

Assignment - 1

Topic :- percentage & profit & loss - 21 medium

1 what is 25% of 200? Ans

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

$$= 50 \text{ Ans}$$

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

$$= \frac{40}{100} \times 80 = 32.0$$

$$80 = 0.4x = 80$$

$$0.4x = 80$$

$$x = \frac{80}{0.4} = 200$$

Ans

(3) If 40% of a number is 150, what is the number.

$$0.4x = 150$$

$$\text{for } x = \frac{15000}{0.75} = \frac{50000}{25}$$

number is = 200 Ans.

(4) what is 15% of 120?

$$= \frac{15}{100} \times 120 = 18$$

(5) If 30% of a number is 90 then the number is?

$$0.3x = 90 \\ x = \frac{90}{0.3}$$

$$x = 300 \text{ Ans}$$

(1) The price of a product increase from 200Rs to 250Rs. What is the percentage increase?

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

$$\frac{50 - 20}{20} \times 100$$

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

- (7) A salary increases from 40000 Rs to 50000 Rs. What is the percentage increase?

$$\text{percentage Increase} = \frac{50000 - 40000}{40000} \times 100$$

$$= \frac{10000}{40000} \times 100 \\ = 250 \\ = 25\%$$

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

$$\text{percentage decrease} = \left(\frac{10000 - 8000}{10000} \right) \times 100$$

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

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

(9) A book's price drops from 500Rs to 400Rs what is the percentage decrease?

$$\text{percentage Decrease} = \left(\frac{500 - 400}{500} \right) \times 100$$

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

$$= 20\%$$

(10) If the cost price of an item is 600Rs and the selling price is 450Rs. what is the percentage loss?

$$\text{percentage loss} = \frac{\text{CP} - \text{SP}}{\text{CP}} \times 100$$

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

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

$$= 25\%$$

(1) What is greater: 30% of 400
or 40% of 300

(1) 30% of 400

$$\frac{30}{100} \times 400 = 120$$

(2) 40% of 300

$$\frac{40}{100} \times 300 = 120$$

(2) A person spends 60% of his income and saves \$8000. What is his total income?

$$40\% \text{ of } x = 8000$$

$$0.4x = 8000$$

$$x = \frac{8000}{0.4}$$

$$x = 20,000 \text{ Ans}$$

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

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

$$A = B + 0.2B$$

$$= 1.2B$$

percentage decrease = $\frac{A-B}{B} \times 100$

$$= \frac{1.2B - B}{1.2B} \times 100$$

$$= \frac{0.2B}{1.2B} \times 100$$

$$= \frac{0.2}{1.2} \times 100$$

$$= \frac{200}{120}$$

$$= 16.67\%$$

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

$$\text{Expense} = \text{price} \times \text{quantity}$$

$$\text{New price} = 1.25p$$

$$p \times c = 1.25p \times c$$

$$= 25\% \text{ less}$$

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

$$A = x + 40\% \text{ of } x$$

$$= x + 0.4x$$

$$= 1.4x$$

$$\text{percentage decrease} = \frac{(A - B)}{A} \times 100$$

$$= \frac{1.4x - x}{1.4x} \times 100$$

$$= \frac{0.4x}{1+4x} \times 100 \\ = \frac{400}{14}$$

~~minimum value = 28.57% range~~

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

$$\text{percentage} = a + b + \frac{ab}{100} \\ = 20 - 10 + \frac{(20 \times 10)}{100}$$

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

= 8% increase

R.P.I. =

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

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

$$= 30 - 20 + \frac{30 \times -20}{100}$$

$$= 10 - \frac{600}{100}$$

$$= 10 - 6$$

= 4 % increase

- (18) If the solution of a city increase by 25% and decrease by 20%. what is the net percentage change?

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

$$= 25 + 20 + \frac{25 \times -20}{100}$$

$$= 25 - 20 - \frac{500}{100}$$

$$= 5 - 5$$

= 0% change

(9) If a price increases by 40% and then decreases by 30%. The final change is

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

$$= 40 - 30 + \frac{40 \times -30}{100}$$

$$= 10 - \frac{120}{100}$$

= -20% decrease

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

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

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

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

= 8% increase

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

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

$$\begin{aligned} SP &= (CP + 0.25 CP) \\ &= 1.25 (CP) \end{aligned}$$

$$SP = 125\% \cdot CP \quad \text{Ans}$$

(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 rs what is the cost price

$$SP = MP - (10\% \text{ of } MP)$$

$$SP = 500 - (0.10 \times 500)$$

$$= 500 - 50$$

$$= 450$$

$$0.08 = 12\% \text{ of } 500$$

$$12\% = 12\% \text{ of } 500$$

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

$$\text{Profit} = 0.2 \times \text{CP}$$

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

$$= CP + 0.2 \times CP$$

$$SP = 1.2 \times CP$$

$$\text{Profit percentage} = \frac{\text{Profit}}{SP} \times 100$$

$$= \frac{0.2 \times CP}{1.2 \times CP} \times 100$$

$$(0.2 \times 100) - 20 = \frac{20}{12} \times 100 = 16.67$$

$$(100 \times 100) - 83 = 16.67$$

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

$$\text{Marked price} = 1200$$

$$\text{Selling price} = 960$$

$$\begin{aligned}\text{discount} &= \text{mp} - \text{sp} \\ &= 1200 - 960 \\ &= 240\end{aligned}$$

$$\begin{array}{r} 240^2 \\ \times 100 \\ \hline 24000 \\ = 20\% \text{ Ans.} \end{array}$$

Q) If an article is bought for 500rs and sold for 650rs. What is the percentage profit.

$$\begin{array}{l} \text{cost price} = 500 \text{ rs} \\ \text{selling price} = 650 \text{ rs} \end{array}$$

$$\text{profit} = \text{sp} - \text{cp}$$

$$\text{sp} = 650 - 500$$

$$150$$

$$\text{profit \%} = \frac{150}{500} \times 100$$

$$= 30\% \text{ Ans}$$

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

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

$$= B + 0.2B$$

$$A = 1.2B$$

percentage decrease = $\frac{A - B}{A} \times 100$

$$= \frac{1.2B - B}{1.2B} \times 100$$

$$= \frac{0.2B}{1.2B} \times 100$$

$$= \frac{20}{120} \times 100 \\ = \frac{200}{120} \\ = \frac{200}{12}$$

$$= 16.67 \text{ Ans}$$

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

$$3+2 = 5$$

percentage of boys = $\frac{3}{5}$

per convert to percentage = $\frac{3}{5} \times 100^0$

$$= 120$$

$$= 60\% \text{ Ans}$$

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

$$\text{percentage population} = \frac{250,000 - 200,000}{2,00,000} \times 100$$

$$= \frac{50,000}{2,00,000} \times 100$$

$$= 25\% \text{ Ans}$$

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

$$65\% \text{ of } x - 35\% \text{ of } x = 3000$$

$$0.65x - 0.35x = 3000$$

$$0.30x = 3000$$

$$x = \frac{3000}{0.3}$$

$$x = 10000 \text{ Ans}$$

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

$$\text{New price} = 100 - (30\% \text{ of } 100)$$

$$= 100 - 30$$

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

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

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

$$70x = 3000$$

$$\% \Delta = \frac{30 \times 100}{70}$$

$$\% \Delta = \frac{3000}{70} = 42.8$$

$$\% \Delta = 42.86 \text{ %.}$$

(31) If a number is increased by 50% and then decreased by 50%. What is the net percentage change?

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

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

$$\% \Delta = \frac{-2500}{100}$$

= -25.1% decrease

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

$$\begin{aligned} A &= B + 20\% \text{ of } B \\ &= B + 0.2B \\ &= 1.2B \end{aligned}$$

$$\text{percentage decrease} = \left(\frac{A - B}{B} \right) \times 100$$

$$= \frac{1.2B - B}{1.2B} \times 100$$

$$= \frac{0.2B}{1.2B} \times 100$$

$$= \frac{200}{12} 16.67$$

$$= 16.67\% \quad \checkmark \text{Ans}$$

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

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

$$0.3x = 90$$

$$x = \frac{90}{0.3}$$

$$x = 300$$

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

$$0.6 \times 300 = 180 \quad \checkmark \text{Ans}$$

(34) A person spends 75% of his income and saves 5000Rs. What is his total income.

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

$$0.25x = 5000$$

$$x = \frac{5000}{0.25}$$

$$x = 20000 \text{ Ans}$$

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

$$\text{price} = 100 + 20\% \text{ of } 100$$

$$= 100 + 20$$

$$= 120$$

$$120 \times x = 10000$$

$$x = \frac{10000}{120} = 83.3$$

$$x = 83.33 \text{ Ans}$$

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

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

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

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

= 18% increase

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

assume cost price = 100

$$\text{marked price} = cp + 25\% \text{ of } cp$$

$$= 100 + 25$$

$$= 125$$

$$sp = mp - 20\% \text{ of } mp$$

$$= 125 - (0.20 \times 125)$$

$$\begin{aligned} SP &= 125 - 25 \\ &= 100 \end{aligned}$$

$$\begin{aligned} \text{profit/loss} &= SP - CP \\ &= 100 - 100 = 0 \\ &= 0\% \quad \underline{\text{Ans}} \end{aligned}$$

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

$$SP = CP - (\text{loss} \times CP)$$

$$SP = 500 - (0.20 \times 500)$$

$$SP = \frac{CP (100 - 20\%)}{100}$$

$$= \frac{500 (100 - 20\%)}{100}$$

$$= \frac{500 \times 80}{100}$$

$$= 400 \text{ Rs} \quad \underline{\text{Ans}}$$

(39) If a salary is increased by 10% and then decreased by 10%. What is the final percentage change?

$$\begin{aligned} \text{percentage change} &= a + b + \frac{ab}{100} \\ &= 10 - 10 + \frac{10 \times -10}{100} \\ &= 0 - \frac{100}{100} \\ &= -10\% \end{aligned}$$

$(92 \times 220) \div 100 = 0\%$ Ans

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

$$200 + 20 = 220$$

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

$$0.4x = 220$$

$$x = \frac{220}{0.4} 550$$

$$x = 550 \quad \underline{\text{Ans}}$$

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

$$\text{Salary} = x$$

$$\text{Rent} = 20\% \text{ of } x \rightarrow 0.2x$$

$$\text{Food} = 30\% \text{ of } x \rightarrow 0.3x$$

$$\text{Transport} = 10\% \text{ of } x \rightarrow 0.1x$$

$$\text{Savings} = 18000$$

$$x = 0.2x + 0.3x + 0.1x + 18000$$

$$x - 0.2x - 0.3x - 0.1x = 18000$$

$$x - 0.6x = 18000$$

$$0.4x = 18000$$

$$x = \frac{18000}{0.4} = 45000$$

$$x = 45000$$

$$(0.1 \times 45000) = 9$$

$$18000 + 9 = 18009$$

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

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

$$\begin{aligned} & 30 + -30 + 30 \times -30 \\ & = 30 - 30 + 30 \times -30 \\ & = 30 - 30 + \frac{900}{100} \\ & = 900 \times 0.01 = 9\% \text{ decrease} \end{aligned}$$

(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?

$$P = P_0 \times (1+\tau)^t$$

$$P_0 = 10000 \times 1.10^0 = 10000$$

$$\tau = 0.10$$

$$t = 3$$

$$P = 10000 \times (1.10)^3$$

$$P = 10000 \times 1.331$$

$$P = 13,810 \text{ Ans}$$

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

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

$$0.15A = 0.20B$$

$$A:B$$

divide both sides by 0.05 to

$$\frac{0.15A}{0.05} = \frac{0.20B}{0.05}$$

$$3A = 4B$$

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

$$= 4:3 \text{ Ans}$$

(5) If the cost price of an item is 800 rs and the profit made is 25%, what is the selling price.

$$SP = \frac{CP(100 + \text{Profit})}{100}$$

$$= \frac{800(100+25)}{100}$$

$$= \frac{800 \times 125}{100}$$

$$\begin{array}{r} 125 \\ \times 8 \\ \hline 1000 \end{array} \quad = 1000 \text{ Rs} \quad \underline{\text{Ans}}$$

(46) If the cost price of an item is 200rs and the selling price is 250rs what is the profit

$$\text{profit} \leftarrow \text{SP} - \text{CP}$$

$$= 250 - 200$$

$$\text{profit} = \frac{50}{250} \times 100$$

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

$$= \frac{50}{250} \times 100$$

$$= \frac{500}{25} \times 20$$

$$= 20 \times 10 \quad \underline{\text{Ans}}$$

(U7) A man sells an article for ₹ 720 and gets a profit of 20%. Find the cost price.

$$SP = CP + (\text{Profit} \times CP)$$

$$CP = \frac{SP}{1 + \text{Profit}} = \frac{800}{1 + 0.25} = 800 + (0.25 \times 800)$$

$$= \frac{720}{1 + \frac{20}{100}} = 800 + 200$$

$$CP = 600 = \underline{\underline{Ans}}$$

(U8) A shop keeper sells an item at a loss of 15%. If the cost price is ₹ 500. find the selling price

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

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

$$= \frac{500(100 - 15)}{100}$$

$$\begin{array}{r} 85 \\ \times 5 \\ \hline 425 \end{array}$$

$$= \frac{500 \times 85}{100}$$

$$= 425 \text{ Ans}$$

$$\text{Total FII} = E1 - 0.81 = 98$$

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

$$SP = CP(100 - \text{loss})$$

$$= \underline{\underline{1500(100 - 10)}}$$

$$1500$$

$$= 15 \times 90$$

$$= 1350 \text{ Ans}$$

90
15
450
90 X
1350

(50) A trader marks his goods at 30% above the cost price and ~~sold~~ allows a discount of 10%. What is his gain percent
(CP assume = 100)

$$MP = \underline{\underline{100(CP + 30\% \text{ of } CP)}}$$

$$= \frac{100 + 30}{100} \times 100$$

$$= 130$$

$$SP = MP - 10\% \text{ of } MP$$

$$= 130 - (0.10 \times 130)$$

$$SP = 130 - 13 = 117 \text{ Ans}$$