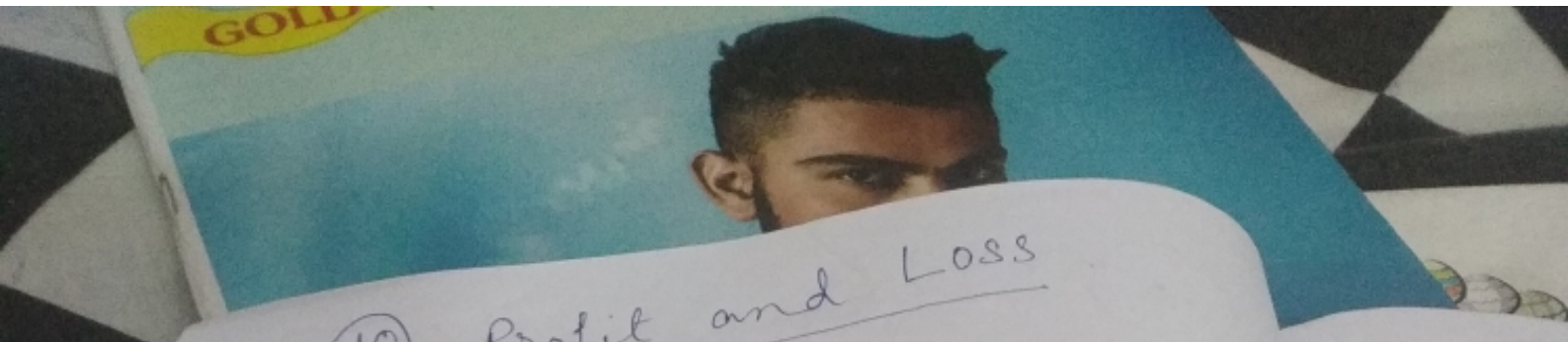

(10) Profit and Loss

Formulae :

1. Profit = SP − CP
2. Loss = CP − SP
3. Profit % = $\frac{\text{Profit}}{CP} \times 100$

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

4. Loss % = $\frac{\text{Loss}}{CP} \times 100$

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

5. Profit = − Loss.

SP > CP ⇒ Profit

CP > SP ⇒ Loss

CP
10 →
100 →

3. SP =
Loss
CP
We ha

3. SP = Rs 176
Loss = 12 %
CP = ? Let, CP = ₹ x

We have, $\text{Loss}\% = \frac{CP - SP}{CP} \times 100$

or, $12 = \frac{x - 176}{x} \times 100$

or, $12x = (x - 176) \times 100$

or, $12x = 100x - 17600$

or, $12x - 100x = -17600$

or, $-88x = -17600$

or, $x = \frac{17600}{88} = 200$

$\therefore$ Required cost price = ₹ 200

4. CP of 1 lemon = ₹ $\frac{30}{10}$ = ₹ 3

and SP of 12 lemons = ₹ 42

$\therefore$ SP of 1 lemon = ₹ $\frac{42}{12}$ = ₹ $\frac{7}{2}$

$\therefore$ Profit in 1 lemon = SP − CP

= ₹ $\left(\frac{7}{2} - 3\right)$

= ₹ $\frac{1}{2}$

Req Profit % = $\frac{\frac{1}{2}}{3} \times 100 = \frac{1}{6} \times 100 = \frac{50}{3} = 16\frac{2}{3}$

5. Let, CP = ₹ x

20% Loss = $\frac{CP - SP}{CP} \times 100$

or, $20 = \frac{x - SP}{x} \times 100$

or, $20x = (x - SP) \times 100$

or, $20x = 100x - 100.SP$

or, $20x - 100x = -100.SP$

or, $-80x = -100.SP$

or, $100\,SP = 80x$

$\therefore SP = \frac{\cancel{80}}{\cancel{100}_5} x = \frac{4x}{5}$

Again, when CP = ₹ x and

$SP = ₹\left(\frac{4x}{5} + 200\right)$

5% profit

ATP $\frac{SP - CP}{CP} \times 100 = 5$

or, $\frac{\frac{4x}{5} + 200 - x}{x} \times 100 = 5$

or, $\frac{\frac{4x + 1000 - 5x}{5}}{x} \times 100 = 5$

or, $\frac{1000 - x}{5x} \times$

or, $(1000 - x)$

or, $100000 -$

or, $+125x$

or, $x =$

$\therefore$ Requir

6. Let, C

ATP 3

or, $-x$

or, $+$

$\therefore$ Re

7. Le

$\therefore$ 15

discount

=

AT

or, $\frac{1000-x}{5x} \times 100 = 5$

or, $(1000-x) \times 100 = 25x$

or, $100000 - 100x = 25x$

or, $+125x = +100000$

or, $x = \frac{100000}{125} = 800$

∴ Required CP = ₹ 800

6. Let, CP = Rs x

ATP $370 - x = x - 210$

or, $-x - x = -210 - 370$

or, $-2x = -580$

$x = \frac{580}{2} = 290$

∴ Req CP = ₹ 290

7. Let, MP = ₹ x

~~15% disc~~ 15% discount of ₹ x

discount $= \frac{15x}{100}$ ∴ SP $= x - \frac{15x}{100} = \frac{85x}{100}$

ATP $\frac{85x}{100} = 255$ or, $85x = 25500$

or, $x = \frac{25500}{85} = 300$

∴ Required marked price = ₹ 300

(8) Let, written price = ₹ x.

∴ 25% discount = ₹ $\frac{25x}{100}$ = ₹ $\frac{x}{4}$

∴ C.P = W.P − discount

= ₹ $(x - \frac{x}{4})$ = ₹ $\frac{3x}{4}$

Again SP = ₹ x $(\because SP = W.P)$

∴ Profit = ₹ $(x - \frac{3x}{4})$

= ₹ $\frac{x}{4}$

∴ Profit % = $\frac{\text{Profit}}{CP} \times 100$

= $\frac{\frac{x}{4}}{\frac{3x}{4}} \times 100 = 33\frac{1}{3}$ %

(9) CP of total 150 eggs = ₹ 150 × 5

= ₹ 750

Now 8 eggs are broken and 7 eggs are rotten.

∴ Remaining eggs = 150 − (7 + 8)

= 135

SP of 125 [illegible] = ₹(125×6) = ₹750

Profit = ₹(750 − 750) = ₹60

∴ Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100$

$= \frac{60 \times 100}{750} = 8$

∴ Profit = 8%.

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(116) SP of 12 commodities = Re 1

loss = 4%, Let CP = ₹x

ATP $\frac{CP - SP}{CP} \times 100 = 4$

or, $\frac{x-1}{x} \times 100 = 4$

or, $25(x-1) = x$

or, $25x - x = 25$

or, $24x = 25$

or, $x = \frac{25}{24}$

∴ CP of 12 commodities = $\frac{25}{24}$.

Now profit = 44%.

Let, that time SP = ₹y

ATP $\frac{SP - CP}{CP} \times 100 = 44$

or, [illegible]

$$\text{or, } \frac{y - \frac{25}{24}}{\frac{25}{24}} \times 100 = 44$$

$$\text{or, } \frac{24y - 25}{25} \times 100 = 44$$

$$\text{or, } 24y - 25 = 11$$

$$\text{or, } 24y = 11 + 25 = 36$$

$$\therefore y = \frac{36}{24} = \frac{3}{2}$$

~~∴ SP of 12 commodities = ₹ 3/2~~

~~∴ SP of 1 " = ₹ 3/2 × 1/12~~

∴ ₹ $\frac{3}{2}$ is the SP of 12 commodities

⇒ Re 1 " " " $12 \times \frac{2}{3} = 8$ "

∴ Required number of commodities

= 8.

13. CP of 1 toffee = ₹ $\frac{2}{15}$

Let, total no. of toffees = $2x$

∴ CP of x toffees = ₹ $\frac{2x}{15}$

Again $\frac{x}{2}$ toffees he sold at Re 1 for 5 toffees

∴ SP of $\frac{x}{2}$ toffees = ₹ $\frac{1}{5} \times \frac{x}{2}$ = ₹ $\frac{x}{10}$

Another $\frac{x}{2}$ toffees he sold at Re 1 for 10 toffees.

∴ SP of $\frac{x}{2}$ toffees = ₹ $\frac{1}{10} \times \frac{x}{2}$ = ₹ $\frac{x}{20}$

∴ Total SP = ₹ $\left(\frac{x}{10} + \frac{x}{20}\right)$ = ₹ $\frac{3x}{20}$

∴ Profit = SP − CP

= ₹ $\left(\frac{3x}{20} - \frac{2x}{15}\right)$

= ₹ $\frac{9x - 8x}{60}$ = ₹ $\frac{x}{60}$

∴ Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100$

= $\frac{\frac{x}{60}}{\frac{2x}{15}} \times 100$ = $\frac{x}{60_4} \times \frac{15}{2x} \times 100^{25}$

= $\frac{25}{2}$ = 12·50 %

∴ Req. profit = 12·50 %. Ans

14. Marked price of each chair

For the first chair,

8% discount on ₹1250

S.P of the first chair

$= ₹\left(1250 - \frac{8}{100} \times 1250\right)$

$= ₹(1250 - 100) = ₹1150$

~~Now for the 2nd chair~~

15% profit

$\frac{SP - CP}{CP} \times 100 = 15$

$\Rightarrow \frac{1150 - CP}{CP} \times 100 = 15$

or, $(1150 - CP)100 = 15\,CP$

or, $115\,CP = 115000$

$\therefore CP = \frac{115000}{115} 1000 = 1000$

$\therefore CP = ₹1000$
$SP = ₹1150$
} → 1st chair
Profit = ₹150

For the 2nd ch

CP = ₹ 1000

SP = ₹ 1120

Profit = ₹ 12

Total profit

Total CP =

∴ Profit

∴ Requ

For the 2nd chair

CP = ₹ 1000

SP = ₹ 1120

Profit = ₹ 120

∴ Total profit = ₹ 150 + ₹ 120

= ₹ 270

Total CP = ₹ 2000

∴ Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100$

= $\frac{270}{2000} \times 100$

= $\frac{27}{2} = 13.5$

∴ Required total profit = 13.50%.

(15) MP = ₹ 36·50
Discount = ₹ 2·40
SP = Rs (36·50 − 2·40)
= Rs 34·60
Profit % = 12 ; let CP = ₹ x

$$\frac{34.60 - x}{x} \times 100 = 12$$

$$\therefore 12x = (34.60 - x)100$$

$$\text{or. } 112x = 34.60 \times 100 = 3460$$

$$\therefore x = \frac{3460}{112} = 30$$

∴ CP of the pen = ₹ 30.

He sold to Mita at ₹ 34·50.

∴ Profit = ₹ (34·50 − 30)
= ₹ 4·50

$$\therefore \text{Profit \%} = \frac{4.50}{30} \times 100$$

$$= \frac{15}{\cancel{30}} \cancel{450} = 15$$

∴ Required profit = 15 %

16. Total production price or cost price of 2000 copies of books = ₹ (3875 + 3315 + 810)
= ₹ 8000

Profit = 20% on CP

$= ₹ \frac{20}{100_5} \times \overset{1600}{8000} = ₹ 1600$

∴ SP = CP + Profit

= ₹ (8000 + 1600) = ₹ 9600

let, marked price of each book = ₹ x

Discount = 20%.

∴ Discount = $₹ \frac{20}{100} \times x = ₹ \frac{x}{5}$

~~∴ Marked price of each book = SP + disc.~~

∴ SP of each book = MP − Disc

$= ₹ (x - \frac{x}{5}) = ₹ \frac{4x}{5}$

∴ SP of 2000 books $= ₹ \frac{4x}{5} \times \overset{400}{2000}$

$= ₹ 1600x$.

ATP, $1600x = 9600$

or, $x = \frac{\overset{6}{9600}}{\underset{4}{1600}} = 6$

∴ Req. marked price of each book = ₹ 6.

17. $SP_1 = ₹1248$, Profit = 4%. Let, $CP_1 = ₹x$

$$100 \times \frac{1248 - x}{x} = 4$$

or, $100(1248 - x) = 4x$

or, $+104x = +124800$

$\therefore x = \frac{124800}{104} = ₹1200$

$\therefore CP_1 = ₹1200$ ✓

Again, let, ~~$SP_2 = ₹y$~~ ~~$CP_2 = ₹1248$~~

~~$CP_2 = ₹y$~~, ~~$SP_2 = ₹1248$~~

Loss = 4% $CP_2 = ₹y$ $SP_2 = ₹1248$

$\therefore \frac{y - 1248}{y} \times 100 = 4$

or, $100y - 124800 = 4y$

or, $96y = 124800$

$\therefore y = \frac{124800}{96} = 1300$

$\therefore CP_2 = ₹1300$

$\therefore$ Total CP = ₹(1200 + 1300)

Total SP = ₹2496 = ₹2500

$\therefore$ Loss = CP − SP = 2500 − 2496

= ₹4.

18.