

Section-A (Percentage)

① $ON = 100$

20% increase

$ON = 120$

decrease of 20%

20% of 120

$100 - 20 = 80 \Rightarrow 4\% \text{ decrease}$

③ $\frac{125 - 100}{125} \times 100 = 20\%$

② $P \times 1.1 \times 1.1 = 12100$

$P = \frac{121000}{1.21} = 100000$

④ $0.9V$

$0.6 \times 0.9V = 0.54V$

⑤ $0.25M + 30 = 0.6M - 20$

$0.15M = 50$

$M = 333.33$

⑥ $100L = 120 \times C$

$C = \frac{100}{120} \times L$

Reduction = $\frac{20}{120} \times 100 = 16.67\%$

⑦ $\frac{125}{100} \times 100 = 125\%$

⑧ $1N \times 1.1 \times 1.1 \times 0.9 = 2025$

$N = \frac{2025}{0.99} \approx 2055$

⑨ $83 + 15 = 0.36M$

$M = \frac{100}{0.36} \approx 277.78$

Section - B

11Ans:- C.I ~~P~~ (perannually)

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

Given $\rightarrow P = 10000$

$$R = 10\%$$

$$n = 2 \text{ yrs.}$$

$$\begin{aligned}
 A &= 10000 \left(1 + \frac{10}{100}\right)^2 \\
 &= 10000 \left(\frac{110}{100}\right)^2 \\
 &= 10000 (1.10)^2 \\
 &= 12100 \\
 &= 12100 //
 \end{aligned}$$

$$\begin{aligned}
 CI &= 12100 - 10000 \\
 &= 2100 //
 \end{aligned}$$

1219 Ans:- $SI = \frac{P \times T \times R}{100}$

$$\begin{aligned}
 &= \frac{5000 \times 2 \times 10}{100} \\
 &= 1000 //
 \end{aligned}$$

$$\begin{aligned}
 A &= P \left(1 + \frac{R}{100}\right)^2 \\
 &= 5000 \left(1 + \frac{10}{100}\right)^2 \\
 &= 5000 \left(\frac{110}{100}\right)^2
 \end{aligned}$$

$$= 5000 \times 1.21 = 6050$$

$$C.I = 6050 - 5000 = 1050 //$$

$$Diff = 1050 - 1000 = 50 //$$

Ans: Given, $A = 4840$
 $P = 4000$
 $R = 10\%$
 $T = ?$

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

$$4840 = 4000 \left(1 + \frac{10}{100}\right)^T$$

$$\frac{4840}{4000} = \left(\frac{110}{100}\right)^T$$

$$4.21 = (1.10)^T$$

Comparing square on b.s,

$$(1.1)^2 = (1.10)^T$$

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

Ans: Given, $A = 12100$
 $P = 10000$
 $n = 2 \text{ yrs}$
 $R = ?$

$$\therefore A_{\text{amt}} = P \left(1 + \frac{R}{100}\right)^n$$

$$10000 = 12100 \left(1 + \frac{R}{100}\right)^2$$

$$\frac{10000}{12100} = \left(\frac{100+R}{100} \right)^2$$

$$10 \cdot 8264 = \frac{(100+R)^2}{10000}$$

$$8264 = \frac{(100+R)^2}{100}$$

$$10000 + 200R + R^2 = 826400$$

$$R^2 + 200R = 826400 - 10000$$

$$R^2 + 200R =$$

$$12100 = 10000 \left(\frac{100+R}{100} \right)^2$$

$$\frac{12100}{10000} = \left(\frac{100+R}{100} \right)^2$$

$$1.21 = \left(\frac{100+R}{100} \right)^2$$

Sq root on b.s

$$1.1 = \frac{100+R}{100}$$

$$\Rightarrow 110 = 100 + R$$

$$\Rightarrow R = 110 - 100 = 10\%$$

15Ans:- Given T = 4 yrs

Let Amount is double the principal

$$\Rightarrow A = 2P \quad R = ?$$

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

$$2P = P \left(1 + \frac{R}{100} \right)^4$$

$$2 = \left(1 + \frac{R}{100} \right)^4$$

quant root on both the side

$$\sqrt[4]{2} = \left(1 + \frac{R}{100} \right)$$

$$1.1892 = 1 + \frac{R}{100}$$

$$0.1892 = \frac{R}{100} \Rightarrow R = 18.92\%$$

$$1 + \frac{1}{2}$$

+ 0.5 '6Ans' - Given, sum double in 3 yrs at C.I

In C.I, 'If amount double in T years then'

It'll become 4 times in 2T yrs

It'll become 8 times in 3T yrs

∴ T_{to double} = 3 yrs.

So, time to be covered $8 \text{ times} = 8 \times 3 = 24$

1945: Given, $P_1 = 12,000$

$$R_1 = 8\%$$

$$R_2 = 10\%$$

$$P_2 = 8000$$

Assume time is same for both $T = 3$

\therefore Using S.I. Formula.

$$\begin{aligned} \text{S.I.}_1 &= \frac{12,000 \times 1 \times 8}{100} \\ &= 960 \text{ --- (1)} \end{aligned}$$

$$\begin{array}{r} 120 \\ 8 \\ \hline 960 \end{array}$$

$$\begin{aligned} \text{S.I.}_2 &= \frac{8000 \times 1 \times 10}{100} \\ &= 800 \text{ --- (2)} \end{aligned}$$

$$\therefore \text{Total S.I.} = 960 + 800 = ₹1760$$

$$\begin{aligned} \text{Total Principal} &= 12000 + 8000 \\ &= ₹20000 // \end{aligned}$$

$$\therefore \text{Avg Rate} = \frac{1760 \times 100}{20000}$$

$$= 8.8\% //$$

$$\left(\frac{\text{Total Interest}}{\text{Total Principal}} \times 100 \right)$$

18Ans: $Sum = Difference \times \left(\frac{100}{R}\right)^2$

$4000 = Difference \times \left(\frac{100}{10}\right)^2$

$4000 = Diff \times \frac{10000}{100}$

$\frac{4000 \times 100}{10000} = Diff$

$Diff = 40$

20Ans:

Given, $n = 2 \text{ yrs}$

$R = 5\%$

$A = 5512.50$

$P = ?$

(2) $+0+0$
2

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

$512.50 = P \left(1 + \frac{5}{100}\right)^2 - P$

$512.50 = P \left(\frac{105}{100}\right)^2 - P$

$512.50 = P((1.05)^2) - P$

$512.50 = P(1.1025 - 1)$

$512.50 = P(0.1025)$

$R = 5000$

$\frac{105}{105} = 2/5$

(3) $+0+0$

19Ans: Given, Total Investment = 216,000

$$R = 10\%$$

$$I \text{ on one part} = 3 \text{ yrs}$$

$$I \text{ on other part} = 5 \text{ yrs}$$

$$\text{Total Interest} = 26400$$

① ^{Let} Amount invested for 3 years = x
Let Amount invested for 5 yrs = $(16000 - x)$

② Interest from 3 yrs investment

$$I_1 = \frac{x \times 10 \times 3}{100} = 0.3x$$

Interest from 5 yrs invest.

$$I_2 = \frac{(16000 - x) \times 10 \times 5}{100}$$

$$= 0.5(16000 - x)$$

Total Interest

$$0.3x + 0.5(16000 - x) = 6400$$

$$0.3x + 8000 - 0.5x = 6400$$

$$- 0.2x + 8000 = 6400$$

$$- 0.2x = 6400 - 8000$$

$$- 0.2x = -1600$$

$$x = \frac{1600}{0.2} = 8000$$

∴ Amount invested for 5 years
 $= 16000 - 8000 = 8000 //$

Profit & Loss
Section C

21 Ans:- Shopkeeper problem

Given, loss = 40%

profit (if sold 100 more)
= 5%

Differ in S.p = 100

Let ~~cost~~ C.P = x

Formula: - Diff in S.P

$$= \frac{\text{Cost Price} \times (\text{profit} + \text{loss})}{100}$$

before deriving,

$$\text{S.P (for 10\% profit)} = \frac{90 \times \text{C.P}}{100}$$

$$\text{S.P (for 5\% profit)} = \frac{105 \times \text{C.P}}{100}$$

in order to derive, add profit & loss in this formula,

$$\text{Diff in S.P} = \frac{\text{C.P} \times (10 + 5)}{100}$$

$$100 = \frac{\text{C.P} \times 15}{100}$$

$$\Rightarrow \text{C.P} = \frac{10000}{15} = 666.66 \\ = ₹ 667$$

Ans: - Given, Let us assume cost price be ₹ 100,

* Marked price = 30% of C.P
 Successive discount = 10 each

$$10 + 10 = 20 \\ a = 10 \\ b = 10$$

So,

$$\text{Marked price} = \text{C.P.} + 30\% \text{ on C.P.}$$

$$= 100 + 30 = 130$$

So, Net Discat
(successive discat)

$$= a + b - \frac{a \times b}{100}$$

$$a = 10 \quad = 10 + 10 - \frac{10 \times 10}{100}$$

$$b = 10 \quad = 20 - 1 = 19\%$$

$$10 + 20$$

$$\frac{+ 10 \times 20}{100}$$

$$\text{So, S.P.} = \text{M.P.} - \text{Net discat}$$

$$= 130 - 19\% \text{ of } 130$$

$$= 130 - \frac{19}{100} \times 130 = 130 - 24.7$$

$$= \underline{\underline{105.3}}$$

$$30 + 1$$

$$32\%$$

$$\text{Since C.P.} = \text{₹} 100 \quad \text{S.P.} = \text{₹} 105.3$$

$$\text{Gain} = 105 - 100 = \text{₹} 5.3$$

$$120 - 32$$

$$\text{Gain \%} = \frac{5.3}{100} \times 100 = 5.3\%$$

$$88$$

$$120$$

$$100$$

23Ans: Given, Cost price of 10 articles = 28

$$\text{C.P of article} = \frac{28}{10} = 2.8$$

$$\text{S.P of article} = ₹ 1.20$$

$$\therefore \text{profit} = \text{S.P} - \text{C.P} = 1.20 - 0.8 = 0.4$$

$$\text{profit \%} = \frac{0.4}{0.8} \times 100 = 50\%$$

24Ans: Given, Discount = 20%
Profit = 25%

$$\text{Mark up \%} = \left(\frac{100 + \text{profit \%}}{100 - \text{Discount \%}} \right) \times 100 - 100$$

$$= \left(\left(\frac{100 + 25}{100 - 25} \right) \times 100 \right) - 100$$

$$= (156.25) - 100 = 56.25\%$$

$$10 + 20 + \frac{10 \times 20}{100} \\ 30 + \frac{200}{100} = 32$$

25 Ans: Given,

A makes profit of 10%

B makes profit of 20%

Final S.p of C = ₹132

S.p of A = ?

132 Since Profit of A increases till
20 B increases, apply successive
152 change for resultant profit per
100
162

$$\text{Result Perct} = +x + y + \frac{xy}{100}$$

$$= 10 + 20 + \frac{10 \times 20}{100}$$

$$= 30 + \frac{200}{100} = 32\%$$

$$\therefore \text{S.p of A} = \text{Final S.p of C} - \text{Net perct}$$

$$= 132 - 32 = ₹100$$

26 Ans: - Given MarkUp Price is increased by 20%

Discount is increased from 10 to 20%
net effect on (S.P.) = ?

① Initial S.P.:

Assume initial M.P. = ₹100

$$\therefore \text{Initial S.P.} = 100 - 10 = ₹90 //$$

② New S.P.:

New marked price after 20%

$$= 100 + 20\% = 120 //$$

$$\therefore \text{New S.P.} = 120 - \frac{20}{100} \times 120$$
$$= 96 //$$

$\begin{array}{r} 110 \\ 120 \\ 20 \\ \hline 90 \end{array}$

③ Diff in = $96 - 90 = ₹6$ increase

④ Percentage change = $\frac{6}{90} \times 100 = 6.67\%$
increase

$$\frac{900}{100}$$

$$\left(\frac{10}{100}\right)^2 = \frac{1}{100}$$

27Ans: overall weight (loss%)

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

$$\frac{90}{100}$$

$$= \left(\frac{10}{100}\right)^2 = \frac{1}{100}$$

$$= 1\%$$

28Ans: Given, false weight

$$\frac{900}{1000}$$

$$= 900g$$

$$= \frac{900}{1000} = 0.9$$

900x C.p of 900g false w = $\frac{900 \times 100}{1000}$

$$= 90 //$$

$$\frac{900 \times 100}{1000}$$

1000 S.p = 100

$$\frac{90 \times 100}{1000}$$

0.9 Gain = $100 - 90 = 10 //$

0.9 x 100 Gain% = $\frac{10 \times 100}{90} = 11.1\%$

$$\frac{0.9 \times 100}{100}$$

$$\frac{0.1}{100}$$

Error = 900g

$$\frac{0.9 + 1 \times 100}{100}$$

$$\frac{100 - 0.9}{100}$$

$$\frac{900}{1000} = 0.9$$

$$= 0.9 \times 100 = 90$$

~~Q. 10~~

$$\text{True weight} = 1000 - 900 = 100$$

$$\text{So, Gain \%} = \frac{10}{90} \times 100 = 11.1\%$$

$$\text{Gain \%} = \frac{\text{Error}}{\text{True weight}} \times 100$$

$$\text{Error} = 100g$$

$$\text{actual Error} = 1000 - 900 = 100g$$

$$\text{True weight} = 900g$$

$$\text{Gain \%} = \frac{100}{900} \times 100 = 11.1\%$$

29 Ans: Given, Discount = 5%
 Gain = 20%
 C.P (C.P) = ₹ 100

$$\text{Gain} = \text{S.p} - \text{C.P}$$

$$\Rightarrow \text{S.P} \Rightarrow \text{Gain} + \text{C.P}$$

$$= 100 + 20 = ₹ 120$$

$$\text{S.p} = \text{M.p} - \text{Discount} \Rightarrow 120 = \text{M.p}$$

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

$$\frac{5}{100} \times 120 = 6$$

$$\begin{aligned}\text{Here Discount} &= 100 - \text{Dis \%} \\ &= 100 - 5 = 95\%\end{aligned}$$

$$\therefore 120 = \text{M.p.} \times \left(\frac{5 \times \text{MP}}{100} \right) \times 100\%$$

$$120 = \text{M.p.} \times 0.95$$

$$\text{M.p.} = \frac{120}{0.95} = 126.32 //$$

So

(Ans)

$$\text{M.p.} = \frac{100 + \text{Gain \%}}{100 - \text{Discount \%}} \times \text{C.P.}$$

$$= \frac{120}{95} \times 100 = 126.32 //$$