

Assignment - Percentage & Profit Loss

Q

① 25% of 200

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

② 10% of $x = 80$, find x ?

$$\Rightarrow \frac{10}{100} x = 80$$

$$x = \frac{80 \times 100}{10}$$

$$x = 200$$

③ 75% of $x = 150$, find x ?

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

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

$$x = \boxed{200}$$

④ 15% of 120 ?

$$\frac{15}{100} \times 120 \Rightarrow \boxed{18}$$

⑤ 30% of x is 90, find x

$$\frac{30}{100} x = 90 \Rightarrow \boxed{300}$$

⑥ The price of product increases from 200 to 250.
Find percentage increase.

$$\rightarrow \frac{\text{change} \times 100}{\text{initial value}} \Rightarrow \text{percentage change}$$



$$\rightarrow \frac{50 - 25}{200} \times 100 \Rightarrow [25\%]$$

Q8

10K to 50K \Rightarrow percentage change?

$$\Rightarrow \frac{10 - 5}{10} \times 100 \Rightarrow [25\%]$$

Q8

10K to 8K \Rightarrow % change?

$$\Rightarrow \frac{2}{10} \times 100 \Rightarrow [20\%]$$

Q9.

500 to 400 \Rightarrow % change?

$$\Rightarrow \frac{100}{500} \times 100 \Rightarrow [20\%]$$

Q10. If CP of an item is 600, SP = 450, % loss?

#	Gain / Profit \Rightarrow SP ↑	Loss \Rightarrow SP ↓	Profit & Loss
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G, SP \Rightarrow SP (+)

~~#~~ \Leftrightarrow

L, CP \Rightarrow SP (-)

G, SP \Rightarrow CP (-)

L, SP \Rightarrow CP (+)

~~#~~ Original \rightarrow New

CP \rightarrow SP

Sume (-)

$$G/L \% \Rightarrow \frac{SP - CP}{CP} \times 100$$

% change

$$\begin{array}{|c|c|} \hline CP + 10\% SP & CP - 10\% SP \\ \hline \end{array}$$

~~#~~ G = 10%

L = 10%

$$\bullet SP = \frac{110}{100} \times CP$$

$$\bullet SP = \frac{90}{100} \times CP$$

$$\bullet CP = \frac{100}{110} \times SP$$

$$\bullet CP = \frac{100}{90} \times SP$$

How much SP is \rightarrow will be - times of CP

Q10) CP = 600, SP = 450, %L ?

$$\begin{array}{r} 25 \\ \hline 6) 150 \\ 12 \\ \hline 30 \end{array} \Rightarrow \frac{600 - 450}{600} \times 100 \Rightarrow \frac{150}{6} \Rightarrow \boxed{25\%}$$

Q11) Which is greater: 30% of 40 or 40% of 30?

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

$$120 = 120$$

Q12) P spends 80% of his income + same ₹8K, total income?

$$\Rightarrow 40\% \text{ of } x = 8K$$

$$\frac{40}{100} \times x = \frac{200}{1000}K$$

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

Q13) A is 20% more than B, then R is how much less than A?

~~$$\begin{aligned} \Rightarrow A &= 20\% + B \quad \rightarrow \text{Assuming } B = 100 \\ &= \frac{20}{100} + B \\ &= \frac{20}{100} + 100 \\ &= \frac{220}{100} \Rightarrow 2.2 \rightarrow \frac{20 + 10000}{100} \\ &= 2000 \end{aligned}$$~~

$$A = 20\% + B$$

$$= \left(\frac{20}{100} \times 100 \right) + 100$$

$$\boxed{A = 120}$$

Assuming
B = 100

How much B is w.r.t A (i.e. w.r.t A)

$$\% \text{ change} = \frac{120 - 100}{100} \times 100 \Rightarrow \frac{20 \times 5}{60} = \frac{100}{3} = 33\frac{1}{3}\%$$

$$\begin{array}{r} 16.6 \\ \times 100 \\ \hline 166 \\ - 100 \\ \hline 66 \\ - 60 \\ \hline 6 \\ \times 10 \\ \hline 60 \\ - 60 \\ \hline 0 \end{array}$$

$$= \left(\frac{10}{120} \right) \times 100$$

$$= \frac{100}{6}$$

$$\boxed{16.67\%}$$

Q1h. Price of sugar ↑ 25%, how much should consumption reduced to maintain expense?

$$\% \text{ change} \Rightarrow 25\%$$

$$\rightarrow P_1 = 100, G = 100, E_1 = 10,000$$

$$P_2 = 125, C_2 = ?, E_2 = 10,000$$

$$C_2 = \frac{10,000}{125}$$

$$\boxed{C_2 = 80\%}$$

$$\therefore C_1 - C_2 = 20\%$$

~~Boat to Amrit
questions~~

Date _____

(15) A is income \rightarrow 40%. + B is income

Assume B = ₹ 100 Find A income %.

$$B = \frac{40}{100} \times 100 =$$

$$A = \frac{40 \times 100 + 100}{100} = 140$$

$$A + B = 140 - 100 = 40$$

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

$$= \frac{40}{100} \times 100 = 40 \quad | \quad 28.57\%$$

$$\begin{array}{r} 200 \\ 14 \\ \hline 20 \\ 14 \\ \hline 6 \\ 2 \\ \hline 4 \\ 2 \\ \hline 0 \\ 2 \\ \hline 19 \\ 19 \\ \hline 0 \\ 6 \\ 56 \\ 40 \\ 40 \\ \hline 12 \\ 12 \\ \hline 0 \\ 8 \\ 8 \\ \hline \end{array}$$

(16) If price of item $\uparrow 20\%$ then $\downarrow 10\%$
net % change = ?

$$\Rightarrow 100 \xrightarrow{+20\%} 120 \xrightarrow{-10\%} 108$$

$$\frac{10}{100} \times 120 = 12$$

$$\left. \begin{array}{l} 12 \\ \hline 8 \\ \text{Net change} = 8\% \end{array} \right|$$

(17) $x \uparrow 30\%, \downarrow 20\%$, \therefore Increase

$$\Rightarrow 100 \rightarrow 130 \rightarrow 104$$

$$\downarrow \quad \quad \quad 130 - 26$$

$$\frac{26}{100} \times 130 = 26$$

(18) $x \uparrow 25\%, \downarrow 20\%$, \therefore 0%

$$\Rightarrow 100 \rightarrow 125 \rightarrow 100$$

$$\downarrow \quad \quad \quad 125 - 25$$

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

(19) $x \uparrow 40\%, \downarrow 30\%$, \therefore -2%

$$\Rightarrow 100 \rightarrow 140 \rightarrow 98$$

$$\downarrow \quad \quad \quad 140 - 92$$

$$\frac{140 \times 30}{140} = 30$$

(20) $x \uparrow 20\%, \downarrow 10\%$, \therefore $8\% \uparrow$

$$\Rightarrow 100 \rightarrow 120 \rightarrow 108$$

$$\downarrow \quad \quad \quad 120 - 12$$

$$\frac{120 \times 10}{120} = 10$$

(21) If $\text{P} = 25\%$, then the S.P. is what % of CP

$$\Rightarrow \text{Assume } \rightarrow CP = 100 \therefore P = 25$$

$$SP = CP + P \therefore 125 \therefore \frac{125 \times 100}{100} =$$

(22) marked price $\Rightarrow x \Rightarrow 500$
 discount $\Rightarrow 10\%$. find CP = ?
 ↓ after discount
 8% profit

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

$$\text{i.e. } 500 - 50 \Rightarrow 450 = \text{SP}$$

$$\begin{array}{r} 45 \\ 18 \\ \hline 0 \end{array}$$

$$P_c = \frac{8}{100} \times 450 \Rightarrow 36$$

$$CP = SP - P \Rightarrow 450 - 36 \Rightarrow \underline{\underline{414}}$$

(23) Bought 20% off CP
 find Profit %. on SP ?

$$\begin{array}{r} 12 \\ 108 \\ \hline 18 \end{array} \Rightarrow \text{Assume } CP = 100 \quad P = 20 \quad SP = 120$$

$$\frac{20}{100} \times 120$$

$$\text{P.Y. w.r.t SP} = \frac{20}{100} \times \frac{50}{120} \Rightarrow \frac{50}{3} = 16.67\%$$

marked Price

$$SP = 12,000$$

$$SP = 960$$

$$\begin{array}{r} 12000 \\ 960 \\ \hline 1440 \end{array} \xrightarrow{\text{discount}} \begin{array}{r} 12000 \\ 960 \\ \hline 240 \end{array}$$

$$\begin{array}{r} 92 \\ 1100 \\ \hline 108 \end{array}$$

$$\% \text{ discount} = \frac{108}{1200} \times 100 \Rightarrow \underline{\underline{9\%}}$$

$$\begin{array}{r} 240 \\ 1200 \\ \hline 960 \end{array} \times 100 \Rightarrow \underline{\underline{20\%}}$$

$$\begin{array}{r} 85 \\ 1200 \\ \hline 80 \end{array}$$

(25)

$$C.P = 500, S.P = 650, P\% = ?$$

$$P\% = \frac{650 - 500}{500} \times 100 \Rightarrow 30\%$$

(26)

$$A's \text{ income} \Rightarrow 20\% + B$$

B income in percentage less than A?

$$B = 100, A = 120$$

$$B\% = \frac{100}{120} \times 100 = \frac{25}{3} \times 100 = 83\frac{1}{3}\%$$

$\boxed{16.67\%}$

12) $\frac{100}{90}$

6) $\frac{100}{40}$

(27)

$$\frac{B}{A} = \frac{3}{2}$$

\Rightarrow

$$\frac{3/2}{3} \times 100 = \frac{1}{2} \times 100 = 50$$

$$\text{Total } \leq 3 + 2 = 5$$

$$\frac{3}{5} \times 100 \Rightarrow \boxed{60\%}$$

\therefore % of pay w.r.t total students.

(28)

$$\text{Population} \Rightarrow 2,000,000$$

$$\Rightarrow 2,500,000$$

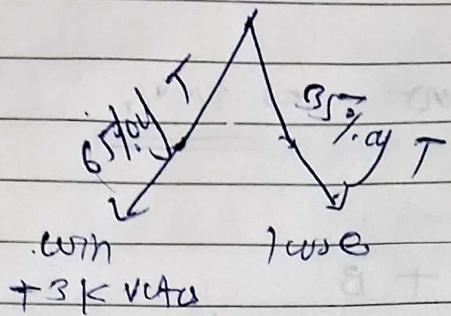
50k increased
every year

50
5
250

$$\Rightarrow \% \text{ change} = \frac{50,000}{2,000,000} \times 100 \Rightarrow 2.5\%$$

(29)

Total value



$$\frac{65}{100} \times 100$$

Whitney ratio $\Rightarrow T = 3000$

$$\left(\frac{65}{100} \times x \right) - \left(\frac{35}{100} \times x \right) = 3000 \quad \left| \frac{65}{100} \times x = T - 3000 \right.$$

 \downarrow

$$\therefore T = T - 3000 \times \frac{100}{65}$$

$$\left(\frac{65-35}{100} \right) \times x = 3000$$

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

$$\left| x = 10,000 \right.$$

10000

$$\frac{3000 \times 10}{50}$$

(30)

Price of article $\$ 3000$

$$\text{Price}_1 = 100$$

By what % the new price be increased to restore original

$$\text{Price}_2 = 70$$

price

$$\frac{x}{100} \times 20 = 30$$

~~$$x \times 70 = 100$$~~

~~$$x = 100$$~~

~~$$70$$~~

$$x = 70$$

~~$$x \times 100 = 70$$~~

$$x = \frac{300}{7}$$

~~$$100$$~~

~~$$x \times 70 = 30$$~~

~~$$100$$~~

~~$$x \times 100 = 70$$~~

$$x = 420857$$

~~$$30$$~~

~~$$28$$~~

~~$$20$$~~

~~$$28$$~~

$$x = \frac{3 \times 10}{7} = 4044$$

~~$$x = 30$$~~

(31) $x \times 150\% = 75$

$$x = \frac{75}{150} \times 100 = 50$$

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

$$A = 120 \quad B = 100$$

$$B = \frac{\frac{16}{100}}{100} \times 100 = \frac{16}{6} = 16.67\%$$

$$\begin{array}{r} 16 \\ \times 100 \\ \hline 1600 \\ - 1000 \\ \hline 600 \\ - 600 \\ \hline 0 \end{array}$$

(33) If 30% of $x = 90 \Rightarrow \frac{30}{100} \times x = 90$

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

$$x = \frac{3}{30} \times 100$$

↓

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

$$\boxed{x = 300}$$

(34) Person spend 75% of his income save ₹5000
Total income = ?

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

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

$$\boxed{T = 20000}$$

(Q) 35

Price of product $\uparrow 20\%$

$$P_1 = 100$$

$$C_1 = 100$$

$$E_1 = 10000$$

$$P_2 = 120$$

$$C_2 = R$$

$$E_2 = 10000$$

$$\begin{array}{r} 8 \\ \hline 12) 1000 \\ - 96 \\ \hline 40 \\ - 40 \\ \hline 0 \end{array}$$

$$120 \times C_2 = 10000$$

$$C_2 = \frac{10000}{120} \Rightarrow 83.33$$

$$\begin{array}{r} 100.00 \\ - 83.33 \\ \hline \end{array}$$

$$16.67$$

(Q) 36

$x \uparrow 20\% , \downarrow 10\%$

$$\begin{array}{ccc} 100 & \xrightarrow{\quad} & 120 \\ & \downarrow & \xrightarrow{\quad} \\ & 120 - 10 & = 108 \end{array}$$

$$\frac{120 \times 10}{100}$$

(Q) 37

MRP \Rightarrow CP + 25% of CP

discount $\Rightarrow 20\%$,

P/L % ?

\Rightarrow

Assume CP = 100

$$\left(\frac{25}{100} \times 100 \right) + 100 \Rightarrow [25 = MRP]$$

$$\frac{25}{100} \times 125 = 25 \text{ (discount)}$$

$$SP = 125 - 25 = 100$$

$$P/L \% = \frac{100}{100} \times 100$$

$$= 0$$

(Q8)

$$CP \Rightarrow 500 \\ 2\% \Rightarrow 20\% \\ SP = ?$$

$$\text{Loss} = \frac{20}{100} \times 500 \Rightarrow 100$$

$$SP = 500 - 100 \Rightarrow 400$$

(Q9)

$$x \text{ at } 10\% \\ 100 \rightarrow 110 \rightarrow 99 \\ 110 \times 10 \\ (x)$$

(Q10)

To pass $\rightarrow 40\% \text{ of } x \rightarrow x = \text{Total marks}$.

He gets 200 and fails by 20 m

so 220 is 40% of x

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

$$x = \frac{110}{220} \times 100$$

$$x = 550$$

$$\begin{array}{r} 4500 \\ 18000 \\ \hline 16 \\ 20 \\ 20 \\ \hline 00 \end{array}$$

(Q11)

20% on rent

30% on food

10% on family

+ 18000 savings

~~100%~~ ~~80 + 30 + 10 = 60%~~

~~40% savings~~

$$\therefore \frac{40}{100} \times T = 18000$$

$$\therefore T = \frac{18000 \times 100}{40}$$

(12) $\cancel{2} \times 930\% , \cancel{\downarrow 30\%}$
 $100 \rightarrow 130 \rightarrow 91$
 $130 \times \frac{30}{100}$

(13) current population = 10K, increases 10% per year.
 what will be after 3 yrs.

~~$\frac{11}{100}$~~
 ~~$\frac{11}{100}$~~
 ~~$\frac{11}{100}$~~
 $10,000 \left(\frac{110}{100} \right) \left(\frac{110}{100} \right) \left(\frac{110}{100} \right)$
 $\Rightarrow 13310$

(14) 15% of A = 20% of B

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

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

(15) CP = 800 \rightarrow SP = ?
 P% = 25

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

$$SP = 800 + 200 \Rightarrow 1000$$

(16) CP = 200 SP = 250
 P% = $\frac{25}{200} \times 100 \Rightarrow 25\%$

(47)

$$SP \Rightarrow 720 \quad CP = ?$$

$$P\% = 20$$

$$\left[SP = \frac{720 \times CP}{100} \right]$$

$$\frac{720 \times 100}{120} = CP \Rightarrow 600$$

(48)

$$SP \Rightarrow 500$$

$$L\% = 15\%$$

$$SP = \frac{85}{100} \times 500 \quad \boxed{SP = 425}$$

(49)

$$CP = 1500$$

$$SP = ?$$

$$L\% = 10\%$$

$$SP = \frac{90}{100} \times 1500 \rightarrow \boxed{1350 = SP}$$

(50)

$$P\% = 30\%, MRP = 30\% \text{ above } CP$$

\downarrow
10% discount

$$\text{Find } P\% = ?$$

Assume $CP = 100$

$$\left(\frac{30}{100} \times 100 \right) + 100 \rightarrow \boxed{130 = MRP}$$

$$\text{Discount} = \frac{10}{100} \times 130 \rightarrow \boxed{13 = \text{Discount}}$$

$$SP = 130 - 13 \rightarrow \boxed{117 = SP}$$

$$P\% = \frac{17}{100} \times 100$$

$$\boxed{P\% = 17}$$