एक आदमी अपनी आय का 75% खर्च करता है। यदि उसकी आय में 20% की और खर्च में 10% की वृद्धि हो जाए तो उसकी बचत में कितने प्रतिशत की वृद्धि होगी?

Solution :- I (BASIC)

INCOME − Exp = Saving

100 − 75 = 25

(+20% ↑ (10% ↑ x%)

120 − 82.5 = 37.5

$x\% = \frac{12.5}{25} \times 100 = 50\%$

II (Alligation)

खर्च : बचत

75% : 25% = 3 : 1

E 10% S x%

I (20%)

3 : 1

$\Rightarrow \frac{x-20}{20-10} = \frac{3}{1}$

$\Rightarrow x = 50\%$

एक व्यक्ति अपनी आय का 20% किराए पर, शेष का 30% खाने पर और उसके शेष का 50% शिक्षा पर खर्च करता है। अन्त में उसकी बचत 6300/- है। तो उसकी आय क्या थी?

Solution :-

$6300 \times \frac{100}{80} \times \frac{100}{70} \times \frac{100}{50} = 22500$ Ans.

कोई विक्रेता कुल बिक्री पर 12% कमीशन देता है। तथा 15000 रु से ऊपर की बिक्री पर 1% बोनस देता है। यदि विक्रेता की कुल आय 7650/- रु है तो कुल कितने रु की बिक्री हुई?

Solution :- I (BASIC)

माना कुल बिक्री = x रु०

$\therefore x * \frac{12}{100} + (x - 15000)\frac{1}{100} = 7650$

$\Rightarrow \frac{12x}{100} + \frac{x}{100} - 150 = 7650$

$\Rightarrow x = 60,000$ Ans.

II (TRICKY)

15000 | +

12% | 13%

1%

15000 × 1% = 150

7650 + 150 = 7800

⇒ 13% x600 7800

100% x600 60,000

A student multiplied a NUMBER by $\frac{3}{5}$ instead of $\frac{5}{3}$. what is the PERCentage error in the calculation?

Solution : Let the NUMBER = 15 (LCM of 3 & 5)

wrong Result = $15 \times \frac{3}{5} = 9$, Actual Result = 25

% ERROR = $\frac{25-9}{25} \times 100 = 64\%$ ANS.

Two Number are less than a third Number by 30% and 37% respectively. The Percent by which second Number is less by first is?

Solution :- Let third NO = 100

$\Rightarrow$ I NO = 70, II NO = 63

Req. Result $\frac{7}{70} \times 100 = 10\%$ ANS.

IF the Numerator of a fraction is ↑ by 20% and denominator is ↓ by 10% the resultant fraction becomes $\frac{36}{45}$. Find the original fraction?

Solution :- Let original fraction = $\frac{x}{y}$

$\therefore \quad \frac{x\,[1.20]}{y\,[.90]} = \frac{36}{45} \Rightarrow \frac{x}{y} = \frac{36}{45} \times \frac{9}{12} = \frac{3}{5}$ ANS.

If the Income Tax is increased by 19%, then Net income will be decreased by 6%. Find the Rate of income tax?

Solution:- [CONCEPT] Net Income = Income − Tax

$\Rightarrow$ Net Income + Tax = INCOME

in these type of questions Income is same

Note:- If Tax is ↑ by ₹x, Net Income will be decreased by ₹x. OR vice-versa but % may vary.

e.g. $\begin{matrix} NI & T & I \\ 50 & + 30 & = 80 \\ 45 & + 35 & = 80 \end{matrix}$] same

TRICKY:- Income is same

19% of Tax = 6% of Net Income

$\Rightarrow \frac{19}{6} = \frac{\text{Net Income}}{\text{Tax}} \Rightarrow$ Income = 19+6 = 25

$\text{Tax \%} = \frac{\text{Tax}}{\text{income}} \times 100 = \frac{6}{25} \times 100 = 24\%$ ANS.

If income Tax is increased by 19%, Net income get decreased by 1%. Find the Tax Rate?

Solution:- 19% of Tax = 1% of Net INCOME

$\Rightarrow \frac{\text{Tax}}{\text{Net Income}} = \frac{1}{19} \Rightarrow$ Income = 1+19 = 20

$\text{Tax \%} = \frac{1}{20} \times 100 = 5\%$ ANS.

A candidate got 25% marks and fail by 30 marks while another candidate who scores 50% marks gets 20 marks more than minimum required marks to pass the Examination. Find the maximum and passing MARKS for the Exam?

Solution :- equate passing MARKS

I II

$25\% + 30 = 50\% - 20$

$\Rightarrow 25\% = 50 \quad \therefore mm\ (100\%) = 2 \times 100 = 200$

$1\% = 2$ passing MARKS $= 25\% + 30$

= 80 ANS

किसी परीक्षा में 60% छात्र अंग्रेजी में उत्तीर्ण होते हैं। 70% हिन्दी में और 40% दोनों विषयों में उत्तीर्ण (पास) होते हैं। तो दोनों में फेल होने वाले छात्रों का प्रतिशत क्या होगा?

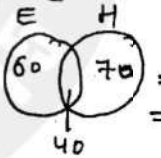
Solution :- I (FORMULA)

$N(A \cup B) = N(A) + N(B) - N(A \cap B)$

$= 70 + 60 - 40 = 90$

failed in both $= 100 - 90 = 10\%$

II (VENN Diagram)



$= 60 + 70 - 40$

$= 90\%$ pass

fail $= 100 - 90 = 10\%$

किसी परीक्षा में 80% छात्र अंग्रेजी में और 85% गणित में उत्तीर्ण होते हैं। जबकि 75% दोनों में उत्तीर्ण होते हैं। यदि 45 छात्र इन दोनों विषयों में अनुत्तीर्ण हुए हो तो कुल छात्रों की संख्या ज्ञात करो?

Solution :-

E → 80 %
H → 85 %] +165 %
−75
90 % — pass

fail $= 100 - 90 = 10\%$

$10\% \longrightarrow 45$

$100\% \longrightarrow 450$ ANS.

रामबाण (जिसको माना वो नहीं आएगा)
जो बचेगा वो आएगा

A total of ₹ 180 is to be divided among 100 students such that each girl student receives ₹2 and each boy student receives ₹1.5. Find the Number of girl students?

Solution :- I
let all are boys
money divided will be
= 100 * 1.5
= 150
money Rem ⇒ 180 − 150 = 30
which was due to diff of .50
girls = $\frac{30}{0.5}$ = 60 ANS.
(Boys माने तो girl आएगी)

OR II
माना सारी लड़कियां भी 100 की 100
money = 100 × 2 = 200
मितना ज्यादा = 200 − 180
= 20
क्योंकि लड़को को .5 कम मिल रहे थे।
लड़के = $\frac{20}{.5}$ = 40
(girls माने तो boys आएगी)
⇒ girls = 100 − 40 = 60

In a 200, there are only pigeons and rabbits if there are total of 200 heads and 560 legs then find the Number of pigeons and Rabbits?

Solution :- Let all are pigeons (200)
∴ legs = 200 × 2 = 400
extra = 560 − 400 = 160
but extra 160 is due to 2 more legs of Rabbit
Rabbit = $\frac{160}{2}$ = 80 Ans
(Pigeon माना तो Rabbit आएगा)
Pigeon = 200 − 80 = 120 Ans.

OR Let all are Rabbits (200)
∴ legs = 200 × 4 = 800
gap = 800 − 560 = 240
240 ज्यादा coz pigeon has two less legs
pigeon = $\frac{240}{2}$ = 120
(Rabbit माना तो pigeon आएगा)
Rabbit = 200 − 120 = 80

Each correct answer fetches 4 marks and each wrong answer fetches a penalty of 1 mark. If a student attempts 48 questions and scores 132 marks. then find the Number of correct and wrong answers?

Solution:- let he attempted all (48) correct

Total marks $= 48 * 4 = 192$

but his actual score is 132. Difference of 60 is due to diff. of 5 (4 − (−1)) b/w correct and wrong

$\#\text{wrong} = \frac{60}{5} = 12$ [correct माना तो wrong आएगा]

$\#\text{correct} = 48 - 12 = 36$ Ans

Population of a Town is 15000. If the Number of the males ↑ by 8%. and that of females by 10%. then the population would increase to 16300 after 1 yr. Find the Number of females?

Solution:-

I

let all are male

∴ Population after 1yr

$= 15000 + \frac{15000 \times 8}{100}$

$= 16200$

gap $= 16300 - 16200$

$= 100$ less

$\#\text{females} = \frac{100}{10\% - 8\%} \times 100 = 5000$

(male माना तो female आया)

II

let all are females

Population after 1yr

$= 15000 + \frac{15000 \times 10}{100}$

$= 16500$

gap $= 16500 - 16300$

$= 200$ Extra

$\#\text{males} = \frac{200}{2\%} \times 100$

$= 10,000$

(female माना तो male आया)

$\#\text{female} = 15000 - 10000 = 5000$

A man lent ₹000 partly at 5% and balance at 4%. If he receives ₹ 92 as annual interest. find the amount lent at 5%?

Solution :- Let whole amnt is invested at 4%.

SI after 1yr $= \frac{2000 \times 4}{100} = 80$ ₹

gap $= 92 - 80 = 12$ ₹ [Coz Rate diff $= 5\% - 4\% = 1\%$]

amnt lent at 5% $= \frac{12}{1} \times 100 = 1200$ Ans.

[4% मानो तो 5% वाला आएगा]

A man covers a total of 240 km in 6 hours partly at 30 km/hr and rest at 60 km/Hr. what distance was covered at 30 km/Hr.

Solution:- Note → Ratio of speed gives Ratio of Time

let he covered all distance at 60 km/Hr

∴ in 6 hours $D = 60 \times 6 = 360$ km

gap $= 360 - 240 = 120$ km

Time for 30 km/hr journey $= \frac{120}{60-30} = 4$ Hr

[60 को मानो तो 30 का time आया]

$D = 4 \times 30 = 120$ km Ans.

PROFIT & LOSS

Profit, Loss & Discount
(लाभ, हानि और बट्टा)

Terminology :-

Cost Price (C.P.) क्रय मूल्य
The price at which article is bought or money that goes out of pocket.

Selling Price (S.P.) विक्रय मूल्य
The price at which article is sold or the amount of money that comes into pocket.

Note :- The Selling Price (S.P.) of the seller is the cost price of the buyer.

PROFIT (लाभ) if SP > CP

$P = SP - CP$ = वि० मू० − क्र० मू०

LOSS (हानि) if CP > SP

$L = CP - SP$ = क्र० मू० − वि० मूल्य

IF PROFIT on selling an article for ₹ 425 is same as loss on selling it for ₹ 355. Find the cost price of the Article?

Solution :- I (BASIC)

let C.P. = X

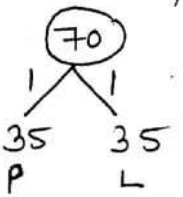
P = L

$425 - X = X - 355$

$\Rightarrow 2X = 780 \Rightarrow X = 390$ A.

II (TRICKY)

Find $SP_2 - SP_1 = 425 - 355 = 70$



OR III $\frac{SP_1 + SP_2}{2} = \frac{425 + 355}{2} = 390$ ANS.

$\therefore$ CP = 425 - 35 = 390

OR CP = 355 + 35 = 390

किसी वस्तु को 1560 में बेचने पर जो लाभ होता है, वह उसी वस्तु को 760 में बेचने पर हुई हानि से 3 गुणा है। तो उस वस्तु का क्र० मू० क्या होगा?

Solution :- I (BASIC)

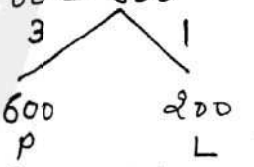
let C.P. = X

P = 3 L

$\therefore 1560 - X = 3(X - 760)$

$\Rightarrow 4X = 3840 \Rightarrow X = 960$ ANS.

II $1560 - 760 = 800$



CP = 1560 - 600 = 960 > ANS.

OR CP = 760 + 200 = 960

IF the Profit on selling an article for ₹ 480 is 25% more than loss on the selling it for ₹ 300. Find the cost price of article?

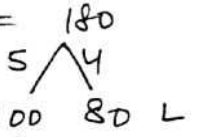
Solution :-

P : L

125 : 100

5 ; 4

$SP_2 - SP_1 = 480 - 300 = 180$



$\Rightarrow$ CP = 480 - 100 = 380

OR CP = 300 + 80 = 380 ANS.

Profit and Loss is always calculated/Reckoned on cost price unless otherwise stated.
लाभ और हानि प्रतिशत हमेशा क्रय मूल्य (C.P.) पर ज्ञात किए जाते हैं। परन्तु, अगर Examiner बोले दे कि आपको वि०मू० पर निकालना है तो आप वि०मू० पर ही निकालें।

$\text{PROFIT \%} = \frac{\text{PROFIT}}{\text{COST PRICE}} \times 100 = \frac{P}{CP} \times 100$

$\text{LOSS \%} = \frac{\text{LOSS}}{\text{COST PRICE}} \times 100 = \frac{L}{CP} \times 100$

e.g. CP = 800 SP = 1000

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

CP = 800, SP = 400

$\therefore L\% = \frac{400}{800} \times 100$

$= 50\%$ loss

#

PROFIT (P%)	LOSS (L%)
$SP = CP * \frac{(100+P\%)}{100}$	$SP = CP * \frac{(100-L\%)}{100}$
OR $CP = \frac{SP * 100}{(100+P\%)}$	OR $CP = \frac{SP * 100}{(100-L\%)}$

METHOD 1 (100% वाला तरीका)

आपको क्रमशः (CP) को हमेशा 100% लेना है।

e.g let P% = 20% → CP = 100%
→ SP = 120%

L% = 20% → CP = 100%
→ SP = 80%

CP = 600, P% = 20%, SP = ?

100% → 600

1% → $\frac{600}{100}$

SP = 120% → $\frac{600}{100} \times 120 = 720$ Ans.

SP = 5120 L% = 20%, CP = ?

L% = 20% → CP = 100%
→ SP = 80% → 5120

1% → $\frac{5120}{80}$

CP = 100% → $\frac{5120}{80} \times 100$

6400 Ans.

CP = ? P% = 25% SP = 6250

P% = 25% → CP = 100%
→ SP = 125% → 6250

CP 100% → $\frac{6250}{125} \times 100 = 5000$

METHOD 2 (Ratio वाला तरीका)

इसमें सबसे पहले आपको P% या L% को fraction में convert करना है।

e.g. $P\% = 20\% = \frac{1 \to P}{5 \to CP} \Rightarrow SP \to 5+1=6$

$L\% = 20\% = \frac{1 \to L}{5 \to CP} \Rightarrow SP = 5-1 = 4$

$P\% = 12.5\% = \frac{1 \to P}{8 \to CP} \Rightarrow SP = 8+1 = 9$

$L\% = 16\frac{2}{3}\% = \frac{1 \to L}{6 \to CP} \Rightarrow SP = 6-1 = 5$

$P\% = 14\frac{2}{7}\%$, $CP = 490$, $SP = ?$

$14\frac{2}{7}\% = \frac{1 \to P}{7 \to CP} \Rightarrow SP = 8$

$7 \longrightarrow 490$

$1 \longrightarrow 70$

$8\ (SP) \longrightarrow 70 \times 8 = 560$ Ans.

$L\% = 10\%$ $SP = 7290$, $CP = ?$

$10\% = \frac{1 \to L}{10 \to CP}$

$\Rightarrow SP \to 10-1 = 9$

$9 \longrightarrow 7290$

$10 \to \frac{7290 \times 10}{9} = 8100$ Ans.

$P\% = 40\%$, $CP = 3000$, $SP = ?$

$40\% = \frac{2 \to P}{5 \to CP} \Rightarrow SP = 5+2 = 7$

$5 \longrightarrow 3000$

$7 \longrightarrow \frac{3000}{5} \times 7 = 4200$ Ans.

$L\% = 8.33\%$

$SP = 1210$, $CP = ?$

$8.33\% = \frac{1 \to L}{12 \to CP}$

$SP \to 12-1 = 11$

$11 \longrightarrow 1210$

$12 \to \frac{1210}{11} \times 12 = 1320$ Ans.

IF Ratio of cost price and selling price is 8:9. Find Profit/Loss %?

Solution:- $\frac{CP}{SP} = \frac{8}{9} \Rightarrow$ Profit = 1 $\Rightarrow P\% = \frac{1}{8} \times 100$

$= 12.5\%$

IF SP is $\frac{5}{4}$ of CP. Find Profit %?

Solution:- SP : CP

$\frac{5}{4} : 1 \Rightarrow P\% = \frac{1}{4} \times 100$

OR $5 : 4$ $= 25\%$ ANS.

IF Profit is calculated on SP then P% = 20%. what is original P% (on CP)?

Solution:- $20\% = \frac{1 \rightarrow P}{5 \rightarrow SP} \Rightarrow CP = 4$

Actual P% on CP $= \frac{1}{4} \times 100 = 25\%$ ANS.

IF Loss% is calculated on SP, then L% = 10%. what is original Loss% ? (on CP)

Solution:- $L\% = 10\% = \frac{1 \rightarrow L}{10 \rightarrow SP} \Rightarrow CP = 10 + 1 = 11$

Actual $L\% = \frac{1}{11} \times 100 = 9.09\%$ ANS

P% on CP = 12.5% then P% on SP?

$12.5\% = \frac{1 \rightarrow P}{8 \rightarrow CP} \Rightarrow SP \rightarrow 9$

P% ON SP $= \frac{1}{9} \times 100 = 11.11\%$ ANS.

By selling a mobile for ₹ 1045 a man loss 5%. At what price should he sell the mobile to gain 5% ?

Solution :- I (Basic)

CP = 100% always

SP_1 = 95% [5% LOSS]

SP_2 = 105% [5% gain]

95% ⟶ 1045

⇒ 105% ⟶ $\frac{1045}{95} \times 105 = 1155$

II (Tricky)

5% LOSS = $\frac{1 \to L}{20 \to CP}$

$SP_1 = 19$

5% gain = $\frac{1 - P}{20 - CP}$

SP_1	$SP_2 - 21$
19	× 55
× 55	
1045	1155

एक आदमी को एक पेंट को 1920 में बेचने पर 20% की हानि हुई। यदि वह उसे 2520 ₹ में बेचता तो कितने % की लाभ या हानि होती ?

Solution :- I (BASIC)

1920 ⟶ 80% [20% L]

1 ⟶ $\frac{80\%}{1920}$

2520 ⟶ $\frac{80\%}{1920} \times 2520$

= 105%

105% means 5% Profit

II (TRICKY)

$\frac{SP_1}{100 \pm P/L} = \frac{SP_2}{100 \pm P/L}$

$\frac{192}{80} = \frac{252}{100 \pm P/L}$

⇒ $100 \pm P/L = 105$

⇒ $\pm P/L = 5$

⇒ P% = 5%

An Article is sold at 8% loss. Had the shopkeeper sold it for ₹ 650 more he would have gain 5%. Find the cost price?

Solution :- I (BASIC)

Let CP = ₹ X

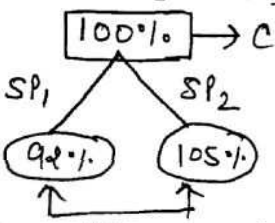
SP_1 SP_2

$X[.92] + 650 = X[1.05]$

$\Rightarrow X[.13] = 650$

$\Rightarrow X = 5000$ Ans.

II (TRICKY)



$\therefore$ 100% → 5000 Ans

एक दुकानदार ने एक मोबाईल 5% हानि पर बेचा। अगर वो पहले से इसको ₹ 3375 ज्यादा में बेचता तो उसको अब 10% का लाभ होता। वह उस मोबाईल को कितने ₹ में बेचे कि अब उसको 20% का लाभ हो?

Solution :- I (BASIC)

माना CP = ₹ X

SP_1 SP_2

$X[.95] + 3375 = X[1.10]$

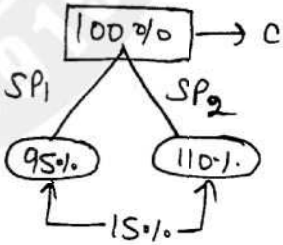
$\Rightarrow X[.15] = 3375$

$\Rightarrow X = 22500 \rightarrow CP$

$SP_3 = 22500[1.20]$

$= 27000$ ₹ Ans.

II (TRICKY)



15% → 3375

SP_3 [120%] → $\frac{3375}{15} \times 120$

= 27000 (4)

A shopkeeper sells an article at 12% Profit. Had he bought it at a price 10% Less than earlier and sold for ₹ 250 more. he would have gain 30%. Find the cost price of Article?

Solution:— I (BASIC)

Let CP = X ₹

SP1 ↓ SP2 ↓

$X[1.12] + 250 = X[.90][1.30]$

$\Rightarrow X[1.12] + 250 = X[1.17]$

$\Rightarrow X[.05] = 250 \Rightarrow X = 5000$

II (TRICKY)

old		NEW
let CP = 100		90
↓ 12% P		↓ 30% P
SP → 112		117

+5

5 ⟶ 250

∴ CP(100) ⟶ 5000 ANS.

एक दुकानदार एक वस्तु को 20% लाभ पर बेचता है। अगर वह उस वस्तु को 20% पहले से कम पर खरीदे और ₹ 75 कम पर बेचे तो उसे अब 25% का लाभ होता है। तो उस वस्तु का क्रय मूल्य बताओ?

Solution:— I (BASIC)

माना CP = ₹ X

SP1 ↓ SP2 ↓

$X[1.20] - 75 = X[.80][1.25]$

$\Rightarrow X[1.20] - 75 = X[1]$

$\Rightarrow X[.20] = 75$

X = ₹ 375 ANS.

II (TRICKY)

old	−20%	NEW
CP = 100		80
↓ 20% P		↓ 25% P
SP = 120		100

−20

20 ⟶ 75

CP = 100 ⟶ 75 × 5

375 ₹ ANS

A shopkeeper sells his goods at 25% Profit. Had he purchased it for ₹ 900 less and sold for ₹ 900 less he would have gain 5% more. Find the original cost price?

Solution :- I (BASIC) II III (TRICKY)

$$125\% - 900 = \underbrace{(100\% - 900)(1.30)}_{\text{New SP}}$$

(SP = 125%, CP = 100%)

$$1250\% - 9000 = 1300\% - 11700$$

$$\Rightarrow 50\% = 2700$$

$$\therefore 100\% = CP = 5400 \text{ ANS.}$$

$$TRICK = \frac{\text{New Profit}}{P_2 - P_1} \times \text{Gap}$$

$$= \frac{30\%}{5\%} \times 900$$

$$= 5400 \text{ ANS.}$$

एक दुकानदार अपनी वस्तु को 20% लाभ पर बेचता है। यदि वह क्रय मूल्य और विक्रय मूल्य दोनों को 100 ₹ कम कर दे तो उसका लाभ 4% कम जाता है। तो वस्तु का क्र० मू० बताओ ?

Solution :- I (BASIC)

$$20\% \; P = \frac{1 - P}{5 - CP} \quad SP - 6$$

$$CP_1 : SP_1 = 5 : 6$$

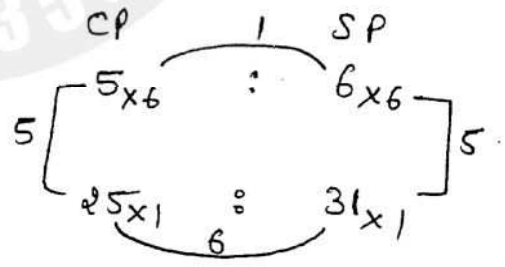
$$24\% = \frac{6 \to P}{25 - CP} \quad SP \to 31$$

$$CP_2 : SP_2 = 25 : 31$$

$$\therefore \frac{5X - 100}{6X - 100} = \frac{25}{31}$$

$$\Rightarrow 5X = 600 \text{ ANS.}$$

II TRICKY



5 unit → 100

30 unit CP → 600 ANS

A shopkeeper sells his goods at a profit of 20%. If he reduces both CP and SP by ₹10 and ₹5 respectively then the profit % ↑ by 10%. Find the cost price of article?

Solution :-

I

$20\%\ P = \frac{1-P}{5-CP} \rightarrow SP-6$

let $CP = 5x$, $SP = 6x$

Now $30\%\ P = \frac{3-P}{10-CP} \rightarrow SP-13$

$\therefore \frac{5x-10}{6x-5} = \frac{10}{13}$

OR $65x - 130 = 60x - 50$

$\Rightarrow 5x = 80 = CP$ ANS

II

$(120\% - 5) = (100\% - 10)(130)$

OR $12000\% - 50 = 13000\% - 130$

$\Rightarrow 100\% = 80$ ANS.

एक दुकानदार एक वस्तु को 25% के लाभ पर बेचता है। यदि वह अपने क्र० मू० और वि० मू० में क्रमशः ₹20 और ₹4 बढ़ा दे तो उसका लाभ 15% बढ़ जाता है। तो वस्तु का क्रय मूल्य ज्ञात करो?

Solution :-

$$(125\% + 4) = (100\% + 20) \times \frac{110}{100}$$

$\Rightarrow 12500\% + 40 = 11000\% + 2200$

$150\% = 180$ $\therefore 100\% = CP = \frac{180}{150} \times 100$

$= 120$ ₹ ANS.

ARTICLE BASED QUESTIONS

Note :- In this type of Question आपको Articles (वस्तुएं) को बराबर रखना होगा।
e.g. if you have 2 articles CP then you must have 2 article SP

Articles were bought at 6 for ₹ 5 and sold for 5 for ₹ 6. Gain/loss percent is?

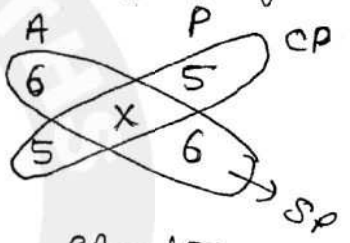
Solution :- I (Basic)

MAKE the Article equal at Lcm of 6, 5 = 30

	A	P	
Buy	5 × 6	5 × 5 = 25	CP
Sold	6 × 5	6 × 6 = 36	SP

$$\text{gain \%} = \frac{11}{25} \times 100 = 44\% \text{ Ans.}$$

II (Tricky)



CP = 25
SP = 36

$$\text{P\%} = \frac{11}{25} \times 100 = 44\%.$$

एक दुकानदार कुछ वस्तुओं को 15 ₹ में 12 वस्तुओं की दर से खरीदता है और सभी वस्तुओं को 14₹ में 10 वस्तुओं के हिसाब से बेच देता है। तो कितने प्रतिशत लाभ या हानि हुई?

Solution :-

	A	P	
Buy	12	15	→ 150 → CP
Sold	10	14	→ 168 → SP

$$\Rightarrow \text{P\%} = \frac{18}{150} \times 100$$

$$= 12\% \text{ Ans.}$$

IF COST PRICE OF 18 articles is equal to selling price of 15 articles. The gain % is?

Solution :- I

let CP of 18 = SP of 15 = 90

⇒ CP of 1 article = 5

⇒ SP of 1 article = 6

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

II

CP of 18 = SP of 15

⇒ $\frac{CP}{SP} = \frac{15}{18} = \frac{5}{6}$

⇒ gain % = $\frac{1}{5} \times 100$

= 20%

अगर a वस्तुओं का क्रय मूल्य 12 वस्तुओं के विo मूo के बराबर हो तो लाभ/हानि % बताइए?

Solution : I

माना CP of 9 = SP of 12 = 36

CP of 1 article = 4

SP of 1 article = 3

loss % = $\frac{1}{4} \times 100$ = 25%

II

CP of 9 = SP of 12

⇒ $\frac{CP}{SP} = \frac{12}{9} = \frac{4}{3}$

⇒ loss % = $\frac{1}{4} \times 100$

= 25%

IIIRD METHOD = $\frac{\#\text{Good LEFT}}{\#\text{Goods Sold}} \times 100$

CP of 18 = SP of 15

% Profit = $\frac{3}{15} \times 100$

= 20% ANS.

CP of 9 = SP of 12

% Loss = $\frac{3}{12} \times 100$

= 25% ANS.

इस Type के questions में आपको focus करना है कि profit/loss SP या CP किसके रूप में given है। अगर PROFIT/LOSS SP के रूप में given है तो 1 article का SP = 1 ₹ मान लो और अगर Profit/loss CP के रूप में given है तो 1 article का CP = 1 ₹ मान लो।

e.g Profit = SP of 11 articles ⇒ let SP of 1 article = 1 ₹

loss = CP of 11 articles ⇒ let CP of 1 = 1 ₹

By selling 33 m of cloth a shopkeeper gains CP of 11 m. find gain %?

Solution :- I

gain = SP − CP

∴ SP of 33 m − CP of 33 m = CP of 11 m

⇒ SP of 33 m = CP of 44 m

⇒ $\frac{CP}{SP} = \frac{33}{44}$

⇒ gain % = $\frac{11}{33} \times 100 = 33\frac{1}{3}\%$

II

let CP of 1 m = 1 ₹

⇒ CP of 33 m = 33 ₹

gain = CP of 11 m = 11 ₹

gain % = $\frac{11}{33} \times 100$

= 33.33% Ans

By selling 33 m of cloth a shopkeeper gains SP of 11 m. find gain %?

Solution :- I

SP of 33 m − CP of 33 m = SP of 11 m

⇒ SP of 22 m = CP of 33 m

⇒ $\frac{CP}{SP} = \frac{22}{33}$ ⇒ gain % = $\frac{11}{22} \times 100$

= 50%

II

let SP of 1 m = 1 ₹

⇒ SP of 33 m = 33 ₹

gain = SP of 11 m = 11 ₹

CP of 11 m = 33 − 11 = 22

gain % = $\frac{11}{22} \times 100$

= 50%

By selling 33 m of cloth a shopkeeper loss CP of 11m. find loss%?

Solution :- I

Loss = CP − SP

CP of 33m − SP of 33m = CP of 11m

⇒ CP of 22m = SP of 33m

⇒ $\frac{CP}{SP} = \frac{33}{22}$

loss% = $\frac{11}{33} \times 100 = 33\frac{1}{3}\%$

II

let CP of 1m = 1 ₹

CP of 33m = 33 ₹

loss = CP of 11m = 11 ₹

loss% = $\frac{11}{33} \times 100$

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

By selling 33 m of cloth a shopkeeper losses SP of 11m. find loss%?

Solution :- I

CP of 33m − SP of 33m = SP of 11m

⇒ CP of 33m = SP of 44m

⇒ $\frac{CP}{SP} = \frac{44}{33}$

loss% = $11/44 \times 100 = 25\%$

II

let SP of 1m = 1 ₹

SP of 33m = 33 ₹

loss = SP of 11m = 11 ₹

⇒ CP of 33m = 33 + 11 = 44

∴ loss% = $\frac{11}{44} \times 100 = 25\%$

36 संतरे क्रय मूल्य के बराबर लाभ होता है। तो लाभ %?

Solution :- I

SP of 36 − CP of 36 = CP of 4

⇒ SP of 36 = CP of 40

⇒ $\frac{SP}{SP} = \frac{36}{40} = \frac{9}{10}$

⇒ P% = $\frac{1}{9} \times 100 = 11\frac{1}{9}\%$

II

माना 1 संतरे का क्र.मू. = 1 ₹

लाभ = 4 संतरे का क्र.मू. = 4

लाभ % = $\frac{4}{36} \times 100$

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

36 संतरे बेचने पर एक दुकानदार को 4 संतरों के विक्रय मूल्य के बराबर लाभ होता है। लाभ % क्या होगा?

Solution :- I (Basic) OR II (TRICKY)

SP of 36 − CP of 36 = SP of 4

⇒ SP of 32 = CP of 36.

OR $\frac{CP}{SP} = \frac{32}{36} = \frac{8}{9}$

लाभ % $= \frac{1}{8} \times 100 = 12.5\%$

माना 1 संतरे का वि०मू० = 1 ₹

लाभ = 4 संतरों का वि०मू० = 4

36 संतरों का वि०मू० = 36

⇒ 36 संतरों का क्र०मू० = 36 − 4 = 32

∴ लाभ % $= \frac{4}{32} \times 100 = 12.5$

36 संतरे बेचने पर एक दुकानदार को 4 संतरों के क्र०मू० के बराबर हानि होती है? हानि प्रतिशत क्या होगा?

Solution :- I (Basic) II (TRICKY)

CP of 36 − SP of 36 = CP of 4

⇒ CP of 32 = SP of 36

⇒ $\frac{CP}{SP} = \frac{36}{32} = \frac{9}{8}$

Loss % $= \frac{1}{9} \times 100 = 11\frac{1}{9}\%$

माना 1 संतरे का CP = 1 ₹

हानि = 4 संतरों का CP = 4 ₹

36 संतरों का CP = 36 ₹

हानि % $= \frac{4}{36} \times 100 = 11\frac{1}{9}\%$

36 संतरे बेचने पर एक दुकानदार को 4 संतरों के विक्रय मूल्यों के बराबर हानि होती है। हानि % क्या होगा?

Solution :- I (BASIC) II (TRICKY)

CP of 36 − SP of 36 = SP of 4

⇒ CP of 36 = SP of 40

OR $\frac{CP}{SP} = \frac{40}{36}$

∴ हानि % $= \frac{4}{40} \times 100$

= 10 % Ans.

माना 1 संतरे का वि०मू० = 1 ₹

हानि = 4 संतरों का SP = 4

36 संतरों का SP = 36

⇒ 36 संतरों का CP = 36 + 4 = 40

हानि % $= \frac{4}{40} \times 100 = 10\%$

A man buys some apples at the rate of 1 Apple for ₹ 2. and equal no. of apples at the rate of 2 apple for ₹ 1. He sells all of them @ 4 apples for ₹ 3 find the profit/loss %?

Solution :-

	Article	Price
← same	2 × 1	2 ₹ × 2 = 4
	2	1 ₹ = 1

CP of 4 = 4 + 1 = ₹ 5

SP of 4 = ₹ 3

$\Rightarrow$ loss % $= \frac{2}{5} \times 100 = 40\%$ Ans

1 दुकानदार कुछ वस्तुओं को 4 ₹ में 3 वस्तुओं की दर से खरीदता है और वह उतनी ही वस्तु 5 ₹ में 4 वस्तु की दर से खरीदता है। इन सभी वस्तुओं को 3 ₹ में 2 वस्तु की दर से बेच देता है। उसे कितने % Profit या loss हुआ?

Solution :-

Article	Price
4 × 3	4 × 4 = 16
3 × 4	5 × 3 = 15

24 वस्तुओं का CP = 31

2 वस्तुओं का SP = 3 ₹

24 वस्तुओं का SP = 3 × 12 = 36

Profit % $= \frac{5}{31} \times 100 = \frac{500}{31}\%$

A shopkeeper purchases oranges 30 for ₹100. How many should he sell in ₹100 to gain 20%?

Solution :- I (Basic)

CP of 30 oranges = 100

SP of 30 " = 100×1.20

= 120 ₹

Now 120 ₹ में — 30 orange

⇒ 100 ₹ में — $\frac{30}{120} \times 100$

— 25 orange

Ans.

II (Tricky)

$E = P \times Q$

$E = 100 = \text{Same}$

$\Rightarrow P \propto \frac{1}{Q}$

	Old	New
Price	100	120
⇒ Qty	120	100

6 : 5 ×5

30 25 Ans.

एक दुकानदार ने 1 ₹ में 25 टॉफियाँ खरीदी। वह 1 ₹ में कितनी टॉफिया बेचे कि उसे 25% का लाभ हो?

Solution :- I (BASIC)

25 टाफियो का क्र०मू०=1

25 टाफियो का वि० मू०=1.25

⇒ 1.25 ₹ में बेचे 25

⇒ 1 ₹ में बेचे $\frac{25}{1.25} = 20$

II (TRICKY)

E = Same = 1 ₹

$P \propto \frac{1}{Qty}$

	Old	New
Price	100	125
Qty	125	100

5 : 4 ×5

25 20 Ans.

Note :→ अगर Sale / Purchase की Price Same है तो Price और Qty का Ratio एक दूसरे का उल्टा होगा। अगर नही Same है तो starting में Same रख लेंगे और बाद में Unitary method का इस्तेमाल करेंगे।

By selling 15 oranges for 1₹ a man loss 20%. How many for 1₹ should he sell to gain 20%?

Solution :- I (Basic)

SP_1 of 15 oranges = 1₹

CP of 15 oranges = $\frac{1}{.80} = \frac{5}{4}$

SP_2 of 15 oranges = $\frac{5}{4} \times 1.20$

= 1.5₹

∴ 1.5₹ में oranges = 15

तो 1₹ में oranges = $\frac{15}{1.5} = (10)$

II (TRICKY)

Exp = Price X Qty

E = Same = 1₹

Price $\propto \frac{1}{\text{Qty}}$

	old	New
Price	80	120
Qty	120	80
	3	2

$5 \times \left(\frac{1}{15}\right) \times 5$

(10) ANS.

By selling 45 oranges for ₹ 40 a man loss 20%. How many should he sell for ₹ 24 to earn 20%?

Solution :- I (Basic)

SP_1 of 45 oranges = 40

CP of 45 " = $\frac{40}{.80} = 50$

SP_2 of 45 oranges = 50×1.20

= 60₹

∴ 60₹ में oranges 45 संतरे

तो 1₹ में oranges $\frac{45}{60}$

और 24₹ में oranges = $\frac{45}{60} \times 24$

= (18)

II (Tricky)

Sale Price ≠ Purchase/sale

40 24

[but हम पहले 40 का निकाल लेंगे (same रख के) बाद में 24 का unitary से]

	old	New
Price	80	120
Qty	120	80
	3	2

$15 \times \left(\begin{matrix}3\\45\end{matrix} : \begin{matrix}2\\30\end{matrix}\right) \times 15$

40₹ में — 30

24₹ में — $\frac{30}{40} \times 24 = (18)$

MARKED PRICE / LIST PRICE / TAG PRICE / LABELLED PRICE
(अंकित मूल्य) M.R.P / Print Price
Price that is printed on the tag of article

Discount (बट्टा / छूट)

Discount = MP − SP = अं मू० − वि० मू०

Discount % हमेशा अंकित मू० पर ज्ञात किया जाता है।
D% is always calculated/Reckoned on MP unless otherwise stated.

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

Selling Price (S.P.) = M.P. $\times \frac{(100 - D\%)}{100}$

OR $M.P. = SP \times \frac{100}{(100 - D\%)}$

Note :- discount is always given by Shopkeeper.
and if no discount $\Rightarrow$ MP = SP

MARK UP %

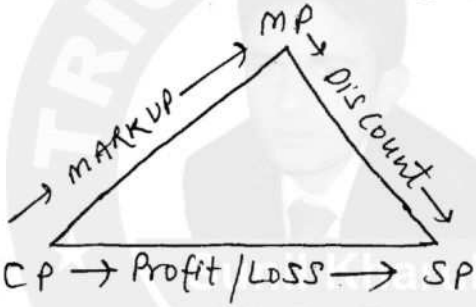
$$\text{MARK UP} = MP - CP$$

Note:- MARK UP % is always calculated on cost price.

$$\text{MARK UP \%} = \frac{\text{MARK UP}}{CP} \times 100$$

e.g $CP = 100$, $MP = 150 \Rightarrow$ MARK UP % $= 50\%$

Relation Ship b/w CP, SP & MP



let $P\% = 20\%$ and $D = 25\%$

$\therefore CP * (1.20) = SP$ — (1)

also $MP * (.75) = SP$ — (2)

from (1) and (2), we get

$$CP(1.20) = MP(.75)$$

100% METHOD [TAKE MP = 100%]

D = 20% → MP = 100%

→ SP = 80%

e.g. SP = ₹ 720, D% = 10% MP = ?

D = 10% ⇒ MP = 100%

SP = 90%

90% → 720

⇒ 100% → $\frac{720}{90} \times 100 = 800$ ANS.

Ratio METHOD

D = 10% = $\frac{1 \rightarrow \text{discount}}{10 \rightarrow \text{MRP}}$ ⇒ SP = 10 − 1 = 9

e.g. D = 10%, SP = 720, MP = ?

D = 10% = $\frac{1 \rightarrow D}{10 \rightarrow MP}$ ⇒ SP = 10 − 1 = 9

9 units → 720

MP = 10 units → $\frac{720}{9} \times 10 = 800$ ANS.

D = 12.5% MP = 1600, SP = ?

D = 12.5% = $\frac{1 \rightarrow D}{8 \rightarrow MP}$ ⇒ SP = 7

8 units → 1600

SP = 7 units → 1400 ANS.

Discount

I — SUCCESSIVE DISCOUNT (50% + 40%)

II — MP, SP, CP (SP will be same)

III — ARTICLE BASED (Buy 2 get 1 Free)

Find the equivalent discount for 50% + 40%?

Solution:- I

$$X + Y + \frac{XY}{100}$$

$X = -50,\ Y = -40$

$$= -50 - 40 + \frac{2000}{100}$$

$= -70$ — 70% Ans.

II

Let MP = 100

70% ← -50% → 50 → -40% → 30

III

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

$40\% = -\frac{2}{5}$

old	New
2	1
5	3
10	3

70% D

If two successive disc count of 60% + X% equivalent disc count is 72%. Find X?

Solution → I

$$-72 = -60 - X + \frac{60X}{100}$$

$X = 30\%$

II

MP 100 —60% D→ 40

100 —72%→ 28

$\frac{12}{40} \times 100 = 30\%$ Ans

which offer is better (i) 60% + 30%
(ii) 70% + 20%

Solution → Total is same = 60 + 30 = 70 + 20 = 90

जिसकी numericle value बड़ी होगी वही ज्यादा disc count होगा। (ii) is better coz of 70%