

 TARGET CAT 2025 



MBA FASTRACK

QUANT : Arithmetic

Profit Loss Discount

Lecture No.- 04

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Recap of Previous Lecture :

$$\begin{array}{c} \text{SI} \\ \text{CI} \end{array} \quad \frac{\text{Prnt}}{100} \quad 20\% \text{ @ } 3\%.$$

$$\boxed{20\% \quad 20\%} \quad T \cdot \text{Int} = 60\%$$

$$a + b + \frac{ab}{100}$$

$$20 + 20 + \frac{400}{100} = 54\%$$

TOPICS *to be covered*



- 1) Numerical based on 'SI & CI'
- 2) Concept & Numerical based on 'Profit & Loss'
- 3) Concept & Numerical based on 'Marked Price & Discount'
- 4) Concept & Numerical based on 'Faulty Weight Balance'
- 5) Problems for Practice & CAT PYQs

QUESTION-1

$$D_I : D_{II} = 2 : 1$$

$$t = 1$$

$$SI = \frac{P \cdot t}{100}$$



#Q. A person invested a total amount of Rs 15 lakh. A part of it was invested in a fixed deposit earning 6% annual interest, and the remaining amount was invested in two other deposits in the ratio 2 : 1, earning annual interest at the rates of 4% and 3%, respectively. If the total annual interest income is Rs 76000 then the amount (in Rs lakh) invested in the fixed deposit was [TITA] g [CAT 2019 : Slot 1]

$$\begin{aligned} T \cdot \text{Investment} &= 1500000 \\ (T \cdot P_{\text{initial}}) &\\ F-D &\\ D_I &\\ D_{II} &\\ r = 6\% \cdot P \cdot t &\\ P = (1500000 - 3n) &\\ P = 2n &\\ P = 1n &\\ r = 4\% &\\ r = 3\% &\\ P = 15L - 6L &\\ = 9L & \end{aligned}$$

$$\begin{aligned} T \cdot SI &= 76000 \\ \frac{(1500000 - 3n) \times 6 \times 1}{100} + \frac{2n(4)(1)}{100} + \frac{1n(3)(1)}{100} &= 76000 \\ \frac{9000000 - 18n + 8n + 3n}{100} = 76000 &= 76000 \\ -7n + 900000 = 760000 & \\ 1400000 = 7n & \\ 200000 = k & \end{aligned}$$

QUESTION- 2

Amt

#Q. A person invested a certain amount of money at 10% annual interest, compounded half-yearly. After one and a half years, the interest and principal together became Rs. 18522. The amount, in rupees, that the person had invested is

[CAT 2020 : Slot 3]

$$\textcircled{CI} \text{ half yearly}$$

$$\times \frac{R=10\%}{P} \Rightarrow r = \frac{10}{2} = 5\% \text{ per half year}$$

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

$$A = 18522$$

$$\textcircled{S.I.} \quad S.I. \quad S.I. \quad S.I.$$

$$P \times \frac{105}{100}^{\frac{21}{2}} \times \frac{105}{100}^{\frac{21}{2}} \times \frac{105}{100}^{\frac{21}{2}} = 18522$$

$$P = \frac{18522}{\frac{105}{100}^{\frac{21}{2}} \times \frac{105}{100}^{\frac{21}{2}} \times \frac{105}{100}^{\frac{21}{2}}}$$

$$P = 16000$$



Profit - Loss - Discount



Profit & Loss :



$CP \rightarrow$ Cost Price

$SP \rightarrow$ Selling Price

$$CP = 70$$

$$SP = 90$$

$(SP > CP) \rightarrow$ Profit

$$\boxed{P = SP - CP}$$

$$= 90 - 70$$

$$= 20$$

$$CP = 70$$

$$SP = 65$$

$\boxed{SP < CP} \rightarrow$ Loss

$$\boxed{L = CP - SP}$$

$$= 70 - 65$$

$$= 5$$

$$\boxed{CP = SP}$$

Break Even Point
(No Profit No Loss)

20% ↑

Profit & Loss :

Method I

Actual

$$\begin{array}{l} SP = \underline{\underline{300}} \\ P = 20\% \\ CP = ? \end{array}$$

Method II

Actual

$P\% \text{ or } L\% \rightarrow CP$

Assume → Act

$$\begin{array}{rcl} 120 & \xrightarrow{X} & 300 \\ 100 & \xrightarrow{V} & \end{array}$$

$$120x = 3000$$

Assumption

$$\begin{array}{l} SP - CP = P \\ SP = CP + P \end{array}$$

$$\begin{array}{l} CP \rightarrow 100 \\ + P(20\%) \quad 20 \\ \hline SP \quad 120 \end{array}$$

$$\begin{array}{l} n = \frac{3000}{12} \\ x = 250 \\ \downarrow \\ \text{Actual CP} \end{array}$$

Method II

$$\begin{array}{l} SP = 120 \% \cdot CP \\ \frac{300}{250} = \frac{120}{100} \\ 250 = CP \end{array}$$

$$\left\{ \begin{array}{l} 120 + 20 \\ 100 + P \end{array} \right.$$

Profit & Loss :

Method I

$$\begin{array}{l} \text{Act} \\ \boxed{CP = ?} \\ SP = 180 \\ \boxed{L = 10\%} \end{array}$$

$$L = CP - SP$$

$$\boxed{SP = CP - L}$$

$$\begin{array}{rcl} \text{let.} & CP & 100 \\ & - L(10)\% & 10 \\ \hline & SP & \boxed{90} \end{array}$$

$$\begin{array}{l} \text{Assume} \quad \sqrt{s} \quad \text{Act} \\ g_0 \xrightarrow{x_2} 180 \\ 100 \rightarrow h = 200 \\ x_2 \end{array}$$

$$\begin{array}{l} g_0 n = 18000 \\ n = 200 \end{array}$$

Method II

$$\begin{array}{l} (100 - 10) \\ (100 - L) \end{array}$$

$$SP = \boxed{g_0} \cdot / \cdot CP$$

$$\begin{array}{l} 180 = \frac{SP}{100} \cdot CP \\ 180 = \frac{g_0}{100} \cdot CP \end{array}$$

$$\boxed{200 = CP}$$



Profit & Loss :



Find P.I. or L.I.

$$P.I. = \frac{\text{Profit}}{C.P} \times 100$$

$$L.I. = \frac{\text{Loss}}{C.P} \times 100$$

Find P.I. over SP or L.I. over SP

$$P.I. = \frac{\text{Profit}}{S.P} \times 100$$

$$L.I. = \frac{\text{Loss}}{S.P} \times 100$$

QUESTION- 3
 \underline{SP}

$$\underline{\underline{SP_I = SP_{II}}}$$

#Q. Find the selling price of watch if two salesman claim to make 20% profit each, one calculating it on cost price while another on the selling price, the difference in the profits earned being Rs. 160 and selling price being the same in both the case?

$$\boxed{\text{Diff in Profit} = \underline{\underline{160}}}$$

$$\textcircled{I} \quad [\text{on } CP] \\ \text{Profit} = 20\% \\ CP = ?$$

$$\textcircled{II} \quad [\text{on } SP] \\ \text{Profit} = 20\% \\ SP = ?$$

$$\text{let, } CP = 100 \\ + \frac{P(20\%)}{SP} = 20 \\ \frac{100}{SP} = 20 \\ SP = 120 \\ \therefore \underline{\underline{\text{Profit}}} = \frac{20}{120} \times 120 = 20 \\ \text{Diff} = 5$$

$$4 \rightarrow 160 \\ \times \\ 120 \rightarrow n \\ \therefore n = \frac{160}{4} \times 120 \\ n = 4800$$

- A** Rs. 4000
- B** Rs. 3200
- C** Rs. 3600
- D** Rs. 4800

QUESTION- 4

#Q. Sonali buys 2 Pen Drives A and B and their cost price is in the ratio of 5:6 respectively. If she sells them on 10% profit each, she earns total profit of ₹ 22. What will be her total profit, if she sells Pen Drive A on 20 % loss and Pen Drive B on 30% profit?

A

Rs. 16

B

Rs. 13

C

Rs. 14

D

Rs. 24

$$\begin{aligned} CP_A : CP_B \\ 5 : 6 \end{aligned}$$

Assume

$$\text{let, } CP_A = 50 \xrightarrow{P=10\%} \frac{\text{Profit}}{5}$$

$$CP_B = 60 \xrightarrow{P=10\%} \frac{\text{Profit}}{6}$$

(11) → Total Profit

$$\begin{aligned} 11 &\xrightarrow{+2} 22 \\ 50 &\xrightarrow{+2} 100 \\ \therefore CP_A &= 100 \end{aligned}$$

$$\begin{aligned} 11 &\xrightarrow{+2} 22 \\ 60 &\xrightarrow{+2} 120 \\ \therefore CP_B &= 120 \end{aligned}$$

$$CP_A = 100 \xrightarrow{L=20\%} 20 (\text{Loss})$$

$$CP_B = 120 \xrightarrow{P=30\%} 36 (\text{Profit})$$

$$36 - 20 = 16$$

QUESTION- 5

#Q. The selling price of a product is fixed to ensure 40% profit. If the product had cost 40% less and had been sold for 5 rupees less, then the resulting profit would have been 50%. The original selling price, in rupees, of the product is

[CAT 2024 : Slot 1]

Let, $\text{CP} = 100$

$$\frac{\text{Profit}}{\text{SP}} = 40\% \quad \text{New CP} = 60$$

$$\frac{\text{Profit} + 50\%}{\text{New SP}} = 50\%$$

$$50 \rightarrow \text{Rs. } 5$$

$$140 \rightarrow n$$

$$\text{SP} = 140 \times \frac{n}{15}$$

$$n = 15$$

- A 10
- B 15
- C 20
- D 14

Concept of Marked Price & Discount:

Marked Price [MP / MRP / List Price / Catalogue Price / Printed Price / Tag Price
 Label Price]

$$\begin{aligned}
 & MP = 2000 \\
 & - Disc = 500 \\
 & \frac{SP}{MP} = \frac{1500}{2000} \\
 & SP = 1500
 \end{aligned}$$

$MP > SP$

$SP > CP$ $CP > SP$ $MP > SP$

$CP + P$	$CP - L$	$MP - Disc$
$\frac{SP}{CP}$	$\frac{SP}{CP}$	$\frac{SP}{MP}$

$MP > SP$

$Disc \neq 0$

Concept of Marked Price & Discount:

10% ↓

I

Assn.

Act. SP = 180

Disc = 10%

MP = ?

Let MP = 100

$$\frac{\text{Disc}(10\%)}{\text{SP}} = \frac{10}{\text{MP}}$$

100 → ×2 = 200

180 → ×2 = 360

360 = MP × 100

360 = MP

MP = 360

MP = g0

Disc % = Disc / MP × 100

Disc % = Disc / g0 × 100

II

MP or CP → CP

Disc % → MP

(100 - Disc) / 100

QUESTION- 6

#Q. A shopkeeper allows a discount of 12.5% on the marked price of a certain article and makes a profit of 20%. If the article cost the shopkeeper Rs. 210, what price must be marked on the article?

$$\boxed{\begin{array}{c} CP \\ + P \\ \hline SP \end{array}}$$

~~$$\boxed{\begin{array}{c} CP \\ - \cancel{P} \\ \hline SP \end{array}}$$~~

~~$$\boxed{\begin{array}{c} MP \\ - \cancel{Disc} \\ \hline SP \end{array}}$$~~

$$\text{Disc} = 12.5\% \leftarrow$$

$$P = 20\% \leftarrow$$

$$CP = 210$$

$$MP = ?$$

$$\begin{array}{c} \xrightarrow{\text{Actual}} \\ CP = 210 \\ + P(20\%) = 42 \\ \hline SP = 252 \end{array}$$

A Rs. 280

B Rs. 288

C Rs. 300

D None of these

$$SP = (100 - \text{Disc}) \cdot MP$$

$$252 = \frac{87.5}{100} \cdot MP$$

$$\frac{25200}{87.5} = MP$$

$$288 = MP$$

QUESTION- 7

#Q. Gopi marks a price on a product in order to make 20% profit. Ravi gets 10% discount on this marked price, and thus saves Rs 15. Then, the profit, in rupees, made by Gopi by selling the product to Ravi, is [CAT 2024 : Slot 2]



Actual Saving of Ravi = Rs. 15

$$\text{Let, } CP = \underline{\underline{100}}$$

$$+ 20\% = 20\lambda$$

$$\underline{\underline{120}}$$

25

B

15

D

20

$$= \frac{20\%}{100} = \underline{\underline{12}}$$

$$\underline{\underline{108}}$$

$$\therefore \text{Profit of Gopi} = SP - CP$$

$$= \underline{\underline{108}} - \underline{\underline{100}} \\ = \underline{\underline{8}}$$

$$12 \rightarrow \text{Rs. 15}$$

$$8 \cancel{\rightarrow} \cancel{1}$$

$$12 \cancel{\times} = \underline{\underline{120}}$$

$$\cancel{12} = \underline{\underline{10}}$$

Concept of Faulty Weight Balance:

[Quantity platform should be same]

Example: A dishonest dealer professes to sell his goods at cost price but uses a weight of 960 gm instead of a kg weight. Find the gain of this dishonest person in percent.

↓
(1000 gm)

$$\text{Let, } CP = \text{Rs. } 100 / 1000 \text{ gm}$$

$$1000 \text{ gm} \rightarrow 100$$

$$960 \text{ gm} \rightarrow 96$$

$$\therefore CP = \text{Rs. } 96 / 960 \text{ gm}$$

$$SP = \text{Rs. } 100 / 960 \text{ gm}$$

$$\begin{aligned} P &= 100 - 96 \\ &= 4 \end{aligned}$$

$$\begin{aligned} P\% &= \frac{P}{CP} \times 100 = \frac{4}{96} \times 100 = \frac{100}{24} = \frac{25}{6} = \frac{25}{6}\% \end{aligned}$$

QUESTION- 8

$$1m = 100 \text{ cm}$$

per 100cm



#Q. A merchant purchases a cloth at a rate of Rs.100 per meter and receives 5 cm length of cloth free for every 100 cm length of cloth purchased by him. He sells the same cloth at a rate of Rs.110 per meter but cheats his customers by giving 95 cm length of cloth for every 100 cm length of cloth purchased by the customers. If the merchant provides a 5% discount, the resulting profit earned by him is [CAT 2023 : Slot 3]

A

4.2%

B

15.5%

C

16%

D

9.7%

$$\begin{aligned} CP &= \underline{\underline{\text{Rs. 100}} / \underline{\underline{105 \text{ cm}}}} \\ 105 \text{ cm} &\rightarrow \underline{\underline{\text{Rs. 100}}} \\ 95 \text{ cm} &\rightarrow \underline{\underline{K}} \\ 105 \text{ m} &= 95 \text{ m} \\ CP &= K = \frac{95}{105} = \underline{\underline{90.47}} \quad | \quad 95 \text{ cm} \\ MP &= \underline{\underline{\text{Rs. } 110}} / \underline{\underline{95 \text{ cm}}} \\ \text{Disc} (\text{S.I.}) &= 5.5 \\ SP &= \underline{\underline{104.5}} \quad | \quad 95 \text{ cm} \\ P_{\text{Profit}} &= SP - CP \\ &= 104.5 - 90.47 \\ &= 14.03 \end{aligned}$$

$$\begin{aligned} \text{P.I.} &= \frac{P}{CP} \times 100 \\ &= \frac{14.03}{90.47} \times 100 = \underline{\underline{15.5}} \end{aligned}$$



Problems for Practice [CAT PYQs] :

QUESTION- 9

$$T \cdot \text{Profit Minu} = \text{Rs. } 500$$

M → K = 200
M → T = 300

#Q. Minu purchases a pair of sunglasses at Rs.1000 and sells to Kanu at 20% profit. Then, Kanu sells it back to Minu at 20% loss. Finally, Minu sells the same pair of sunglasses to Tanu. [If the total profit made by Minu from all her transactions is Rs.500,] then the percentage of profit made by Minu when she sold the pair of sunglasses to Tanu is

A 35.42 %	M → K $\text{CP} = 1000$ $\frac{\text{P}}{(20\%)} = 200$ $\frac{\text{P}}{\text{SP}_M} = \frac{200}{1200}$	K → M $\text{CP}_K = 1200$ $(20\%) = 240$ $\frac{\text{P}}{\text{SP}_K} = \frac{240}{960}$	M → T [CAT 2023 : Slot 2] $\text{CP}_M = 960$ $\text{Profit} = 500 - 200 = 300$ $\text{P. I.} = \frac{\text{P}}{\text{CP}} \times 100$ $= \frac{300}{960} \times 100 = \frac{30000}{96} = 31.25\%$
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QUESTION- 10

#Q. Gita sells two objects A and B at the same price such that she makes a profit of 20% on object A and a loss of 10% on object B. If she increases the selling price such that objects A and B are still sold at an equal price and a profit of 10% is made on object B, then the profit made on object A will be nearest to [CAT 2023 : Slot 1]

A 42 %

$$CP_A = x$$

$$SP_A = 1.2x$$

$$CP_B = y$$

$$SP_B = 0.9y$$

B 47 %

let.

$$CP_A = x = 300$$

$$CP_B = y = 500$$

$$SP_A = SP_B$$

$$1.2x = 0.9y$$

$$\frac{x}{y} = \frac{0.9}{1.2} = \frac{3}{4}$$

$$\frac{x}{y} = \frac{3}{5}$$

C 45 %

D 49 %

$$CP_A = 300$$

$$+ p = 140$$

$$SP_A = 440$$

$$CP_B = 500$$

$$+ p (10\%) = 50$$

$$p = \frac{140}{300} \times 100$$

$$= 46.66$$

$$= 47.1$$

$$SP_A = SP_B$$

QUESTION- 11

#Q. Mukesh purchased 10 bicycles in 2017, all at the same price. He sold six of these at a profit of 25% and the remaining four at a loss of 25%. If he made a total profit of Rs. 2000, then his purchase price of a bicycle, in Rupees, was [CAT 2019 : Slot 2]

$$\begin{array}{c}
 \text{Total Quantity} = 10 \\
 \text{Profit} \quad \quad \quad \text{Loss} \\
 6 @ 25 \quad \quad \quad 4 @ 25 \\
 = (150) \text{ Profit} \quad = (100) \text{ Loss} \quad \times_2 \quad \begin{array}{l} 50 \rightarrow 2000 \\ 100 \rightarrow x = 4000 \end{array} \quad \times_2 \\
 \therefore \text{Net Profit} = 150 - 100 \\
 = 50
 \end{array}$$

- A** 2000
- B** 6000
- C** 8000
- D** 4000

QUESTION- 12

#Q. A shopkeeper sells two tables, each procured at cost price p , to Amal and Asim at a profit of 20% and at a loss of 20%, respectively. Amal sells his table to Bimal at a profit of 30%, while Asim sells his table to Barun at a loss of 30%. If the amounts paid by Bimal and Barun are x and y , respectively, then $(x - y)/p$ equals

[CAT 2019 : Slot 2]

$$\begin{array}{c}
 \text{Let, } CP/\text{Table} = p = 100 \\
 \swarrow 20\% \uparrow \quad \searrow 20\% \downarrow \\
 \begin{array}{ll}
 \text{Amal} & \text{Asim} \\
 (100 + 20) & (100 - 20) \\
 = 120 & = 80
 \end{array}
 \end{array}$$

$+30\% \uparrow$
 $(-25\%) \downarrow$

A ✓
B 1.2
C 0.7
D 0.5

$$\begin{aligned}
 \frac{x - y}{p} &= \frac{156 - 56}{100} \\
 &= \frac{100}{100} \\
 &= 1
 \end{aligned}$$

QUESTION- 13

#Q. A man buys 35 kg of sugar and sets a marked price in order to make a 20% profit. He sells 5 kg at this price, and 15 kg at a 10% discount. Accidentally, 3 kg of sugar is wasted. He sells the remaining sugar by raising the marked price by p percent so as to make an overall profit of 15%. Then p is nearest to [CAT 2020 : Slot 3]

TRY
(Next class)

A 22

B 35

C 31

D 25



2 Mins Summary

- 1) Numerical based on 'SI & CI'
- 2) Concept & Numerical based on 'Profit & Loss'
- 3) Concept & Numerical based on 'Marked Price & Discount'
- 4) Concept & Numerical based on 'Faulty Weight Balance'
- 5) Problems for Practice & CAT PYQs



Thank
You