SOLUTIONS

1. (a)

$$\text{Principal} = \left(\frac{10}{11}\right)^5 \times 161051$$

$$= \frac{100000}{161051} \times 161051 = 100000$$

Amount after 3 years

$$= \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \times 100000$$

= Rs.133100

2. (d)

I year → 1
II year → 1 1
III year → 1 2 1
IV year → 1 3 3 1
V year → 1 4 6 4 1
↓ ↓ ↓ ↓ ↓
5 10 10 5 1

$$100000 \times \frac{7}{100} = 7000$$

$$7000 \times \frac{7}{100} = 490$$

$$490 \times \frac{7}{100} = 34.3$$

$$34.3 \times \frac{7}{100} = 2.401$$

$$2.401 \times \frac{7}{100} = 0.16807$$

CI = 5 × 7000 + 10 × 490 + 10 × 34.3 + 5 × 2.401 + 1 × 0.16807

= 35000 + 4900 + 343 + 12.005 + 0.16807

= Rs.40,255.1731 ~ Rs.40,255

Alternate Method:

Amount after I[st] year = 100000 × $\frac{107}{100}$ = 107000

Amount after II[nd] year = 107000 × $\frac{107}{100}$ = 114490

Amount after III[rd] year = 114490 × $\frac{107}{100}$ = 122504.3

Amount after IV[th] year = 122504.3 × $\frac{107}{100}$ = 131079.6

Amount after V[th] year = 131079.6 × $\frac{107}{100}$ = 140255.17

CI = 140255.17 – 100000

= 40255.17 ~ Rs.40255

3 (a)

P = 25000

R = 12%, t = 3 yrs.

I year → 1
II year → 1 1
III year → 1 2 1
↓ ↓ ↓
3 3 1

C.I = (3 × 12 × 250) + (3 × 12 × 30) + (12 × 3.6)

= 9000 + 1080 + 43.2

= Rs.10123.20

Alternate Method:

$$\frac{\text{1st year}}{12\%} \longrightarrow \frac{\text{3rd year}}{40.4928\%}$$

$$\text{C.I} = \frac{25000 \times 40.4928}{100}$$

$$= \frac{10,12,320}{100} = \text{Rs. } 10,123.20$$

4. (d)

$$R = \frac{10}{2}\% = 5\% = \frac{1}{2} \overset{+}{\leftarrow} \frac{21}{20}$$

t = 3 half years.

Amount = 64,827

P	A
20	21
20	21
20	21
8000	9261
↓×7	↓×7
56000	64872

Alternate Method:

$$R = \frac{10}{2}\% = 5\% = \frac{1}{2} \overset{+}{\leftarrow} \frac{21}{20}$$

t = 3 half years.

Amount = 64,827

$$\text{Principal} = \frac{20}{21} \times \frac{20}{21} \times \frac{20}{21} \times 64827$$

$$= \frac{8000}{9261} \times 64827$$

= 8000 × 7 = Rs.56000

5. (b)

Peter	Rachel
Sum = P	Sum = $\frac{P}{2}$
R = 10%	R = 10%
S.I	C.I
t = 2yrs.	t = 3yrs

ATQ,

$$I = \frac{20}{100} \times P \qquad I = \frac{33.1}{100} \times \frac{P}{2}$$

$$\text{Then, Difference} = \frac{20P}{100} - \frac{33.1P}{200} = 897$$

$$\Rightarrow 40P - 33.1P = 897 \times 200$$

$$\Rightarrow 6.9\,P = 897 \times 200$$

$$\Rightarrow P = 26000$$

$$\therefore \text{Sum with Rachel} = \frac{P}{2} = \text{Rs.}13000$$

6. (c)

We know,

Differnce in 1 year = 1260 – 1200 = Rs. 60

Rs.60 is intrest on 1200

$$\therefore R = \frac{60}{1200} \times 100 = 5\%$$

7. (b)

P = 8000, R = 10%

t = 2 half yrs

$$\therefore CI = \frac{21}{100} \times 8000$$

= Rs. 1680

8. (a)

P = 6500 R = 5%

t = 4 half years

$$\text{Amount} = 6500\left[1 + \frac{5}{100}\right]^4$$

$$= 6500 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$$

= Rs.7900

9. (b)
Difference between SI and CI for 3 yrs (d)

$$= P\left(\frac{r}{100}\right)^2\left(3+\frac{r}{100}\right)$$

$$= 6500\left(\frac{7}{100}\right)^2\left(3+\frac{7}{100}\right)$$

$$= 6500 \times \frac{49}{100} \times \frac{307}{100} = 97.78$$

SMART APPROACH:-
Effective Rate for SI for 3 year
$= 3R\% = 3 \times 7\% = 21\%$
Effective Rate for CI for 3 year
$= 3R.3R^2 | R^3$
$= 21.147 | 343$
$= 22.5043$
Difference Rate%
$= (22.5043 - 21)\% = 1.5043\%$
Difference $= 6500 \times 1.5043\%$
$= 97.7795 = Rs.97.78(Appx)$

10. (a)
Given,
P = 50000
T = 3 year
R = 10%
I = 15000

We know that, $10\% = \frac{1}{10}$

The amount he owes at the end of 1st year

$$= 50000 \times \frac{11}{10} - 15000$$

$= 55000 - 15000 = Rs.\ 40000$

The amont he owes at the end of 2nd year–

$$= 40000 \times \frac{11}{10} - 15000$$

$= 44000 - 15000 = Rs.\ 29000$

The amount he owes at the end of 3rd year–

$$= 29000 \times \frac{11}{10} - 15000$$

$= 31900 - 15000 = Rs.16900$

11. (a)

$$\text{Rate} = \frac{8}{2} = 4\%$$

$$\text{Time} = 18 \times \frac{1}{6} = 3$$

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

$$\text{Amount} = 7500 \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25}$$

$= 8436.48$

12. (a)

$$D = P\left(\frac{r}{100}\right)^2\left(3+\frac{r}{100}\right)$$

$$= 15625\left(\frac{4}{100}\right)^2\left(3+\frac{4}{100}\right)$$

$$= 15625 \times \frac{16}{10000} \times \frac{304}{100} = Rs.76$$

13. (d)
Simple Interest for 1 year = 16%

$$\text{Rate for CI} = \left(8+8+\frac{8\times 8}{100}\right)\%$$

$= 16.64\%$
Difference $= (16.64 - 16)\% = 0.64\%$
$\because 0.64\% = 60$

$$\therefore 100\% = \frac{60}{0.64} \times 100 = ₹\ 9375$$

Hence, The lent sum = ₹9375

14. (d)
A = 7436
t = 2 year
r = 4%

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

$$\Rightarrow 7436 = P\left(1+\frac{4}{100}\right)^2$$

$$\Rightarrow 7436 = P\left(\frac{26}{25}\right)^2$$

$$\Rightarrow 7436 = \frac{676P}{625}$$

$$\Rightarrow P = \frac{7436 \times 625}{676}$$

$\Rightarrow P = 6875$

SMART APPROACH:-

We know, $4\% = \frac{1}{25}$

$$\text{Principle} = 7436 \times \left(\frac{25}{26}\right)^2$$

$= Rs.6875$

15. (b)
Difference = 8469.44 – 7562
= 907.44

$$\text{Rate\%} = \frac{907.44}{7562} \times 100\% = 12\%$$

16. (a)
Difference = 8469.44 – 7562
= 907.44

$$\text{Rate\%} = \frac{907.44}{7562} \times 100\% = 12\%$$

Now,
P = 10000, R = 12%, T = 2 years

$$= 10{,}000\left[\left(1+\frac{12}{100}\right)^2 - 1\right]$$

$$= 10{,}000 \times \frac{212}{100} \times \frac{12}{100} = 2544$$

17. (c)

$$\text{Difference} = \frac{17^2}{100} = 2.89\%$$

$$\text{Sum, } 100\% = \frac{433.5}{2.89} \times 100$$

$= Rs.15000$

18. (c)

$$\text{Difference} = \frac{17^2}{100} = 2.89\%$$

$$\text{Sum, } 100\% = \frac{433.5}{2.89} \times 100$$

$= Rs.15000$

$$\text{Net CI} = 17+17+\frac{17\times 17}{100} = 36.89\%$$

CI = 15000 × 36.89% = Rs. 5533.50

19. (b)
SI for 2 year = 20%
CI for 2 year = 21%

$$CI = \frac{8100}{20} \times 21 = 8505$$

20. (a)
P = ?

$$8100 = \frac{P \times 10 \times 2}{100}$$

P = 40500
CI of 2 years at the Rate 15%

$$I = 40500 \times \frac{15}{100} = 6075$$

II = 6075 + 911.25
Total CI = 6075 × 2 + 911.25
= 12150 + 911.25
= 13061.25
≅ 13061

SMART APPROACH:-
SI for 2 year at 10% = 20%
CI for 2 year at 15% = 32.25%

$$CI = \frac{8100}{20} \times 32.25 = Rs.13061.25$$

21. (a)

$$\text{In one year} = \sqrt{\frac{44100}{40000}} = \frac{21}{20} \ldots (1)$$

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

22. (b)

3 yrs: P → 35680; 3 yrs: 35680 → 53520

$$P = 35680 \times \frac{35680}{53520} = Rs.\ 23786$$

C.I for 3 yrs. = 35680 – 23786
$= Rs.\ 11894$

23. (b)

New rate = 8%, cycle = $\frac{16m}{8m} = 2$

Net CI = $8 + 8 + \frac{8 \times 8}{100} = 16.64\%$

CI = $37500 \times 16.64\% = 6240$

24. (c)

CI for 3 years = 3630

CI for 2 years = 3300

Rate = $\frac{(3630 - 3300)}{3300} \times 100\%$

$= \frac{330}{3300} \times 100\% = 10\%$

CI for first year = $\frac{3300}{110} \times 100$

= Rs. 3000

Principal = $\frac{3000}{10\%} \times 100\% = 30{,}000$

P = 30,000, R = 10%, T = $2\frac{1}{2}$ year

Interest compounded yearly

10% at 2 year successive = 21%

Now, $21 + 5 + \frac{21 \times 5}{100} = 27.05$

CI = $30{,}000 \times \frac{27.05}{100} = 8115$

Amount = 30000 + 8115 = Rs.38115

25. (d)

P = 5000, A = 7200, t = 8 years

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

$\Rightarrow 7200 = 5000\left(1 + \frac{r}{100}\right)^8$

$\Rightarrow \frac{7200}{5000} = \left(1 + \frac{r}{100}\right)^8$

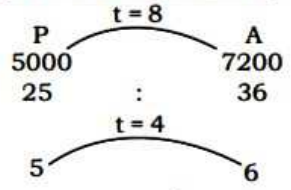
$\Rightarrow \frac{\sqrt{36}}{\sqrt{25}} = \left(1 + \frac{r}{100}\right)^4$

$\Rightarrow \left(1 + \frac{r}{100}\right)^4 = \frac{6}{5}$

CI on a sum of Rs 6550 in 4 year

at same rate = $6550 \times \frac{1}{5}$ = Rs.1310

SMART APPROACH:-



CI = $6500 \times \frac{1}{5}$ = Rs.1310

26. (a)

Using Sucessive Method,

Net CI for 2 Years at 10% = 21%

Sum = $\frac{1522.5}{21\%} \times 100\%$ = Rs. 7250

27. (d)

Amount = 12777.6

Interest compounded eight monthly

New rate = 10%

Time = 3 cycle

Net CI for 3 cycle at 10% = 33.1%

Sum = $\frac{12777.6}{133.1} \times 100\%$ = Rs 9600