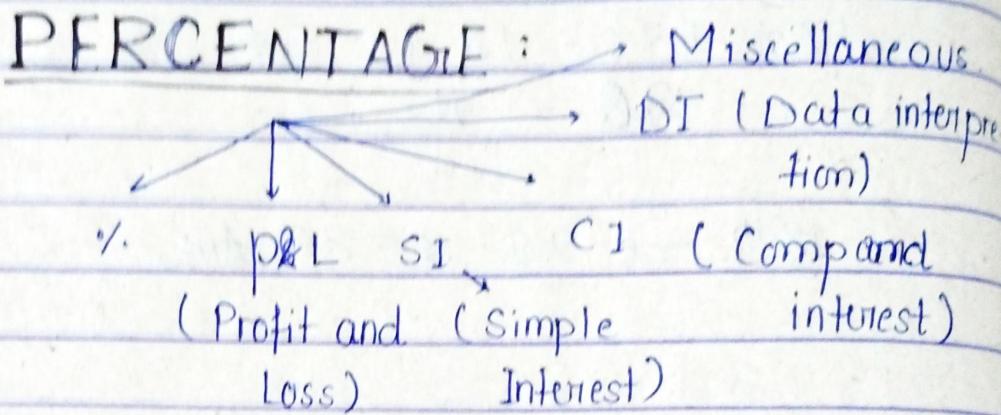


## Unit : 2



How to Convert percentage to Fraction :

- Every thing in this world is 100%.

$$100 \% = 1$$

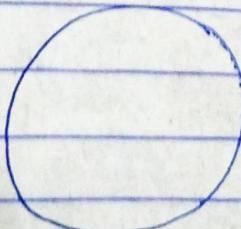
$$200 \% = 2$$

$$300 \% = 3$$

$$400 \% = 4$$

$$\vdots \quad \vdots$$

$$1000 \% = 10$$



$$\rightarrow 1 = 100\%$$

$$100\% = 1.$$

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

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

$$12\frac{1}{2}\% = \frac{1}{8}$$

$$6\frac{1}{4}\% = \frac{1}{16}$$

$$\begin{array}{r} 3 \sqrt{100(33)} \\ \quad \quad \quad 99 \\ \hline \quad \quad \quad 1 \end{array}$$

$$\Rightarrow 33\frac{1}{3}$$

(Value should not be less than  $\frac{1}{20}$ )

$$33\frac{1}{3}\% = \frac{1}{3}$$

$$16\frac{4}{6}\% \quad (\text{Half of } 33\frac{1}{3}\%)$$

$$= 16\frac{2}{3}\% = \frac{1}{6}$$

$$8\frac{1}{3}\% = \frac{1}{12}$$

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

$$\frac{1}{7}\% = 14\frac{2}{7}\%$$

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

$$\frac{1}{14}\% = \frac{1}{7}\%$$

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

$$\frac{1}{9} = 11\frac{1}{9}\%$$

$$\frac{1}{11} = 9\frac{1}{11}\%$$

% to fraction

$$10\% = \frac{10}{100} = \frac{1}{10}$$

$$15\% = \frac{15}{100} = \frac{3}{20}$$

$$\underline{Q.1} \quad 133\frac{1}{3}\% = \frac{400}{3} \times \frac{1}{100}$$
$$= \frac{4}{3}$$

Alternate method:

$$133 \frac{1}{3}\% = 100\% + 33 \frac{1}{3}\%$$

$$1 + \frac{1}{3} = \frac{4}{3} \text{ Ans,}$$

$$\underline{Q.2.} 162 \frac{1}{2}\% = \frac{163}{2} \times \frac{1}{100} = \frac{13}{8}$$

$$\begin{aligned} Q.3. \quad 266 \frac{2}{3}\% &= \frac{(266 \times 3 + 2)}{3} \times \frac{1}{100} \\ &= \frac{800}{3} \times \frac{1}{100} = \frac{8}{3}. \end{aligned}$$

$$6) \begin{array}{r} 3100 \\ -30 \\ \hline 100 \\ -6 \\ \hline 40 \end{array}$$

$$7) \begin{array}{r} 2000 \\ -14 \\ \hline 60 \\ -56 \\ \hline 40 \end{array}$$

285 5

## Fraction to percentage conversion

multiply 100 %.

$$\bullet \frac{1}{2} = \frac{1}{2} \times 100 \% = 50 \%$$

$$\bullet \frac{1}{3} = \frac{1}{3} \times 100 \% = 33 \frac{1}{3} \%$$

$$\bullet \frac{2}{7} = \frac{2}{7} \times 100 \% = 28 \frac{4}{7} \%$$

Alternate method:

$$\frac{1}{7} \times 2 = \frac{2}{7} = \frac{3-1}{7} =$$

$$\bullet \frac{20}{7} = \frac{20}{7} \times 100 = \frac{2000}{7} = 285 \frac{5}{7} \%$$

$$\bullet \frac{31}{6} = \frac{31}{6} \times 100 = 516 \frac{4}{6} \% = 516 \frac{2}{3} \%$$

$$\bullet 300\% - 14 \frac{2}{7}\%$$

$$= 285 \frac{5}{7}\%$$

$$\bullet \frac{29}{6} = \cancel{30} 483 \frac{1}{3}\%$$

All :  $\Rightarrow 5 - \frac{1}{6}$



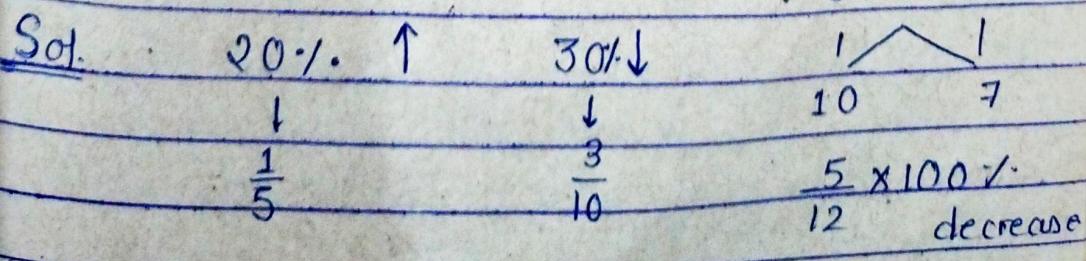
$$500\% - 16 \frac{2}{3}\%$$

$$= 483 \frac{1}{3}\%$$

Q My salary increased by 20% in first instant and decreased by 30% decreased second time.

Total %age change in my salary?

$\frac{5 \times 2}{6 \times 2}$



Q2) 40 is what percent of 60?

$$\rightarrow \frac{40}{60} \times 100 = 66 \frac{2}{3}\%$$

Q3) 60 is how much percent greater than 40?

$$\rightarrow \frac{I}{You} \times 100\% \quad [\text{Compare value is always in denominator}]$$

$$\frac{20}{40} \times 100 = 50\%$$

Q4) 40 is how much percent less than 60?

$$\rightarrow \frac{20}{60} \times 100\% = 33 \frac{1}{3}\%$$

Q5) A's salary is 20% more than B, then by how much B's salary is less than A.

$$\rightarrow A = 120$$

$$B = 100$$

$$\frac{20}{120} \times 100 = \frac{100}{6} = 16 \frac{2}{3}\% \\ = 16 \frac{2}{3}\%$$

Q.6) A's marks is 40% less than B.

By how much B's marks are more than A?

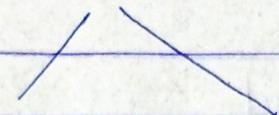
$$\rightarrow A = 60$$

$$B = 100$$

$$\frac{2}{60} \times 100 = \frac{200}{3} = 66.66\%$$

Q.7) If  $16 \frac{2}{3}\%$  of a number is added to itself, the number becomes 700. Find the original number?

$$\rightarrow 16 \frac{2}{3}\% = \underline{\underline{\frac{+1}{-}}}$$


  
Original       $7 = 100$   
 Lower                 $1 = 100$   

$$\begin{array}{r} 6 \\ \times 100 \\ \hline = 600 \text{ Ans} \end{array}$$

Q.8) A student multiplied a number by  $\frac{3}{5}$  instead of  $\frac{5}{3}$ . What is the error in percentage?

→ Let the no. be  $n$ .

$$\frac{\frac{5}{3}n - n}{\frac{3}{5}} \times 100\%$$

$$= \frac{\frac{5}{3}n - 9n}{\frac{15}{3}} \times 100$$

$$= \frac{16n}{155} \times \frac{3}{5} \times 100 \Rightarrow \frac{1600}{25}$$

= 64% of  $n$ .

## Alternate method

$$\frac{5}{3} \times 15 \Rightarrow 25$$

$$\frac{3}{5} \times 15 \Rightarrow 9$$

$$\frac{16}{25} \times 100\%$$

$$= 64\%$$

$$\text{LCM} = 3, 5$$

$$= \underline{15}$$

Q.9) The number was being multiplied by  $\frac{5}{6}$ . By mistake, it ~~is~~ is divided  $\frac{5}{6}$ . Find the percentage error?

Sol.. Let the no. be  $x$ .

$$\frac{x}{\frac{5}{6}} - \frac{x \times \frac{5}{6}}{x} \times 100$$

$$\frac{5}{6}$$

$$\frac{11x}{30} \times \frac{6}{5} \times 100$$

$$\frac{30}{5}$$

$$= 44\%$$

Alternate method

$$\frac{5}{6} \times 30 = 25 \Rightarrow \frac{11}{25} \times 100$$

$$\frac{6}{5} \times 30 = 36 = 44\%$$

Successive Increment and Decrement.

Formula :

$$\left( \frac{n+y+ny}{100} \right) \%$$

Q.1) The radius of the circle increased by 12.5%. What is area percentage changed?

$$\rightarrow \left( \frac{12.5 + 12.5 + (12.5 \times 12.5)}{100} \right) \%$$

$$\Rightarrow \left( \frac{25 + 1.5625}{100} \right) \% = 25 + 1.5625 \% = 26.5625 \%$$

$$\bullet \quad x = +20 \uparrow$$

$$y = -10 \downarrow$$

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

$$10 - 2 = 8\%$$

Q.2) If the length of rect. increase by 20% and width decrease by 30% ? Find the change in area.

$$\rightarrow \left( 20 - 30 + \frac{20 \times -30}{100} \right) \%$$

$$-10 \neq 6 \%$$

$$= -16\%$$

decrease by 16%

Q.3) Demand of a car went down by 25% in 2016 and 20% in 2017. What is net % decrease in demand?

Sol.

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

$$-45 + 5 = 40\% \downarrow \text{Ans.}$$

Q.4) If the length of a rectangle is increased by 20% and width is decreased by 30% then find the resultant change in area?

Sol.  $\left( 20 - 30 + \frac{20 \times (-30)}{100} \right)\%$   
 $= -16\%$

Q.5) A number is first increased by 15% and then decreased by 20%. The number so obtained is 64 less than the original number. What is the original no.?

$$\text{Sol. } 15 - 20 - \frac{20 \times 15}{100}$$

$$\Rightarrow 15 - 20 = 3$$

$$= 8\% \downarrow = 64$$

$$1\% = \frac{64}{8}$$

$$100\% = \frac{64}{8} \times 100\%$$

= 800 Ans.

Q.6) If the price of petrol is raised by 20% then the percentage by which a car owner must reduce his consumption so that there is no change in expenditure.

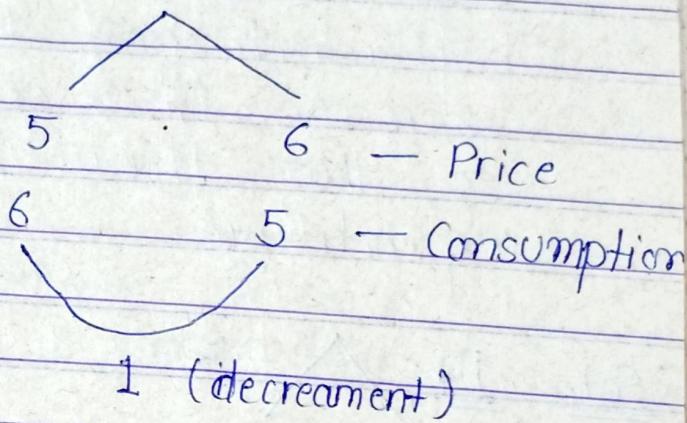
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<u>Fact</u>	Price $\propto \frac{1}{\text{Consumption}}$
-------------	--

E.g.:  $5:4 \rightarrow \text{Price}$   
 $4:5 \rightarrow \text{consumption}$ .

Sol<sup>n</sup>. 1st method

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



$$\frac{1}{6} \times 100\% = 16 \frac{2}{3}\%$$

2nd method

$$\frac{20}{100+20} \times 100\% = 16 \frac{2}{3}\%$$

$$\left[ \frac{a}{100+a} \times 100\% \right]$$

If incr,  $\left[ \frac{a}{100-a} \times 100\% \right]$

Q7) If the price of sugar is decreased by 12.5% then the percentage by which one household must increase his consumption so that there is no change in expenditure.

Sol.

Ist:

$$8 \rightarrow P$$

$$7 \rightarrow C$$

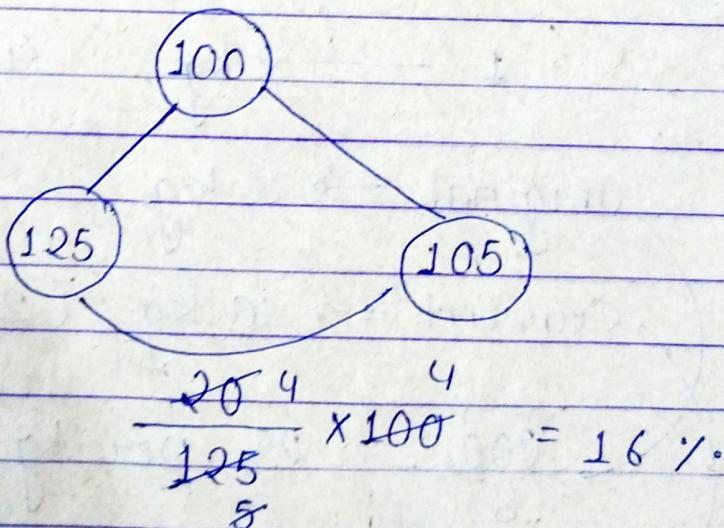
$$\frac{1}{7} \times 100\% = 14.28\%$$

Slide : 22

Q. 8) If the price of sugar is increased by 25% then by how much percent consumption should be reduced so that the expenditure will increase by only 5%.

$$\text{Expenditure} = \text{price} \times \text{commodity.}$$

Sol.

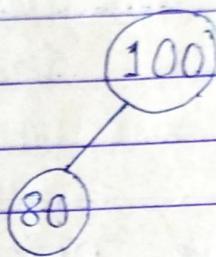


A Hintate

$$25 - y - \frac{25xy}{100} = 5\%$$

Slide : 23

Sol. Price of sugar reduced by 20%



$$\begin{array}{l} 20 \Rightarrow 1 - \text{current} \\ 80 \quad 4 - \text{original} \end{array}$$

2 kg more sugar

$$1 \longrightarrow 2 \text{ kg} \qquad 4 \longrightarrow 8 \text{ kg}$$

original  $\rightarrow$  8 kg

Current  $\Rightarrow$  10 kg (2 kg more)

$$\frac{200}{8} = 25 \text{ per kg.}$$

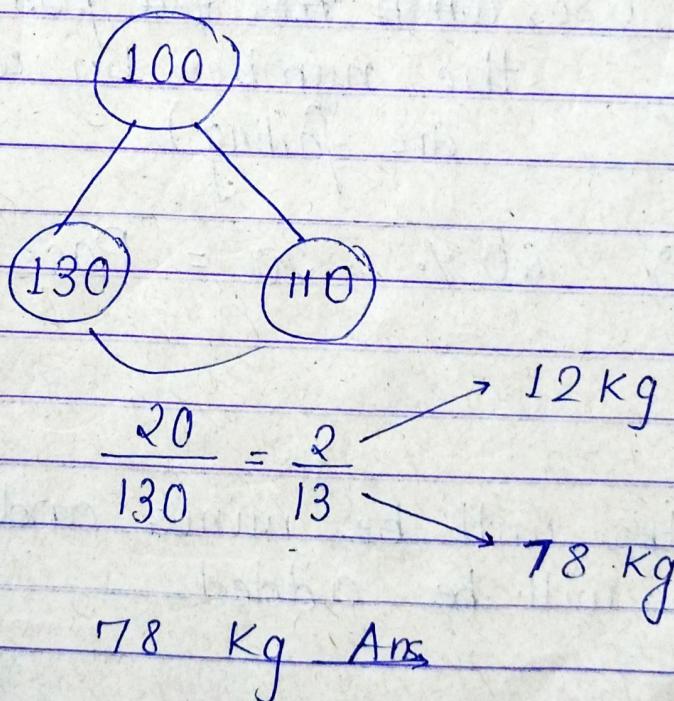
$$\frac{200}{10} = 20 \text{ per kg.}$$

Rs. 25 per kg Ans,

Alternate

$$\frac{20}{80} \times \frac{200}{2 \text{ kg}} = 25 \text{ kg}$$

Slide : 24



Slide : 25

## Question based on the Exam (Fail / Pass)

40% got and I failed by 10 more.

$$\textcircled{I} \quad 40\% + 10 = \text{Pass}$$

(So, when the ~~far~~ pass add the number by which we are failing)

$$\textcircled{II} \quad 60\% - 20 = \text{Pass}$$

Extra will be minus and less will be added.

Slide : 25

$$140 + 35 = \text{pass}$$

$$85\% = 175$$

$$100\% = \frac{175}{85} \times 100 = \frac{20}{7}$$

Slide : 26

$$25\% + 30 = 55 \text{ Pass} - (i)$$

$$50\% - 20 = 30 \text{ Pass} - (ii)$$

$$25\% = 50$$

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

(Total marks)

Put in I

$$25\% \text{ of } 100+30 = 80$$

$$\text{Passing \%} = \frac{80}{200} \times 100\% = 40\%$$

Slide : 27

$$30\% + 12 = \text{Pass}$$

$$40\% - 28 = \text{Pass}$$

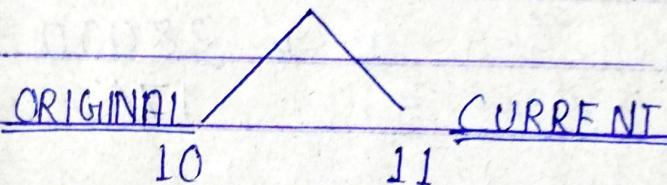
$$30\% = 40$$

$$100\% = \frac{40}{30} \times 100 \\ = 400$$

## Population based Questions

Slide : 30

$$10\% = \frac{1}{10}, \quad 12\% = \frac{+3}{25}$$

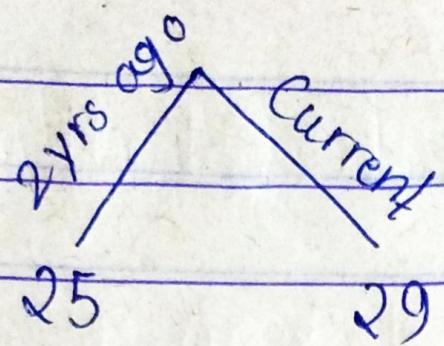


$$\begin{array}{ccc} \underline{25} & & \underline{28} \\ 250 & & 308 \\ & & \curvearrowleft x 200 \\ 5000 & \Leftarrow & 250 \\ 1 & \Rightarrow & 200 \end{array}$$

61600 Ans  $\rightarrow$

Slide : 31

$$16\% = \frac{4}{25}, \quad 20\% = \frac{1}{5}$$



5              6

$$125 \qquad 174 \Rightarrow 28000$$

$$\frac{1}{2} \Rightarrow 28000$$

$$\frac{1}{174} \Rightarrow 174$$

$$\frac{28000}{174} \times 125 = 20,000 \text{ (approx)}$$

Ans.

Slide : 32

## Investment Based Question

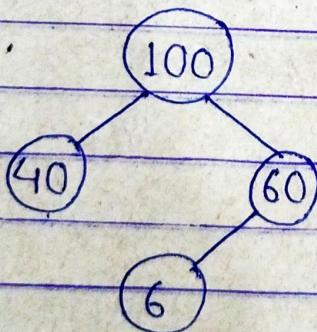
Slide : 32

Sol.

$$\begin{aligned} 65\% & \quad 15\% = 6000 \\ 20\% & \quad 1 \% = 6000 \\ 85\% & \quad 15 \\ 100\% & = \frac{6000 \times 100\%}{15} \\ & = 40000 \text{ Ans.} \end{aligned}$$

Slide : 33

Sol. 1st method



## 2nd method

$$40\% = 40 \times \frac{1}{100} = \frac{2}{5}$$

I Saving

5 3

10 9

6 5

300 135  $\rightarrow$  90

100  $\rightarrow$  90  $\times \frac{300}{135}$

Ans,

= 200 Ans,

Slide : 34

5 4  
2 1  
10 7  
100 28 = 6300

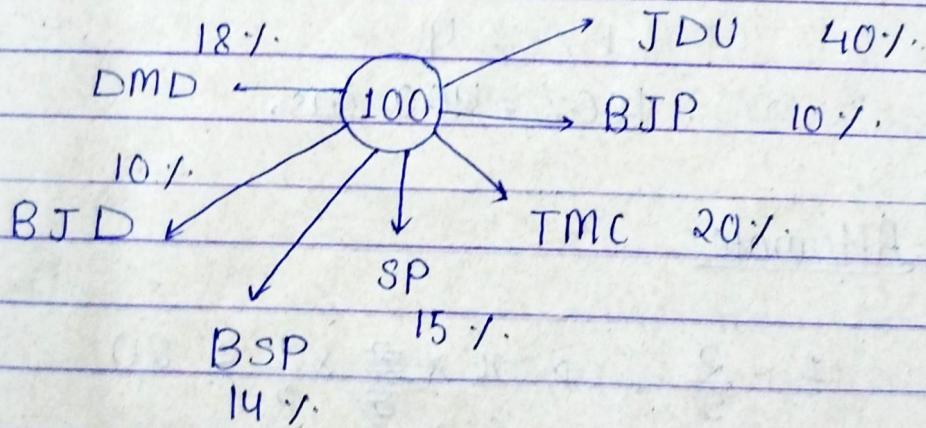
900 25

1 -  $\frac{6300 \times 100}{28 \times 4}$

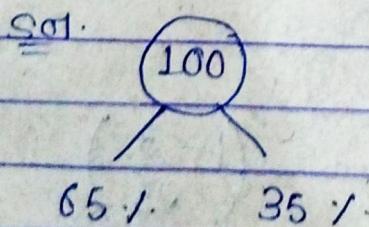
= 22500 Ans,

## Election-based Questions

- In Election-based question, always two parties are there, one winner and other loser. and the percentage difference of margin is equal to winning vote.



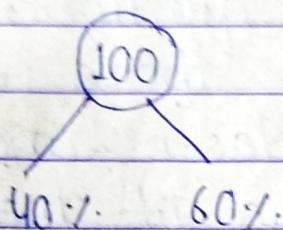
Slide: 35



$$30\% = 300$$

$$100\% = 1000$$

Slide : 36



$$20\% = 80$$

$$1\% = 4$$

$$100\% = 400 \text{ Ans.}$$

Alternate

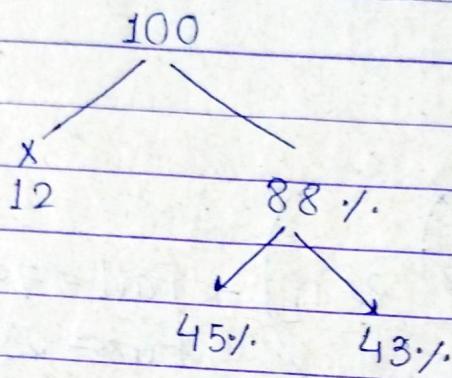
$$1 - \frac{2}{5} \Rightarrow n \cancel{\times \frac{2}{5}} \times \frac{1}{5} = 80$$

$$n = 400 \text{ Ans.}$$

Slide : 37

$$x \times \frac{22}{25} \times \frac{2}{100} = 2000 \quad \left(1 - \frac{3}{25}\right)$$

Slide : 37.

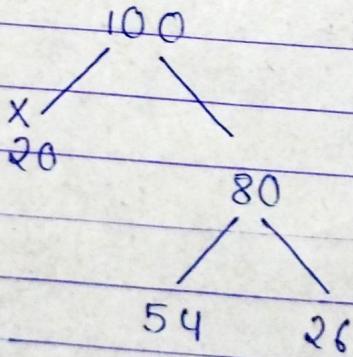


$$2\% = 2000$$

$$1\% = 1000$$

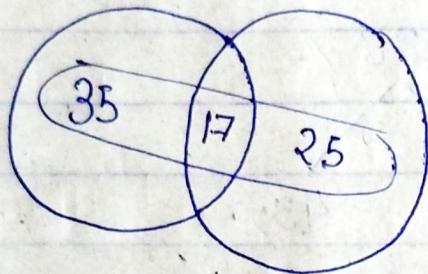
$$100 = 100000 \text{ Ans} \rightarrow$$

Slide : 38



## Miscellaneous Questions

Slide no: 28



$$\Rightarrow \text{Fail} = 77 \\ \text{Pass} = 23$$

Ans  $\rightarrow$  23

Slide : 29

# Profit and Loss

CP → Cost Price

SP → Selling Price

P → Profit

L → Loss

MP → Market price

d → discount

$$P = SP - CP$$

$$CP = 100 \quad SP = 120$$

$$P = 120 - 100 = 20$$

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

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

$$L = CP - SP$$

$$CP = 150, \quad SP = 120$$

$$L = 30$$

$$L\% = \frac{L}{CP} \times 100$$

$$L\% = \frac{30}{150} \times 100 = 20\%$$

$$Q. CP = 180 \quad P = 12.5\%$$

$$SP = ?$$

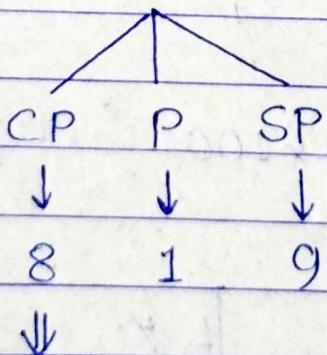
$$SP = \frac{CP \times (100 \pm P/L)}{100}$$

1st method :

$$\begin{aligned} &= \frac{180 \times (100 + 12.5)}{100} \\ &= 202.5 \quad \text{Ans.} \end{aligned}$$

2nd method :

$$P = 12.5\% = \frac{1}{8}$$



$$1 \text{ will be of } \frac{18}{8}$$

$$9 \text{ of } \frac{180 \times 9}{8} = 202.5 \text{ Ans.}$$

Q. CP = ?

$$L = 10\%$$

$$SP = 1850$$

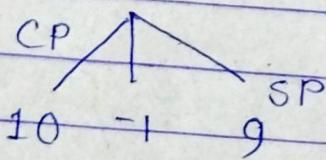
Sol.  $10\% = \frac{1}{10}$

Ist method :

$$CP = \frac{SP \times 100}{(100 \pm P/L)}$$

$$CP = \frac{1850 \times 100}{100 - }$$

2nd method :



$$9 = 1850$$

$$1 = \frac{1850}{9}$$

$$10 = \frac{1850 \times 10}{9}$$

$$= 2055.5$$

Q.  $CP = 2100$

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

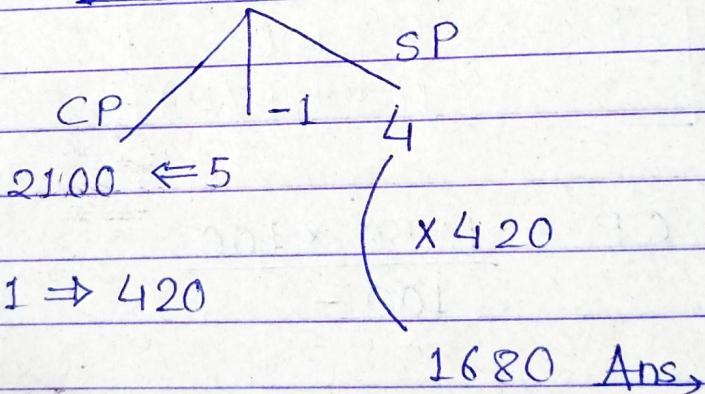
$$SP = ?$$

Sol.

Ist method

By formula

2nd method



# Discount

$$D = MP - SP$$

$$D\% = \frac{D}{MP} \times 100 \%$$

Laptop = 50000  $\Rightarrow$  MP / Market / Invoice  
/ Listed.

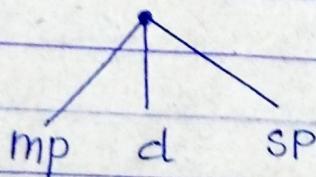
Q.1 :  $MP = ?$

$\downarrow$   
 $d$

$$D = 15 \% = 3/20 \rightarrow MP$$

$$SP = 2891700$$

Sol. Ist method



20      -3      17

$$17 = 2891700$$

$$1 \rightarrow 2891700 = 17100 \\ 17.$$

$$20 \rightarrow 17100 \times 20 = 342000$$

Ans.

## 2nd method

$$SP = \frac{mp \times (100 - d\%)}{100}$$

Put the values in the above formula.

## Slide 11

Formula:

$$SP_2 = \frac{SP_1 \times P_2}{P_1}$$

$$\frac{18700 \times 115}{85} = \frac{25300}{22500} \text{ Ans.}$$

$P_1$  (First P/L)

$P_2$  (Last P/L)

Alternate:

$$SP_1 = 18700$$

$$CP = 22000$$

$$L = 15\%$$

$$P = 15\%$$

$$(in) CP_2 = ?$$

$$SP_2 = 25300 \text{ Ans.}$$

$$CP = 22000$$

## Slide : 12

$$CP = 4700$$

$$SP = 5800$$

$$\begin{array}{ccc}
 & CP & P & SP \\
 & 4700 & 300 & 5800 \\
 & + 800 & & \\
 & \hline
 & 5500 & &
 \end{array}$$

$$\begin{array}{rcl}
 20 \\
 \underline{300} \times 100 \% & = & \underline{60 \%} \\
 \hline
 5500 & & 11
 \end{array}$$

## Slide : 13

CP of 25 articles = SP of 20 articles

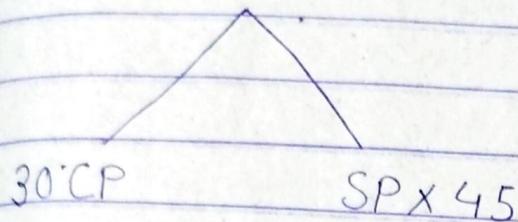
$$\begin{array}{c}
 \text{25 CP} \quad \text{---} \quad \text{SP} \times 20 \quad (\text{margin system})
 \end{array}$$

$$CP = 20$$

$$SP = 20$$

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

## Slide 14



$$CP = 45$$

$$SP = 30$$

$$\text{Loss} = \frac{15}{45} \times 100$$

= 33.33% Loss

## Slide 15

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

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

$$SP = 12$$

$$CP = 12$$

(Same article selling)

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

$$4 SP = 12 CP - 12 SP$$

$$16 SP = 12 CP$$

$$SP = 12$$

$$CP = 16$$

25 %

$$\frac{4}{16} \times 100 = 33\frac{1}{3}\% \text{ loss. Ans.}$$

### Slide 16

$$P = 66 \text{ SP} - 66 \text{ CP}$$

$$6 \text{ SP} = 66 \text{ SP} - 66 \text{ CP}$$

$$60 \text{ SP} = 66 \text{ CP}$$

$$\frac{6}{60} \times 100 = 10\% \text{ Profit}$$

Ans.

### Slide 18 (New Pattern)

(In this type quest., make the no. of

Article	Rs	articles together
$10 \times 11$	$10$	$\times 10 = \text{CP} = 100$
$11 \times 10$	$11$	$\times 11 = \text{SP} = 121$

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

$$= 121 - 100$$

$$= 21$$

$$\text{Profit \%} = \frac{21}{100} \times 100 \text{ (Ans) } 21\% \text{ sbil 2}$$

Slide : 19

<u>Article</u>	<u>Rs</u>
10 x 12	15 x 14
12 x 10	14 x 15

18 : sbil 2

## Slide: 21

$\frac{100}{(100 \text{ paise})} : \frac{110}{= 100 \text{ Rs.}}$  — Price Ratio

$$P \propto \frac{1}{\text{Consumption/Product}}$$

$110 : 100 = 11 : 10$  — Product

So, we purchased 11 and sold 10.  
10 Ans.

Slide : 22

100 : 125 — Price ratio

125 : 100 — Product ratio

$$= 5 : 4$$

$$\begin{matrix} \downarrow \\ 25 \end{matrix}$$

$$(1 \rightarrow 5)$$

25 : 30 Ans.

$$\begin{pmatrix} \times 5 \\ \end{pmatrix}$$

$$20 \text{ Ans.}$$

Slide : 24 (If 24 rupees excluded  
from question : 30 Ans.)

80 : 120 — Price ratio  
(20% loss) (20% gain)

120 : 80 — Product ratio

$$45 = 3 : 2$$

$$1 \rightarrow 15$$

$$\begin{pmatrix} \times 15 \\ = 30 \end{pmatrix}$$

$$\begin{array}{ccc}
 40 \text{ Rs} & \longrightarrow & 30 \\
 1 & \longrightarrow & \frac{30}{40} \\
 & & 6 \\
 24 & \longleftarrow & \frac{30}{40} \times 24 \quad \text{Ans.} \\
 & & 40
 \end{array}$$

Slide : 25

$\frac{3}{5}$  — original.

$$3 \times 15\% = 45\%$$

$$\begin{array}{l}
 \text{Job loss } 3 \times 15\% = 45\% \rightarrow \text{Ans.} \\
 (\text{with } 0.85 \times 420\% = 100\%) \quad \downarrow
 \end{array}$$

$$2 \times 27.5\% = 55\%$$

So ~~Ans.~~ 27.5% Ans.

Slide : 26

$$\frac{5}{7}$$

88 : abit

$$\cancel{7} \times 14\% = 98\%$$

$$5 \times 14\% = 70\%$$

$$2 \times ? \% = ?$$

$$7 \times 18\% = 116\%$$

Slide : 27

$$1 \times -10 = -10\%$$

$$\cancel{2} \times ? = ? \rightarrow 70$$

$$3 \times 20 = -60$$

$$? = 35\%$$

Question based on cheater / error

Slide : 28

$$1 \text{ kg} = 1000 \text{ g}$$

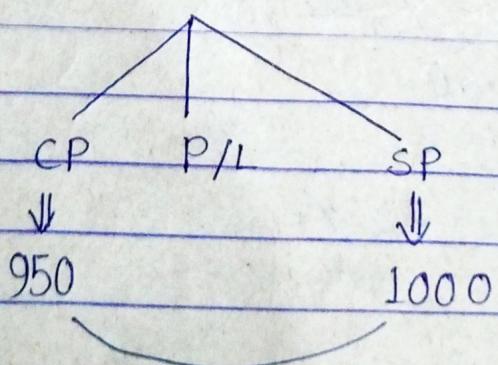
950 gm

$$\frac{1000 - 950}{950} \times 100$$

$$\Rightarrow \frac{50}{950} \times 100 = \frac{100}{19} \\ = 5.26 \%$$

Profit : 12

Alternate :



$$\frac{50}{950} \times 100 = 5.26 \%$$

Slide : 29

: ~~case~~ ability

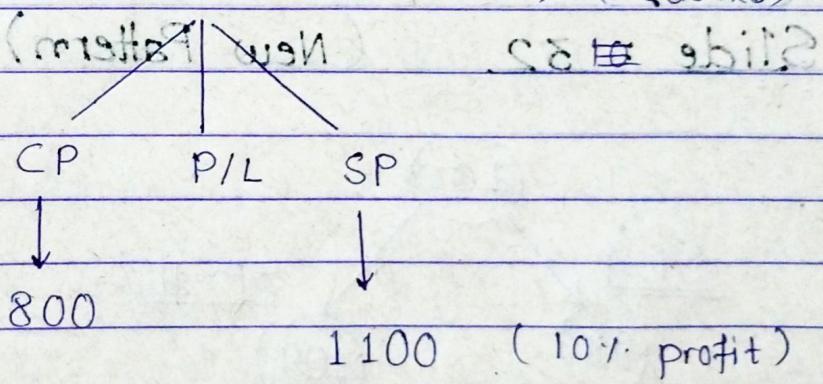
$$\Rightarrow \frac{1000 - 800}{800} \times 100$$

$$= \frac{200}{800} \times 100 = 25 \% \text{ Ans,}$$

Slide : 30

$$1000 \text{ g} = 1 \text{ kg}$$

↳ (100% profit)



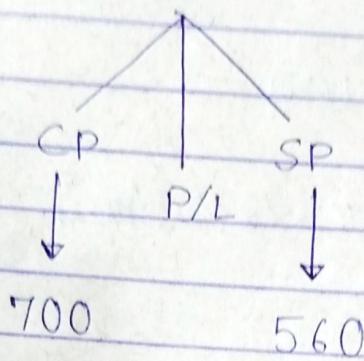
$$\Rightarrow \frac{300}{800} \times 100 = \frac{300}{8}$$

$$= 37.5 \% \text{ Ans}$$

Profit

## Slide 31 :

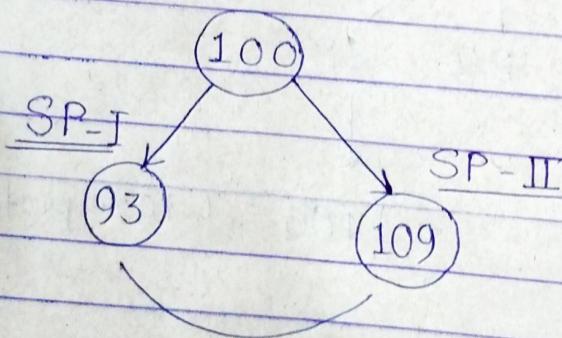
P.L : 50%



$$\frac{20}{140} \times 100 = 20\% \text{ loss. Ans.}$$

(\*\*\*\*)

## Slide : 32 (New Pattern)



$$109 - 93 = 16$$

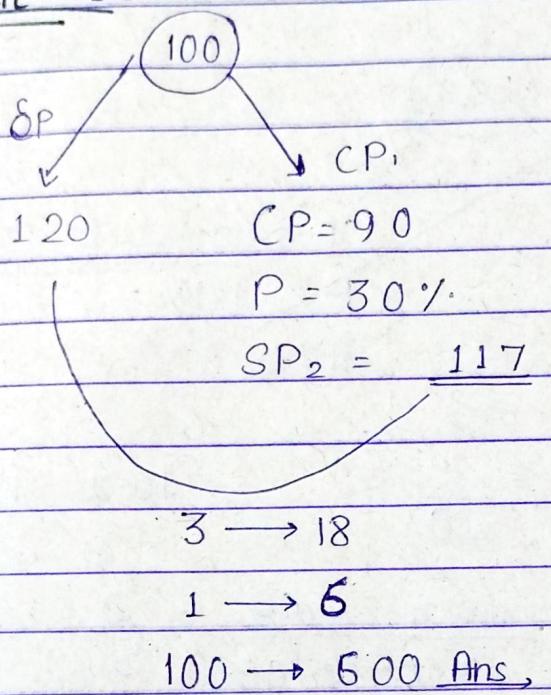
$$16 = 800$$

$$1 \Rightarrow 50$$

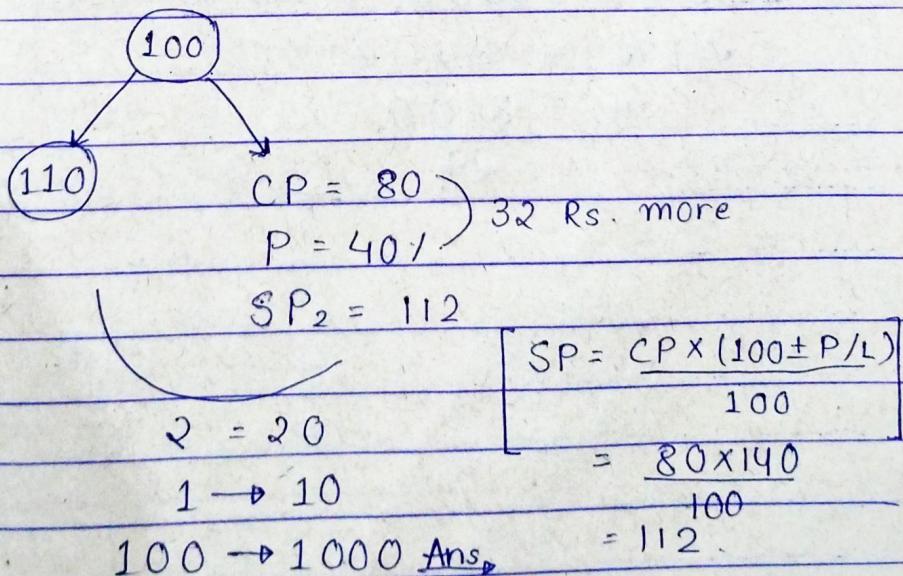
$$100 \Rightarrow 5000 \text{ Ans.}$$

Slide : 33

(Q.H) 28: 5.6.12

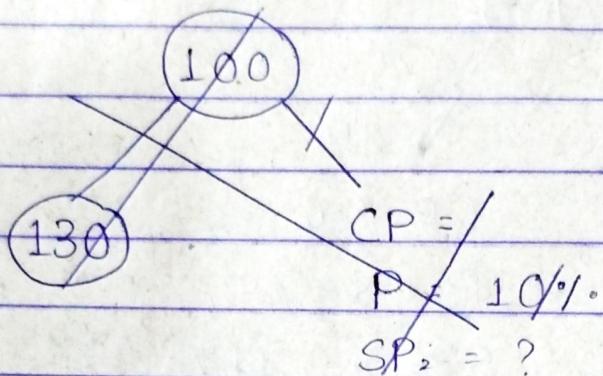


Slide : 34



Slide : 35 (H.W)

ex : abil?



$$30\% = \frac{3}{10} \quad 10n \quad 13n$$

$$\frac{10n - 2700}{13n - 2700} = \frac{2}{5}$$

$$50n - 5 \times 2700 = 26n \quad \cancel{+ 5400}$$

$$50n - 13500 = 26n - 5400$$

$$24n = 8100$$

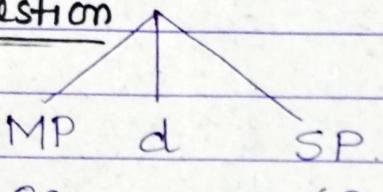
$$n = \frac{8100}{24}$$

## Problems on Discount

Slide:

Buy 4, get 1 free

Slide: Question



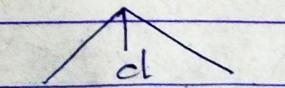
80                    68  
↓  
12

$$\frac{12}{80} \times 100 = 15\%$$

$d = \frac{SP - MP}{MP} \times 100\%$

Ans: 15%

$d\% = \frac{d}{mp} \times 100\%$



50                    40  
↓  
2

$$\frac{10}{50} \times 100 = 20\%$$

Buy 4, Get 3 free offers

Buy 4, Get 3 free offers

$$\begin{array}{ccc} & \swarrow & \searrow \\ \text{MP} & & \text{SP} \\ \downarrow & & \downarrow \\ 70 & & 40 \\ \end{array}$$

Offer : 3 bits

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

Slide: 41

Successive discount.

$$\boxed{SP = \frac{MP \times (100 - d_1\%)}{100} \times \frac{(100 - d_2\%)}{100}}$$

$$448 = MP \times \frac{70}{100} \times \frac{50}{100} 2$$

$$MP = \frac{448 \times 2 \times 10}{7}$$

$$= 64 \times 20 = 1280 \text{ Ans.}$$

Slide: 42

$$CP \times (100 \pm P/L) = MP \times (100 - d)$$

$$CP \times 110 = MP \times 88$$

$$\frac{CP}{MP} = \frac{88}{\cancel{100}} 110$$

$$\frac{22}{88} \times 100 = 25 \% \text{ Ans}$$

9  
22%  
A/F

## SI and CI

SI : Simple

In case of SI ; always calculated on principle (original principle)

→ P : Principle

→ R : Rate

→ T : Time

→ SI : Simple Interest

→ A : Amount

$$SI = \frac{P \times R \times T}{100}$$

$$R = \frac{SI \times 100}{P \times T}$$

$$T = \frac{SI \times 100}{P \times R}$$

$$P = \frac{SI \times 100}{R \times T}$$

$$A = SI + P$$

$$\text{Q.1} \quad P = 1000$$

$$R = 10\%$$

$$T = 2 \text{ yrs}$$

$$SI = \frac{P \times R \times T}{100}$$

$$= \frac{1000 \times 10 \times 2}{100} = 240$$

$$\text{Q.2} \quad P = 2000$$

$$R = 10\%$$

$$T = 2 \text{ yrs } 6 \text{ months } 15 \text{ days}$$

$$SI = ?$$

$$A = ?$$

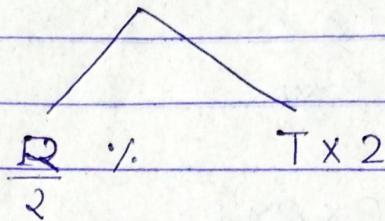
$$SI = \frac{P \times R \times T}{100}$$

$$= \frac{2000 \times 10 \times \left(2 + \frac{1}{2} + \frac{15}{365}\right)}{100}$$

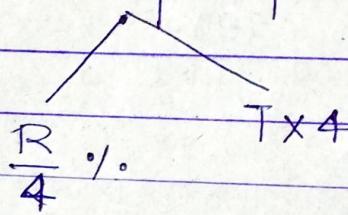
$$= 200 \times \left( \frac{2.54109}{365} \right)$$

$$= 508.21 \quad \underline{\text{Ans}}$$

\* In case of half yearly



\* In case of quarterly.



$$\therefore \underline{\text{Q.}} : P = 2500$$

$$R = ?$$

$$T = 1.5 \text{ yr}$$

$$A = 3000$$

$$A = SI + P$$

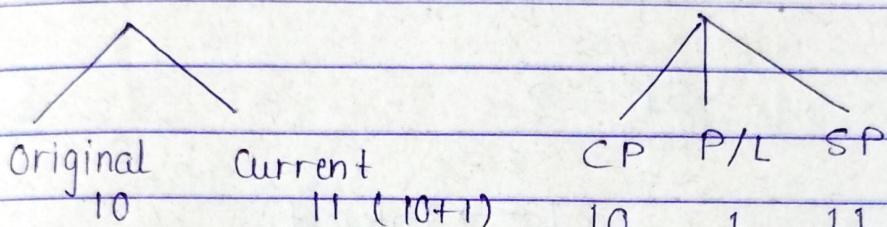
$$3000 = SI + 2500$$

$$SI = 500$$

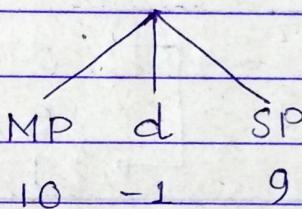
$$500 = 2500 \times R \times \frac{3}{2}$$

$$100$$

$$R = \frac{500}{25} \times 2 = \frac{40}{3} = 13.33\%$$



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



Q.  $P = 100$

R: simple

$$R = 10\% = 1/10$$

$$T = 2 \text{ yrs.} \quad \hookrightarrow \text{original}$$

$$SI = ?$$

$$10 = 100$$

$$1 \rightarrow 10$$

$$2 \rightarrow 20 \text{ Ans.}$$

R: simple

$$Q. P = 2000$$

$$R = 20\% = 1/5$$

$$T = 3 \text{ yrs.}$$

$$SI = ?$$

$$\frac{1}{5} \rightarrow \text{Interest}$$

$$5 \rightarrow P$$

$$\begin{array}{rcl} \rightarrow 3 \times 400 & = & 1200 \\ 5 \Rightarrow 2000 \\ \rightarrow 1 \Rightarrow 400 \end{array}$$

Slide : 5

$$432 = 1200 \times \frac{1}{100} \times R$$

$$\frac{432 \times 100}{1200} = 6 \text{ Ans.}$$

Slide : 6

$$P = ?$$

$$SI = 5400$$

$$R = 12\%$$

$$T = 3 \text{ yr.}$$

$$P = \frac{SI \times 100}{R \times T}$$

$$= \frac{5400 \times 100}{12 \times 3} = 15000 \text{ Ans.}$$

Slide : 7

Ques:

$$SI = 450 \times 4.5 \times T$$

$$T = \frac{8100}{450 \times 4.5} = \frac{900}{50} = 18 \text{ yrs}$$

Slide : 8

SI is always same

$$6^{\text{th}} \text{ also } 3000$$

$$7^{\text{th}} \text{ " } 3000$$

$$8^{\text{th}} \text{ " } 3000$$

$$9000 \text{ Ans.}$$

Slide : 9

$$R = n \quad R = (n+3)\%$$

$$\text{diff} = 300$$

$$\frac{P(n+3)(2)}{100} - \frac{Px n \times 2}{100} = 300$$

$$\Rightarrow 2nP + 6P - 2nP = 30000$$

$$6P = 30000$$

$$P = 5000 \text{ Ans.}$$

Slide: 10

e : shilz

$$TH 2 - 1008 = 104$$

$$104 = P \times R \times$$

$$2 \text{yr} \Rightarrow A_1 = 1008 ) \quad 104$$

$$3 \text{yr} \Rightarrow A_2 = 1112$$

2 : shilz

$$* A = P + SI$$

$$SI = A - P$$

o

$$104 \times 2 = 208 = SI$$

$$P = ?$$

$$A = 1008$$

$$T = 2 \text{yr}$$

e : shilz

$$R = ?$$

$$R = \frac{104 \times 100}{800 \times 1} = 13\%$$

Slide: 11

I.D.

$$S_1 + S_2 = S \text{ [Total SI]}$$

$$\frac{400 \times 5 \times R}{100} + \frac{600 \times 4 \times R}{100} = 132$$

$$\Rightarrow 2000R + 2400R = 13200$$

$$20R + 24R = 132$$

$$44R = 132$$

$$\frac{R}{44} = \frac{132}{44}$$

$$= 3\%$$

\*\*\* (v. imp)

Slide: 12

$$x = P_1 , R_1 = 12\% , T = 1$$

$$(20000 - x) = P_2 , R_2 = 14\% , T = 1$$

$$S_1 + S_2 = S$$

$$\frac{x \times 12 \times 1}{100} + \frac{(20000 - x) \times 14 \times 1}{100} = 2560$$

$$\Rightarrow 12x + 280000 - 14x = 256000$$

$$\therefore 280000 - 2x = 256000$$

$$x = 12000$$

## SI continued

Slide 12

12%.

14 %.

(12.8) Avg value

$$\left[ \begin{array}{l} R = 2560 \times 100 \\ 20000 \times 1 \\ = 12.5 \end{array} \right]$$

1.2 : 0.8

12 : 8

3 : 2 → 8000

3 + 2 = 5 → 20000

12000                    1 → 4000

₹ 12000, ₹ 8000 Ans,

Slide: 13

5%

6%

17

(5.67)

$$\left[ \begin{array}{l} R = 85 \times 1500 \times 100 \\ 1500 \times 1 \\ = 5.6 \end{array} \right]$$

0.33% : 0.67

1

: 2

↓  
500

↓  
900

$$2+3 \rightarrow 1500$$

$$5 \rightarrow 1500$$

$$1 \rightarrow 300$$

: formula

$$600, 900$$

: formula

$$\text{So, } 600 \text{ Ans} \rightarrow 500.$$

## Slide : 17

$T = 8$  yrs. (doubles)

Step : I

$$P = 1$$

$$A = 2$$

$$T = 8$$

$$R = ?$$



$$SI = 1.$$

$$R = \frac{SI \times 100}{P \times T}$$

$$= \frac{1 \times 100}{1 \times 8}$$

$$= 12.5\%$$

Step : II

$$P = 1$$



$$SI = 3$$

$$A = 4$$

$$T = \frac{SI \times 100}{P \times R}$$

$$R = 12.5\%, T = ?$$

$$T = \frac{3 \times 100}{1 \times 12.5} = 24 \text{ yrs.}$$

Alternate:

By formula:

$$\text{Last} = \frac{(m-1)}{(n-1)} \times T$$

First

$$= \frac{(4-1)}{(2-1)} \times 8$$

$$= 3 \times 8 = 24 \text{ yrs.}$$

## CI

SI : sbil8

In case of CI ;

Interest calculated on previous interest , called CI .

## SI

## CI

$$P = 100$$

$$1 \rightarrow 10 \text{ ₹}$$

$$10 \text{ ₹}$$

$$R = 10\%$$

$$2 \rightarrow 10 \text{ ₹}$$

$$11 \text{ ₹}$$

$$(10\% \text{ of } 10 = 1)$$

$$3 \rightarrow 10 \text{ ₹}$$

$$12.1 \text{ ₹}$$

$$(10\% \text{ of } 11 = 1.1)$$

(mini.)

SI : sbil8

Q.  $P = 2000$

$$R = 10\% \rightarrow 1/10$$

$$T = 3 \text{ yr}$$

$$CI = ?$$

$$A = ?$$

$$A = P \left( 1 + \frac{R}{100} \right)^n$$

$$\begin{array}{ccc}
 & \Delta & \\
 P & & A \\
 10 & & 11 \\
 10 & & 11 \\
 \hline
 10 & & 11 \\
 \hline
 2000 = 1000 & & 1331
 \end{array}$$

( 3 yrs so  
3 times )

\*  $A = \frac{CI + P}{CI - P} = 662 \text{ Ans.}$

Q.  $P = 4000 \text{ ₹}$   
 $R = 12.5\% \rightarrow 1/5$   
 $T = 1.5 \text{ yr} \rightarrow 10 \text{ yr} = \frac{1}{10}$   
 $CI = ?$

$$\begin{array}{ccc}
 & \Delta & \\
 5 & & 6 \\
 \hline
 10 & & 11 \\
 \hline
 4000 = 50 & & 66
 \end{array}$$

$SI : 1280 \text{ Ans.}$

$1 \rightarrow 80 \rightarrow CI = 16 \times 80 = 1280 \text{ Ans.}$

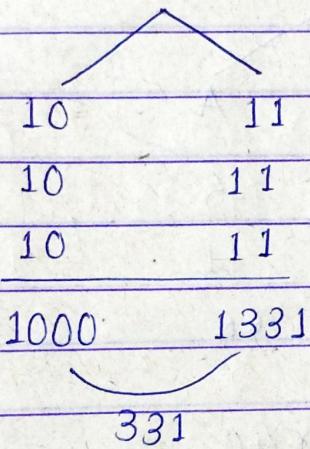
## CI continued...

Slide: 19

$$P = 1000 \quad R = 10\% \text{ pa} \quad T = 3 \text{ yrs}$$

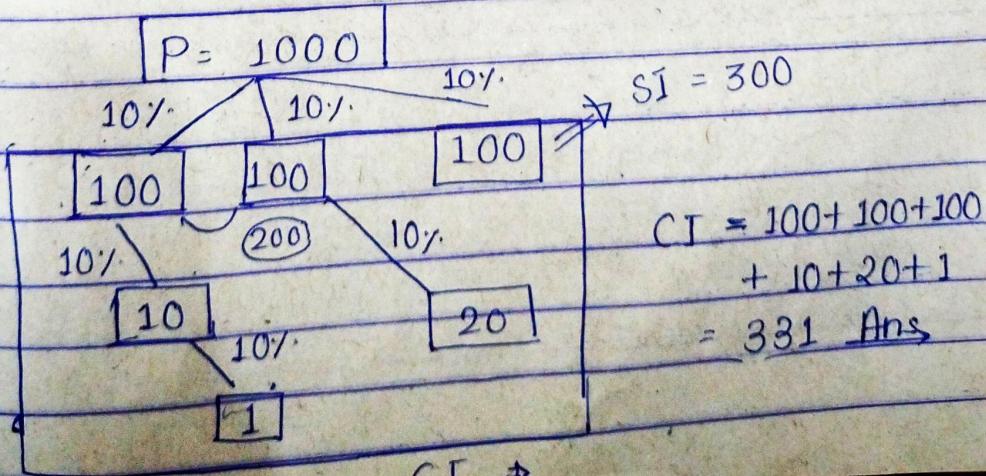
↓

$$1/10$$



$$CI = 331 \xrightarrow{\text{Ans}}$$

Alternate :



$$* A = P + CI$$

$$CI = A - P$$

...basitms [ ]

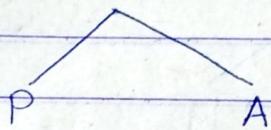
Q.  $P = 2000$

$$R = 20\% \rightarrow 1/5 \quad \xrightarrow{20\% \times \frac{1}{2} \text{ (as } 0.5\text{)}} 10\%$$

$$T = 1.5 \text{ yr.} \Rightarrow 1 \left\{ \begin{array}{l} 5 \\ 5 \end{array} \right\} = 10\%$$

$$CI = ?$$

$$A = ?$$



$$\frac{10}{5} \quad \frac{11}{6}$$

$$2000 \leftarrow \frac{50}{5}$$

$$40 \leftarrow 1$$

$$CI = 16 \times 40$$

$$= 640 \text{ Ans}$$

$$A = 2000 + 640 : \text{Ansatz}$$

$$= 2640 \text{ Ans}$$

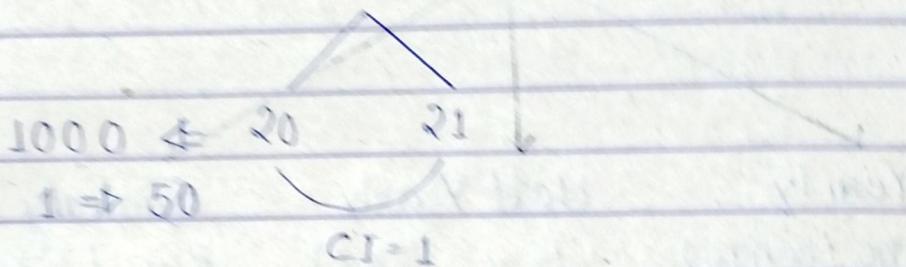
$$\left[ \begin{array}{l} 1 \text{ yr} = 12 \text{ months} \\ 1 \text{ month} = \frac{1}{12} \text{ yr} \end{array} \right]$$

Q.  $P = 1000$

$$R = 10\% \rightarrow \frac{1}{10} \rightarrow \frac{1}{2} \rightarrow \frac{1}{20}$$

$$T = 6 \text{ months}$$

$$CI = ?$$



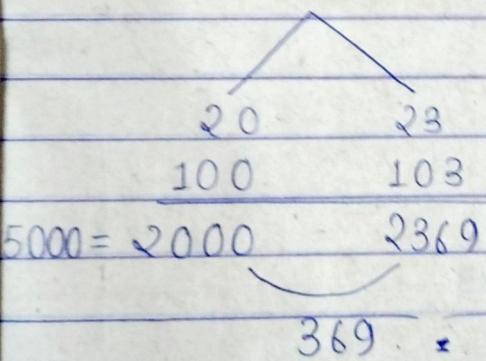
$$CI = 1 \times 50 = 50$$

Q.  $P = 5000$

$$R = 15\% \rightarrow \frac{3}{20} \times \frac{1}{5} = \frac{3}{100}$$

$$T = 1 \text{ yr. } 73 \text{ days} = \frac{1}{5} \text{ yr.}$$

$$CI = ?$$

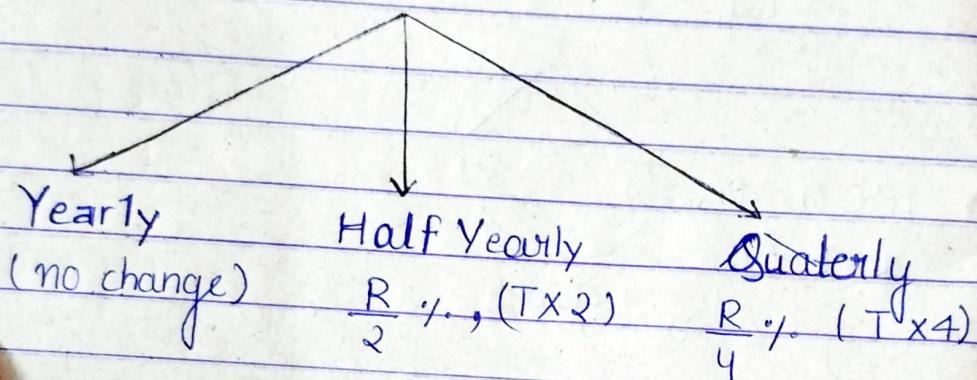


$$\left[ \begin{array}{l} 1 \text{ yr} = 365 \text{ days} \\ 1 \text{ day} = \frac{1}{365} \end{array} \right]$$

$$\left. \begin{array}{l} \text{Initial amount} = 1 \\ \text{Rate} = \frac{1}{10} \\ \text{Time} = 1 \end{array} \right\}$$

$$C.I. = 369 \times 2.5$$

$$= 922.5 \quad \underline{\text{Ans.}}$$

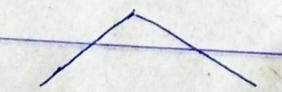


Slide : 25

$$P = 10000$$

$$r = 10\% = \frac{1}{10} \times \frac{3}{5} = \frac{3}{50}$$

$$T = 2 \frac{3}{5} \text{ yrs.} \Rightarrow 2 + \frac{3}{5}$$



10                  11

$$10000 \times 10\% = 1000$$

$$1000 = 100 \times 50$$

$$10,000 \leftarrow 5000$$

11

53

6413

1413

$$CI = 1413 \times 2 \quad : \text{at } 20\% \text{ p.a.}$$

$$= 2826 \text{ Rs.} \quad \underline{\text{Ans.}}$$

Slide : 26

$$P = 8000, 20\% = r, 9 \text{ months.}$$

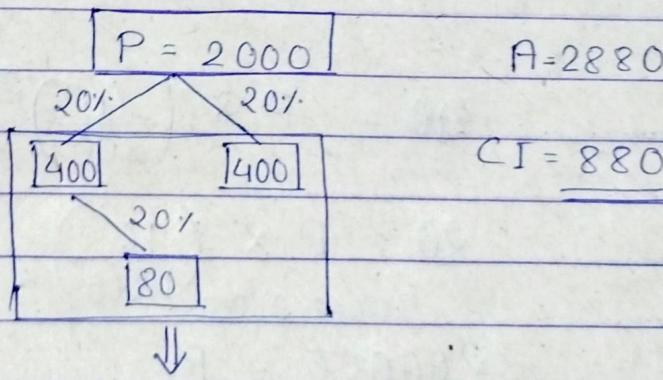
$$\begin{array}{ccc} & \downarrow & \downarrow \\ \frac{1}{5} \times \frac{1}{4} & = \frac{1}{20} & 9 \times 4 \\ = 36 \text{ months.} & & \\ = 3 \text{ yrs.} & & \end{array}$$

↓

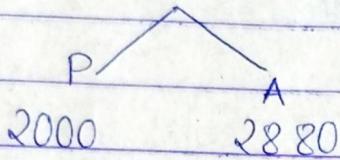
20	21
20	21
20	21
8000	

Ex : abil.

Slide : 27



Alternate:



Ans: 8%  
Rs. 80/-

$$100 : 144 \\ 10^2 : 12^2$$

$$\frac{2}{10} = \frac{1}{5} \times 100\% = 20\%. \text{ Ans.}$$

Slide: 31

Difference between SI and CI for  
2 yrs, diff: 4%. 20. Rs. 80/-

$$20 = P \times \left(\frac{4}{100}\right)^2$$

$$20 = P \times \left(\frac{16}{10000}\right)$$

$$\underline{200000} = P$$

$$4 16$$

$$P = 12500 \text{ Ans.}$$

Q : Find

Difference b/w SI and CI

$$\left[ \text{Formula} \Rightarrow P \times \left( \frac{R}{100} \right)^n \right] (\text{Difference})$$