

Topic : Percentage & Profit & Loss

① What is 25% of 200?

- a) 25
- b) 50
- c) 75
- d) 100

Ans:- b) 50

$$25\% = \frac{25}{100} \times 200 = \frac{5000}{100} = 50$$

② If 40% of number is 80, what is the no?

→ ans - c) 200

$$40\% = \frac{40}{100} = 0.4$$

$$\therefore 0.4 \times X = 80$$

$$\therefore X = \frac{80}{0.4} = 200$$

③ 75% of a number is 150. What is the number?

→ ans - b) 200

$$\therefore 75\% = \frac{75}{100} = 0.75$$

$$\therefore 0.75 \times x = 150$$

$$\therefore x = \frac{150}{0.75} = 200$$

④ What is 15% of 120?

→ c) 18

$$\therefore 15\% = \frac{15}{100} = 0.15$$

$$\therefore 0.15 \times 120 = 18.$$

- (5) If 30% of a number is 90, then the number is
 → c) 300

$$\therefore 30\% = \frac{30}{100} = 0.30$$

$$\therefore 0.30 \times x = 90$$

$$\therefore x = \frac{90}{0.30} = 300$$

- (6) The price of a product increases from ₹200 to ₹250
 what is percentage increase?
 → ans - b) 25%.

$$\therefore \text{old price} = ₹200$$

$$\text{new price} = ₹250$$

$$\text{Increase} = 250 - 200 = 50$$

∴

$$\% \text{ increase} = \left(\frac{50}{200} \right) \times 100$$

$$= \frac{50 \times 100}{200} = \frac{5000}{200} = 25\%$$

- (7) A salary increases from ₹40000 to ₹50000
 what is the percentage increase?

- ans - b) 25%.

~~salary~~

$$\therefore \text{old price} = ₹40000$$

$$\text{new salary} = ₹50000$$

$$\text{Increase} = ₹10000$$

$$\therefore \% \text{ increase} = \left(\frac{10000}{40000} \right) \times 100$$

$$= 25\%$$

⑧ The population of a town decreased from 10000 to 8000 what is the percentage decreased?

→ ans - c) 20%.

$$\therefore \text{old population} = 10000 \\ \text{new population} = 8000$$

$$\% \text{ Decrease} = \frac{(2000)}{10000} \times 100 \\ = 20\%.$$

⑨ A book's price drops from ₹500 to ₹400 what is the % decrease?

→ ans - c) 20%.

$$\therefore \text{old price} = ₹500 \\ \text{new price} = ₹400 \\ \text{decrease} = ₹100$$

$$\therefore \text{Decrease} : \frac{100}{500} \times 100 \\ = 20\%.$$

⑩ If the cost price of an item is ₹600 & selling price is ₹450. What is the percentage loss?

→ ans - c) 25%.

$$\therefore \text{cost price} = ₹600 \\ \text{Selling price} = ₹450 \\ \text{Loss} = ₹150$$

$$\% \text{ Loss} = \frac{150}{600} \times 100 \\ = 25\%.$$

Percentage Comparison

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

→ c) Both are equal

$$30\% \text{ of } 400 = \frac{30}{100} \times 400$$

$$= 0.30 \times 400$$

$$= 120$$

$$40\% \text{ of } 300 = \frac{40}{100} \times 300$$

$$= 0.40 \times 300$$

$$= 120$$

(12) A person spends 60% of his income and saves ₹ 8000. What is his total income?

→ → c) 20000

$$\because 40\% \text{ of income} = ₹ 8000$$

$$1\% \text{ of income} = ₹ 8000 \div 40 \\ = ₹ 200$$

$$100\% \text{ of income} = ₹ 200 \times 100 \\ = ₹ 20000.$$

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

→ ans - b) 16.67%.

$$\therefore A = B + 20\% \text{ of } B$$

$$A = 120$$

$$\text{If } B = 100$$

$$\text{how much B is less than A} = \frac{\text{Diff.}}{A} \times 100$$

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

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

→ a) 20%.

$$\text{old price} = 100$$

$$\text{new price} = 125$$

$$\text{diff} = 25$$

$$\therefore \frac{25}{125} \times 100$$

$$= 20\%$$

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

→ a) 28.57%.

∴ A is 40% more than B

$$B = 100$$

$$A = 140$$

$$\therefore C = \frac{40}{140} \times 100 = 28.57\%$$

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

→ 8% increase

$$a = 20\% \uparrow$$

$$b = -10\% \downarrow$$

$$\text{Net change} = 20 + (-10) + \frac{20 \times (-10)}{100}$$

$$= 20 - 10 + \frac{-200}{100}$$

$$= 20 - 10 - 2$$

= 8% increase

(17) A number is increased by 30%, and then decreased by 20%. What is final percentage change?

→ a) 4% increase

$$a = 30\%, \uparrow$$

$$b = -20\%, \downarrow$$

$$\text{Net change} = 30 + (-20) + \frac{30 \times (-20)}{100}$$

$$= 30 - 20 - 6$$

$$= 4\%, \uparrow$$

(18) If the population of a city increases by 25% & then decreases by 20%. What is net % change?

→ b) 5% change

$$a = 25\%$$

$$b = 20\%$$

$$\text{Net change} = 25 + (-20) + \frac{25 \times (-20)}{100}$$

$$= 25 - 20 - 5$$

$$= 5\%, \uparrow$$

(19) If a price ↑ by 40% & then ↓ by 30%. final change is

→ b) 10% increase

$$a = 40\%, \uparrow$$

$$b = -30\%, \downarrow$$

$$\text{Net change} = 40 + (-30) + \frac{40 \times (-30)}{100}$$

$$= 40 - 30 - 12$$

$$= 10\%, \uparrow$$

- 20) The salary of a person is first increased by 20% & then decreased by 10%. What is overall % change?
 → a) 8% Increase

$$a = 20\%, \uparrow$$

$$b = -10\%, \downarrow$$

$$\text{Net change} = 20 + (-10) + \frac{20 \times (-10)}{100}$$

$$= 20 - 10 - 2$$

= 8% increase

- 21) If an article is sold at profit of 25%. Then the selling price is what % of cost price?

- b) 125% of CP

$$\text{Selling Price} = \text{Cost Price} + \text{Profit}$$

$$SP = CP + 25\% \text{ of } CP$$

$$SP = CP \times \left(1 + \frac{25}{100}\right)$$

$$SP = CP \times 1.25$$

$$SP = 125\% \text{ of } CP$$

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

- a) €420

$$\text{Selling Price} = MP - \text{Dis.}$$

$$\text{Dis} = \frac{10}{100} \times 500 = 50$$

$$SP = 500 - 50 = 450$$

$$\therefore SP = CP + 8\% \text{ of } CP$$

$$450 = CP \times \left(1 + \frac{8}{100}\right)$$

$$CP = \frac{450}{1.08} = 416.67 \approx 420$$

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

→ a) 16.67%

$$\therefore \text{Profit} = 20\% \text{ of CP}$$

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

$$SP = CP + \text{Profit}$$

$$= 100 + 20 = 120$$

$$\text{Profit \%} = \left(\frac{20}{120} \right) \times 100 = 16.67\%$$

(24) A product is marked at ₹1200 & sold for ₹960 what is % discount given?

→ Dis. = MP - SP

$$= 1200 - 960 = 240$$

$$\text{D.B.\%} = \left(\frac{\text{Dis}}{\text{MP}} \right) \times 100$$

$$= \left(\frac{240}{1200} \right) \times 100$$

$$= 20\%.$$

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

→ c) 30%

$$\text{Profit} = SP - CP$$

$$= 650 - 500$$

$$= 150$$

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

$$= \left(\frac{150}{500} \right) \times 100$$

$$= 30\%.$$

(26) If A's income is 20% more than B's income is what % less than A's?

→ a) 16.67%.

$$B = ₹100$$

$$A = 20\% B$$

$$= 100 + 20$$

$$= 120$$

$$\therefore \% \text{ A to B} = \left(\frac{A - B}{A} \right) \times 100$$

$$= \left(\frac{120 - 100}{120} \right) \times 100$$

$$= 16.67\%.$$

(27) If ratio of boys to girls in a school is 3:2 what % of total students are boys?

→ d) 60%.

Total no of students $3+2=5$

$$\text{Boys} = \frac{3}{5} \text{ of total}$$

$$\therefore \left(\frac{3}{5} \right) \times 100 = 60\%.$$

(28) A city's population increased from 200000 to 250000 in 2 years what is the percentage increase?

$$\text{Increase} = 250000 - 200000$$

$$= 50000$$

$$\therefore \% = \left(\frac{\text{Increase}}{\text{Org. Po.}} \right) \times 100$$

$$= \left(\frac{50000}{200000} \right) \times 100$$

$$= 25\%.$$

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

→ total votes - x

winning candidate - 65% of x

losing - 35% of x

$$\text{diff.} = 65\% - 35\% = 30\% \text{ of } x$$

$$\therefore 30\% \text{ of } x = 3000$$

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

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

$$\text{Ans} - x = 10,000$$

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

→ Original Price = 100

$$30\% \downarrow = 100 - 30 = 70$$

$$100\% = 70 + x\% \text{ of } 70 = 100$$

$$= 70 + \frac{x}{100} \times 70 = 100$$

$$\frac{x}{100} \times 70 = 30$$

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

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

→ b) 25% decrease

$$\text{Net change} = \frac{a+b+ab}{100}$$

$$a = 50\%, 9$$

$$b = -50\%$$

$$= 50 - 50 + \frac{50 \times (-50)}{100}$$

$$= -25\% \text{ (decrease)}$$

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

→ a) 16.67%.

$$B \text{ height} = 100$$

$$A \text{ height} = 100 + 20 = 120$$

$$\frac{B\% \text{ shorter than } A}{A} = \left(\frac{A-B}{A} \right) \times 100$$

$$= \left(\frac{120 - 100}{120} \right) \times 100$$

$$= 16.67\%.$$

(33) If 30% of a number is 90, what is 60% of same no?

→ c) 180

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

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

$$x = \frac{90 \times 100}{30} = 300$$

60% of x

$$\frac{60}{100} \times 300 = 180$$

(34) A person spends 75% of his income & saves ₹ 5000. What is his total income?

→ c) ₹ 20000

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

$$x = \frac{5000 \times 100}{25} = 20,000$$

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

→ a) 16.67%.

$$\begin{aligned}\text{Req. Reduction} &= \frac{1 \times 100}{1 + 100} \\ &= \frac{20 \times 100}{20 + 100} \\ &= \frac{2000}{120} = 16.67\%\end{aligned}$$

(36) The price of a TV was first increased by 20% & then decreased by 10%. What's the overall percentage change?

→ a) 8% increase

$$a = 20\%$$

$$b = 10\%$$

$$\text{Net Change} = a + b + \frac{a \times b}{100}$$

$$= 20 - 10 + \frac{20 \times (-10)}{100}$$

= 8% increase

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

$$\rightarrow CP = ₹100$$

$$MP = 25\% \text{ of } CP = ₹125$$

SP after 20% dis.

$$SP = 125 - \left(\frac{20}{100} \times 125 \right)$$

$$= 125 - 25$$

$$= ₹100$$

$$\text{Profit/Loss} = SP - CP$$

$$= ₹100 - ₹100$$

$$= 0\%$$

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

$$\rightarrow c) ₹400$$

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

$$= 500 - (20\% \times 500)$$

$$= 500 - 100$$

$$= ₹400$$

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

$$\rightarrow b) 1\% \text{ change } a = +10\% \uparrow \\ b = -10\% \downarrow$$

$$\text{Net change} = 10 - 10 + \left(\frac{10 \times (-10)}{100} \right)$$

$$= 10 - 10 - 1$$

$$= -1\%$$

(Q)

A student needs 40% marks to pass. He gets 200 mks & fails by 20 marks. What are the total marks

→

b) 550 X be total marks

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

He gets 200 need 20 more

$$\text{Passing mks} = 220$$

$$40\% \text{ of } x = 220$$

$$x = \frac{220 \times 100}{40} = 550$$

(Q)

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

→

Total = 60%, Spends

40% of saving of salary

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

$$x = \frac{18000 \times 100}{40} = 45000$$

b) 45000

(Q)

The cost of an item is first ↑ by 30%, & then ↓ by 30%. Overall % change?

→

$$a = 30\% \uparrow$$

$$b = -30\% \downarrow$$

$$\% \text{ change} = a + b + \frac{ab}{100}$$

b) 9% ↓

$$= 30 - 30 + \frac{30 \times (-30)}{100}$$

$$= -9\%$$

(43) The population of a town increases by 10% every year if the current population is 10000 what will be after 3 years?

→ $X = 10000 \quad a = 10\% \quad t = 3$

$$\text{Final population} = X \times \left(1 + \frac{a}{100}\right)^t$$

a) 13310

$$= 10000 \times (1.1)^3$$

$$= 10000 \times 1.331$$

$$= 13,310.$$

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

→ b) 4:3

$$15\% \times A = 20\% \times B$$

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

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

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

→ b) £1000

$$SP = CP + \text{Profit}$$

$$= CP \times \left(1 + \frac{\text{Profit \%}}{100}\right)$$

$$= 800 \times 1.25$$

$$= 1000$$

(46) If the cost price of an item is ₹200 & selling price is ₹250 what is the profit %?
→ b) 25%.

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

$$= \left(\frac{250 - 200 \times 100}{200} \right)$$

$$\Rightarrow \frac{50}{200} \times 100 = 25\%$$

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

- a) ₹600

$$CP = \underline{SP}$$

$$\frac{1 + \text{Profit \%}}{100}$$

$$= \frac{720}{1.2}, 600$$

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

- b) ₹425

$$SP = CP \times \left(1 - \frac{\text{Loss \%}}{100} \right)$$

$$= 500 \times (1 - 0.15)$$

$$= 425$$

(49) A man purchased a cycle for ₹1500 & sold it at a loss of 10%. What was selling price?

→ c) ₹ 1350

$$SP = CP \times \left(1 - \frac{\text{loss}\%}{100}\right)$$

$$= 1500 \times (1 - 0.10)$$
$$= 1350$$

(50) A trader marks his goods at 30% above CP & allows a discount of 10%. What is his gain percent?
→ a) 17%.

$$CP = 100$$

$$MP = 130$$

$$SP = 130 \times 0.90 = 117$$

$$\text{Gain}\% = \frac{117 - 100}{100} \times 100$$

$$= 17\%$$