefore \text{change} = (130 - 26) \\ = 104$$

$\therefore \therefore$ Final change in %.

$$= (104 - 100) = 4\%$$

\therefore increase.

\therefore 104 greater than 100 then $4\% \uparrow$

18] If the population of a city increased by 25% and then decreases by 20%, what is the net percentage change?

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

$$125 \xrightarrow{20\% \downarrow} 25$$

$$20 \text{ of } 125$$

$$= \frac{20}{100} \times 125$$

$$= \frac{20}{100} \times 5 = 25$$

$$\therefore \text{change} = (125 - 25) \\ = 100.$$

$$\text{Net change} = (100 - 100) \\ = 0\%.$$

19] If a price increases by 40% and then decreases by 30%, the final change is:

$$100 \xrightarrow{40\% \uparrow} 140 \xrightarrow{30\% \downarrow}$$

$$30\% \text{ of } 140$$

$$= 42.$$

$$\therefore \text{change} = (140 - 42) \\ = 98.$$

$$\text{Net change} = (100 - 98) \\ = 2\% \text{ decrease.}$$

20] The salary of a person is first increased by 20% and then decreased by 10%. What is percentage change.

$$\rightarrow 100 \xrightarrow{20\%} 120 \xrightarrow{10\% \downarrow} 108$$

$$108 \times 120 = 108.$$

$$\therefore \text{change} = (120 - 108) \\ = 108.$$

$$\text{Overall change} = (108 - 100) \\ = 8\% \uparrow$$

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

$$\text{CP} \xrightarrow{25\% \uparrow} \text{S.P.}$$

$\therefore \text{Selling price \% of C.P.} = ?$

$$\therefore \frac{\text{S.P.}}{\text{C.P.}} \times 100$$

$$= \frac{125}{100} \times 100$$

$$= 125\%$$

22] A shopkeeper allows a discount of 10% on the marked price and still makes a profit of 8% if the marked price is ₹ 500, what is the cost price?

$$\text{discount} \\ 500 \xrightarrow{+10\%} 50.$$

$$500 \times \frac{10}{100} = 50.$$

$$\therefore \text{Discounted price} \\ \text{become} = 500 - 50 \\ = \underline{\underline{450}}$$

$$\therefore 450 \xrightarrow{8\% \text{ Profit}}$$

8% of 450

$$\frac{8}{100} \times 450 = 32$$

$$\therefore 450 - 32 = 418.$$

$$\therefore \approx 420 \text{ ₹}$$

⑤ If the profit is 20% of the cost price, then what is the profit percentage on the selling price?

$$\text{Let, } \begin{array}{ccc} \text{C.P} & \xrightarrow{\text{Profit}} & \text{S.P} \\ & 20\% & \\ 100 & \rightarrow & 120 \end{array}$$

$$\therefore \frac{20}{S.P} \times 100 = \text{Profit \% on S.P.}$$

$$\therefore \frac{120}{100} \times 5 =$$

$$= 3.33 \times 5$$

$$\approx 16.67\%$$

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

$$M.P = 1200 \quad S.P = 960$$

$$\text{Profit of } ₹ = (1200 - 960) \\ = 240 \text{ on M.P.}$$

$$= \frac{240}{S.P} \times 100$$

$$= \frac{240}{1200} \times 100$$

$$\text{discount} = 20\%$$

⑥ 25] If an article is bought for ₹ 500 and sold for ₹ 650, what is the percentage profit?

$$C.P = 500 \quad S.P = 650$$

$$\therefore \frac{(650 - 500)}{500} \times 100$$

$$(650 - 500) = 150$$

$$= 150 \text{ on } 500$$

$$\therefore = \frac{150}{500} \times 100$$

$$= 30\% \text{ profit.}$$

26] If A's income is 20% more than B's, then B's income is what percentage less than A's?

$$A + 20\% = B$$

$$100 \xrightarrow{20\% \uparrow} 120 \\ B \qquad \qquad \qquad A$$

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

less than A's income.

27] If the ratio of boys to girls in a school is $3:2$, what percentage of the total students are boys?

boys to girls
 $\frac{3}{3+2}$

$$\text{total} = 3+2=5.$$

$$\therefore \frac{3}{5} \times 100.$$

$= 3 \times 20 = 60\%$ of the total students are Boys.

28] A city's population from 200000 to 250000 in 2 years. What is the percentage increase.

$$\therefore 250000 - 200000 \\ = 50000$$

$$= \frac{50000}{200000} \times 100$$

$= 25\%$ increase.

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

65% for a candidate ①

Remaining $100-65=35$

35% to candidate ②

$$\therefore 65-35=30\% \text{ i.e.}$$

he wins by 30% votes of x , which equals to 3000

$$\therefore 30\% x = 3000.$$

$$\frac{30}{100} x = 3000$$

$$x = 3000 \times \frac{100}{30}$$

$$x = 100 \times 100$$

$x = 10000$ total votes

30] The price of an article is reduced by 30%.

By what percentage must the new price be increased to restore the original price?

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

Reduced price.

$\therefore 30\% \text{ of } 70.$

$$\frac{30}{100} \times 100 = 4.28 \times 10$$

$= 42.85\%$ must increase to restore.

7

31] If a number is increased by 50% and then decreased by 50%. what is the net percentage change?

$$100 \xrightarrow{50\% \uparrow} 150 \xrightarrow{-50\%}$$

50% of 150.

$$50 \times 150 = 75$$

$$\text{Net \% change} = (100 - 75)$$

decrease = -25%.

32] If A is 20% taller than B, [is shorter than A by;

$$100 \xrightarrow{\substack{\text{taller} \\ 20\%}} 120 \quad \begin{matrix} \\ \text{A} \end{matrix}$$

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

B is 16.67% shorter than A.

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

$$30\% \text{ of } x = 90$$

$$60\% \text{ of } x = ?$$

$$\frac{30}{90} = \frac{60}{x} \quad \therefore x = 60 \times \frac{90}{30}$$

$$\underline{\underline{x = 180}}$$

33]

OR

$$30\% \text{ of } x = 90$$

$$\frac{30}{100} \times x = 90$$

$$x = 90 \times \frac{100}{30}$$

$$\text{Same No. } x = 300$$

$\therefore 60\% \text{ of same no. } x$.

$$\therefore 60\% \text{ of } 300$$

$$\therefore \frac{60}{100} \times 300$$

$$= \underline{\underline{180}}$$

34] A person spends 75% of his income and saves £ 5000. what is his total income?

spends = 75%.

$$100 - 75 = 25\%$$

25% = 5000. saves

$$25\% \text{ of } x = 5000$$

$$\therefore \frac{25}{100} \times x = 5000$$

$$x = 5000 \times \frac{100}{25}$$

$$= 200 \times 100$$

total income =

$$\underline{\underline{x = 20,000}}$$

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

$$\begin{aligned}
 & 100 \xrightarrow{20\% \uparrow} 120 \\
 & = \frac{20 \text{ (increase)}}{100 + \text{increase}} \times 100 \\
 & = \frac{20}{100+20} \times 100 \\
 & = \frac{20}{120} \times 100 = 16.67.
 \end{aligned}$$

36) The price of a T.V. was first increased by 20% and then decreased by 10%. What is the overall % change?

$$\begin{aligned}
 & 100 \xrightarrow{20\% \uparrow} 120 \xrightarrow{10\% \downarrow} \\
 & 10\% \text{ of } 120 \\
 & = \frac{10}{100} \times 120 = 12
 \end{aligned}$$

$$\begin{aligned}
 \text{overall change} &= 120 - 12 \\
 &= 108.
 \end{aligned}$$

$$\begin{aligned}
 \therefore \% \text{ overall change} &= \\
 &= \frac{108 - 100}{100} \times 100 \\
 &= \frac{8}{100} \times 100 \\
 &= 8\% \text{ increase.}
 \end{aligned}$$

37] A shopkeeper marks an item 25% above the cost price and gives a 20% discount. What is his profit/loss percentage?

$$\begin{aligned}
 & \text{C.P} \xrightarrow{25\% \uparrow} 125 \\
 & \quad 20\% \text{ on } 125 \\
 & \therefore \frac{20}{100} \times 125 = \frac{125}{5} \\
 & \quad = \text{£} 25 \text{ discount.} \\
 & (125 - 25) = 100 \\
 & \therefore \text{C.P} = \text{S.P.} \\
 & \therefore 0\% \rightarrow \text{profit/loss}
 \end{aligned}$$

38) If the cost price of an article is £ 500 and it is sold at a loss of 20%. Then what is the selling price?

$$\begin{aligned}
 & \text{C.P} \xrightarrow{\text{Loss } 20\% \downarrow} \\
 & \frac{20}{100} \times 500 = 100 \\
 & \therefore 500 - 100 = 400 \\
 & \quad \text{C.P} \quad \text{loss price} \quad \text{S.P.}
 \end{aligned}$$

$$\therefore \text{S.P} = \underline{\underline{400}}$$

39] If a salary is increased by 10% and then decreased by 10%, what is the final % change?

$$100 \xrightarrow{10\% \uparrow} 110 \xrightarrow{-10\%}$$

salary

$$\frac{10}{100} \times 100 = 11.$$

$$(100 - 11) = 99.$$

$$\therefore \text{change \%} = (100 - 99) \\ = 1 \% \text{ decrease.}$$

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

$$(200 + 20) = 40\%$$

$$220 = 40\%$$

$$\therefore \text{total marks} = 100\%$$

$$\frac{220}{40} \times 100 = 55 \times 10$$

$$\text{Total marks} = 550$$

⑩ 41] A man spends 20% of his salary on rent, 30% on food, and 10% on transport. If he saves ₹ 18000 what is his salary?

$$20\% + 30\% + 10\% = 60\% \quad \text{Spends}$$

$$\text{total \%} = 100\%$$

$$\therefore \text{Remain \%} = 100 - 60 = 40$$

$$40\% = 18000$$

$$40\% \text{ of } x = 18000$$

$$\frac{40}{100} \times x = 18000$$

$$x = \frac{18000}{40} \times 100$$

$$x = 4500 \times 10$$

$$\text{Salary} = 45,000.$$

42] The cost of an item is first increased by 30% and then decreased by 30%. What is the overall % change?

$$100 \xrightarrow{30\%} 130 \xrightarrow{-30\%}$$

$$30\% \text{ of } 130$$

$$\frac{30}{100} \times 130 = 39.$$

$$130 - 39 = 91$$

$$\therefore \text{overall change} = (100 - 91)$$

$$\text{decrease} = 9\%.$$

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?

① 1st year

$$10000 \xrightarrow{+10\%} 11000$$

$$\frac{10}{100} \times 10000 = 1000 \\ + 10000 \\ = 11000$$

② $11000 \xrightarrow{+10\%}$

$$\frac{10}{100} \times 11000 = 1100$$

$$11000 + 1100 = 12100$$

③ $12100 \xrightarrow{+10\%}$

$$\frac{10}{100} \times 12100 = 1210$$

$$12100 + 1210$$

After 3 years = 13310
population

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

$$15\% \text{ of } A = 20\% \text{ of } B.$$

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

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

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

$\therefore A:B \text{ is } 4:3.$

11) 45] If the cost price of an item is 800 and the profit made is 25%. what is the selling price?

$$\begin{array}{rcl} \text{C.P} & & \text{Profit} \\ 800 & \xrightarrow{25\% \uparrow} & \end{array}$$

$$\frac{25}{100} \times 800 = 200$$

$$\therefore S.P = 800 + 200$$

$$\therefore S.P. = 1000$$

46] If the cost price of an item is ₹ 200 and the selling price ₹ 250 what is the profit %.

$$C.P = 200 \quad S.P = 250.$$

$$\begin{aligned} P &= \frac{\text{change}}{\text{C.P}} \times 100 \\ &= \frac{250 - 200}{200} \times 100 \\ &= \frac{50}{200} \times 100 = 25\% \end{aligned}$$

47] A man sells an article for ₹ 720 at a profit of 20%. Find the C.P.

$$S.P = 720 \quad \text{profit} = 20\%$$

$$\text{let, } 100 \xrightarrow[C.P]{20\% \text{ on}} 120 \xrightarrow[S.P]{\text{S.P}}$$

$$\frac{120}{100} \times 100 = 120 \text{ ₹}$$

Profit on

$$(720 - 120) = \underline{\underline{580}}$$

$$C.P = 600$$

48] A shopkeeper sells an item at a loss of 15%. If the cost price is 500 find the S.P.

$$C.P = 500 \xrightarrow{\downarrow 15\%} 450$$

$$\frac{15}{100} \times 500 = 75 \\ (500 - 75) = 425 \\ S.P = 425$$

49] A man purchased a cycle for ₹ 1500 and sold it at the a loss of 10%. what was the S.P?

$$C.P = 1500 \xrightarrow{\text{loss} \downarrow 10\%} \\ \frac{10}{100} \times 1500 = 150$$

$$\therefore S.P = 1500 - 150$$

$$S.P. = 1350$$

50] A trader marks his goods at 30% above the cost price and allows a discount of 10%. what is his gain percent? (12)

$$C.P \quad 100 \xrightarrow{\uparrow 30\%} 130 \xrightarrow{\downarrow 10\%} \text{discount}$$

$$\therefore \frac{10}{100} \times 130 = 13.$$

$$\therefore \text{gain} = 130 - 13 = 117.$$

$$\therefore \text{gain} = \frac{\text{change}}{C.P} \times 100$$

$$\% \text{ gain} = \frac{117}{100} = 117$$

$$\text{gain} = \underline{\underline{17\%}}$$