CHAPTER 4

Simple And Compound Interest, Installments

4.1

If P stands for principal, R the rate percent per annum, T the number of years, A the amount and SI the simple interest, then

(i) $\mathbf{SI = \frac{PRT}{100}}$ **(ii)** $\mathbf{R = \frac{SI \times 100}{P \times T}}$ **(iii)** $\mathbf{T = \frac{SI \times 100}{P \times R}}$

(iv) $\mathbf{P = \frac{SI \times 100}{R \times T}}$ **(v)** $\mathbf{SI = \frac{ART}{100 + RT}}$ **(vi)** $\mathbf{P = \frac{100.A}{100 + RT}}$

NUMERICAL CHALLENGE 4.1

1. Find the simple interest and amount on Rs. 1000 at 12% per annum for 5 years.

Solution

$$SI = \frac{PRT}{100} = \frac{1000 \times 12 \times 5}{100} = \text{Rs. } 600$$

Final amount = P + SI = 1000 + 600 = Rs. 1600

2. Find the simple interest on Rs. 800 at 7% per annum is Rs. 700 at 16% p.a. and on Rs. 500 at 4% p.a. for 2 years.

Solution

$$SI = \frac{P_1\ R_1\ T_1}{100} + \frac{P_2\ R_2\ T_1}{100} + \frac{P_3\ R_3\ T_1}{100}$$

$$= \frac{800 \times 7 \times 2}{100} + \frac{700 \times 16 \times 2}{100} + \frac{500 \times 4 \times 2}{100}$$

= 112 + 224 + 40

= Rs. 376

3. If Rs. 650 amounts to Rs.790 in 4 years, then what sum of money will it amount to in 7 years at the same rate of interest?

Solution

SI = Rs. (790 – 650) = Rs 140. Also, S.I. $= \frac{PRT}{100}$

$$\Rightarrow \quad 140 = \frac{650 \times (R) \times (4)}{100} \Rightarrow R = \frac{140 \times 100}{650 \times 4} = \frac{70}{13}$$

$$\text{Amount} = P\left[1 + \frac{RT}{100}\right] = 650\left[1 + \frac{70 \times 7}{13 \times 100}\right]$$

$$= 650\left[1 + \frac{490}{1300}\right] = \text{Rs. } 895.$$

4.2

If a principal P becomes 'n' times of itself in T years at R% rate per-annum,

then RT = (n – 1) × 100

NUMERICAL CHALLENGE 4.2

1. A certain sum of money triples itself in 5 years simple interest. Find the rate percent annum.

Solution

Here n = 3, T = 5 years

$$\therefore R = \frac{100(n-1)}{T}\% = \frac{100(3-1)}{5} = 40\%$$

2. In what time a sum of money will double itself at a rate of simple interest of 8% per annum?

Solution

$$\text{Required time (T)} = \frac{(n-1)\times 100}{R} \text{ years}$$

$$= \frac{(2-1)\times 100}{8} \text{ years}$$

$$= 12\frac{1}{2} \text{ years.}$$

4.3

If a certain sum of money becomes n times itself in T year at a simple interest, then the time T in which it will becomes m times itself is given by

$$\mathbf{T' = \left(\frac{m-1}{n-1}\right) \times T \text{ years.}}$$

NUMERICAL CHALLENGE 4.3

A sum of money put out on simple interest doubles itself in $12\frac{1}{2}$ years. In how many years would it treble itself?

Solution

Here n = 2, m = 3, $T = \frac{25}{2}$ years.

$$\therefore \text{Required time (T')} = \left(\frac{m-1}{n-1}\right) \times T \text{ years}$$

$$= \left(\frac{3-1}{2-1}\right) \times \frac{25}{2} \text{ years}$$

$$= 25 \text{ years.}$$

4.4

(i) Effect of change of P, R and T on simple interest is given by the following formula:

Change in simple Interest :

$$= \frac{\text{Product of fixed parameter}}{100} \times \text{[difference of product of variable parameters]}$$

For example, if rate (R) changes from R_1 to R_2 and P, T are fixed, then

$$\text{Change in SI} = \frac{PT}{100} \times (R_1 - R_2)$$

(ii) Similarly, if principal (P) changes from P_1 to P_2 and R, T are fixed,

$$\text{then changes in SI} = \frac{RT}{100} \times (P_1 - P_2)$$

(iii) Aslo, if rate (R) changes from R_1 to R_2 and time (T) changes from T_1 to T_2 but pricipal (P) is fixed, then change in

$$\text{SI} = \frac{P}{100} \times (R_1T_1 - R_2T_2).$$

NUMERICAL CHALLENGE 4.4

1. If simple interest on Rs.600 increases by Rs. 30 When the rate % increases by 4% per annum, find the time.

Solution

Here P = 600, change in SI = 30, $R_1 - R_2 = 4$, T = ?

Using, change in SI = $\frac{PT}{100} \times (R_1 - R_2)$

we have, $30 = \frac{600T}{100} \times 4 \Rightarrow T = \frac{5}{4}$, i.e., $1\frac{1}{4}$ years.

2. If the simple interest on Rs. 1400 be more than the interest on Rs. 1000 by Rs. 60 in 5 years, find the rate percent per annum.

Solution

Here change in SI = 60, $P_1 - P_2 = 400$, T = 5, R = ?

Using change in SI = $\frac{RT}{100} \times (P_1 - P_2)$

We have $60 = \frac{5R}{100} \times 400 \Rightarrow R = 3\%$.

3. If the simple interest on a certain sum at 4% per annum for 4 years is Rs. 80 more than the interest on the same sum for 3 years at 5% per annum, find the sum.

Solution

Here change in SI = 80, $R_1 = 4$, $R_2 = 5$, $T_1 = 4$, $T_2 = 3$, P = ?

Using change in SI = $\frac{P}{100} \times (R_1T_1 - R_2T_2)$

We have $80 = \frac{P}{100} \times (4 \times 4 - 5 \times 3)$

4.5

If a certain sum of money P lent out at SI amounts to A_1 in T_1 years and to A_2 in T_2 years, then

$$\mathbf{P = \frac{A_1T_2 - A_2T_1}{T_2 - T_1}}$$

and

$$\mathbf{R = \frac{A_1 - A_2}{A_1T_2 - A_2T_1} \times 100\%}$$

NUMERICAL CHALLENGE 4.5

If a certain sum of money at simple interest amounts to Rs 5184 in 2 years and to Rs. 5832 in 3 years, what is the sum and the rate of interest?

Solution

$$\text{Principal} = \frac{A_1T_2 - A_2T_1}{T_2 - T_1}$$

$$\left[\begin{matrix}\text{Here } A_1 = 5184, A_2 = 5832 \\ T_1 = 2, T_2 = 3\end{matrix}\right]$$

$$= \frac{5184 \times 3 - 5832 \times 2}{3 - 2} = \text{Rs. } 3888$$

$$\text{and} \quad \text{Rate} = \frac{(A_2 - A_1) \times 100}{T_1A_2 - T_2A_1} = \frac{(5832 - 5184) \times 100}{2 \times 5832 - 3 \times 5184}$$

$$= \frac{64800}{3888} = 16\frac{2}{3}\%.$$

4.6

If a certain sum of money P lent out for a certain time T amounts to A_1 at R_1% per annum and to A_2 at R_2% per annum, then

$$\mathbf{P = \frac{A_2R_1 - A_1R_2}{R_1 - R_2}}$$

and

$$\mathbf{T = \frac{A_1 - A_2}{A_2R_1 - A_1R_2} \times 100 \text{ years}}$$

NUMERICAL CHALLENGE 4.6

A certain sum is invested for certain time. It amounts to Rs. 450 at 7% per annum. But when invested at 5% per annum, it amounts to Rs. 350. Find the sum and time.

Solution

Here $A_1 = 450$, $R_1 = 7$, $A_2 = 350$, $R_2 = 5$.

Using the formula,

$$P = \frac{A_2R_1 - A_1R_2}{R_1 - R_2}$$

$$\text{We get, } P = \frac{350 \times 7 - 450 \times 5}{7 - 5} = \text{Rs.}100$$

Also, using the formula,

$$T = \left(\frac{A_1 - A_2}{A_2R_1 - A_1R_2}\right) \times 100$$

$$\text{we get, } T = \left(\frac{450 - 350}{350 \times 7 - 450 \times 5}\right) \times 100 = 5 \text{ years.}$$

4.7

If an amount P_1 lent at simple interest rate of R_1% per annum and another amount P_2 at simple interest rate of R_2% per annum, then the rate of interest for the whole sum is

$$\mathbf{R = \left(\frac{P_1R_1 + P_2R_2}{P_1 + P_2}\right).}$$

NUMERICAL CHALLENGE 4.7

Mohan deposits Rs.5000 in NSC at 2% per annum and Rs. 2000 in mutual funds at 4% per annum. Find the rate of interest for the whole sum.

Solution

Here $P_1 = 5000$, $R_1 = 2$, $P_2 = 2000$, $R_2 = 4$.

Using the formula

$$R = \left(\frac{P_1R_1 + P_2R_2}{P_1 + P_2}\right)$$

We get $$R = \frac{5000 \times 2 + 2000 \times 4}{5000 + 2000} = 2\frac{4}{7}\%.$$

4.8

If a certain sum of money is lent out in n parts in such a manner that equal sum of money is obtained as simple interest on each part where interest rates are $R_1, R_2, \ldots, R_n$, respectively and time periods are $T_1, T_2, \ldots, T_n$, respectively, then the ratio in which the sum will be divided in n parts is given by

$$\mathbf{\frac{1}{R_1T_1} : \frac{1}{R_2T_2} : \ldots \frac{1}{R_nT_n}.}$$

NUMERICAL CHALLENGE 4.8

1. If a sum of Rs. 1600 is divided into two such parts that the simple interest on the first part for two and half years at the rate of 4% p.a. equals the simple interest on the second part for 5 years at the rate of 3% p.a., then find two such divisions of the sum.

Solution

Ratio of one part to other part of Rs. 1600

$$= \frac{1}{R_1T_1} : \frac{1}{R_2T_2}$$

$\therefore$ 1^{st} part : 2^{nd} part $= \frac{1}{4 \times 5/2} : \frac{1}{3 \times 5}$

[Here $R_1 = 4\%$ p.a., $T_1 = 5/2$ years, $R_2 = 3\%$ p.a., $T_2 = 5$ years]

or, 1^{st} part : 2^{nd} part $= \frac{1}{10} : \frac{1}{15} = 3 : 2$

Sum of proportionals = 3 + 2 = 5

$\therefore$ 1^{st} part $= \frac{3}{5} \times 1600 =$ Rs. 96

and 2^{nd} part $= \frac{2}{5} \times 1600 =$ Rs. 640.

2. If Rs.85 amounts to Rs. 95 in 3 years, what Rs. 102 will amount to in 5 years at the same rate per cent?

Solution

Here P_1 = Rs.85, A_1 = Rs.95, T_1 = 3 years, P_2 = Rs. 102, T_2 = 5 yrs, $R_1 = R_2 = R$ (say)

Then, using the formula

$$\frac{A_1 - P_1}{A_2 - P_2} = \frac{P_1 \times R_1 \times T_1}{P_2 \times R_2 \times T_2}$$

We have $$\frac{95 - 85}{A_2 - 102} = \frac{85 \times R \times 3}{102 \times R \times 5}$$

$\Rightarrow$ $A_2 - 102 = 20$

$\Rightarrow$ $A_2 = 122$

$\therefore$ The amount is Rs. 122.

3. Out of a certain sum, one-third is invested at 3%, one-sixth at 6% and the rest at 8%. If the annual income is Rs. 300, then the original sum is

Solution

Here $\frac{1}{a} = \frac{1}{3}$, $\frac{1}{b} = \frac{1}{6}$,

$$\frac{1}{c} = 1 - \left(\frac{1}{3} + \frac{1}{6}\right) = \frac{1}{2},$$

$\therefore$ The original sum $= \dfrac{A \times 100}{\frac{R_1}{a} + \frac{R_2}{b} + \frac{R_3}{c}}$

$$= \frac{300 \times 100}{\frac{3}{3} + \frac{6}{6} + \frac{8}{2}} = \frac{30000}{6}$$

= Rs. 5000.

4.9

(i) The amount A due after t years, when a principal P is given on compound interest at the rate R% per annum is given by

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

(ii) Compound interest, CI = A – P

$$\mathbf{= P\left[\left(1 + \frac{R}{100}\right)^t - 1\right]}$$

(iii) Rate of interest, $\mathbf{R = \left[\left(\frac{A}{P}\right)^{1/t} - 1\right]}$ **% p.a.**

Note : Simple interest and compound interest for 1 year at a given rate of interest per annum are always equal.

NUMERICAL CHALLENGE 4.9

1. Mohan invested an amount of Rs. 15000 at compound interest rate 5% per annum for a period of 2 years. What amount will he receive at the end of 2 years?

Solution

Here P = 15000, R = 5 and t = 2.

$$\therefore \quad \text{Amount} = P\left(1+\frac{R}{100}\right)^t$$

$$= 15000\left(1+\frac{5}{100}\right)^2 = 15000\left(1+\frac{1}{20}\right)^2$$

$$= \frac{15000\times 21\times 21}{20\times 20} = \text{Rs. } 16537.50.$$

2. Find compound interest on Rs. 5000 for 2 years at 4% per annum.

Solution

Here P = 5000, R = 4 and t = 2.

$$\therefore \quad CI = P\left[\left(1+\frac{R}{100}\right)^t - 1\right]$$

$$= 5000\left[\left(1+\frac{4}{100}\right)^2 - 1\right]$$

$$= 5000\left[\left(\frac{26}{25}\right)^2 - 1\right] = 5000((1.04)^2 - 1)$$

$$= 5000(1.0816 - 1) = \text{Rs. } 408.$$

$\therefore$ The compound interest is Rs. 408.

3. Rashi invested Rs. 16000 for two years at coumpound interest and received an amount of Rs. 17640 on maturity. What is the rate of interest ?

Solution

Here P = 16000, t = 2 and A = 17640.

$$\therefore \quad R = 100\left[\left(\frac{A}{P}\right)^{1/t} - 1\right]\% \text{ p.a.}$$

$$= 100\left[\left(\frac{17640}{16000}\right)^{1/2} - 1\right]\% \text{ p.a.}$$

$$= 100\left[\left(\frac{441}{400}\right)^{1/2} - 1\right]\% \text{ p.a.}$$

$$= 100\left[\left(\frac{21}{20}\right)^{2\times\frac{1}{2}} - 1\right]\% \text{ p.a.}$$

$$= 100 \times \frac{1}{20} = 5\% \text{ p.a.}$$

4.10

If the interest is compounded half-yearly, then

(i) **Amount, $A = P\left(1+\frac{R}{100\times 2}\right)^{2t}$.**

(ii) **Compound interest, CI**

$$= P\left[\left(1+\frac{R}{100\times 2}\right)^{2t}-1\right]$$

(iii) **Rate, $R = 2 \times 100\left[\left(\frac{A}{P}\right)^{\frac{1}{t}\times 2}-1\right]$ % p.a.**

NUMERICAL CHALLENGE 4.10

Find the amount of Rs. 8000 in one and half years at 5% per annum compound interest payable half-yearly.

Solution

Here P = 8000, R = 5 and t = 3/2.

$$\therefore \quad \text{Amount} = P\left(1+\frac{R}{100\times 2}\right)^{2t}$$

$$= 8000\left(1+\frac{5}{100\times 2}\right)^{2\times\frac{3}{2}} = 8000\left(\frac{41}{40}\right)^{3}$$

$$= \frac{8000\times 41\times 41\times 41}{40\times 40\times 40} = \text{Rs. } 8615.13.$$

4.11

If the interest is compounded quarterly, then

(i) **Amount, $A = P\left(1+\frac{P}{100\times 4}\right)^{4t}$**

(ii) **Compound interest, CI**

$$= P\left[\left(1+\frac{R}{100\times 4}\right)^{4t}-1\right]$$

(iii) **Rate, $R = 4 \times 100\left[\left(\frac{A}{P}\right)^{\frac{1}{t}\times 4}-1\right]$ % p.a.**

In general, if the interest is compounded n times a year, then

(a) Amount, $A = P\left(1+\frac{R}{100\times n}\right)^{n\times t}$

(b) Compound interest, $CI = P\left[\left(1+\frac{R}{100\times n}\right)^{n\times t}-1\right]$

(c) Rate of interest, $R = n \times 100\left[\left(\frac{A}{P}\right)^{\frac{1}{t}\times n}-1\right]$ % p.a.

NUMERICAL CHALLENGE 4.11

1. Find the compound interest on Rs. 1000 at 40% per annum compounded quartely for 1 year.

Solution

Here P = 1000, R = 40 and t = 1.

$\therefore$ Compound interest (CI)

$$= P\left[\left(1+\frac{R}{100\times 4}\right)^{4\times t}-1\right]$$

$$= 1000\left[\left(1+\frac{40}{100\times 4}\right)^{4\times 1}-1\right] = 1000\left[\left(\frac{11}{10}\right)^{4}-1\right]$$

$$= 1000\left[\frac{14641-10000}{10000}\right] = \text{Rs. } 464.10.$$

2. Find the compound interest on Rs. 4000 at 24% per annum for 3 months, compounded monthly.

Solution

Here P = 4000, R = 24 and t = $\frac{3}{12}$.

$$\therefore \text{CI} = P\left[\left(1+\frac{R}{100\times 12}\right)^{12\times t}-1\right]$$

$$= 4000\left[\left(1+\frac{24}{100\times 12}\right)^{12\times\frac{3}{12}}-1\right]$$

$$= 4000\left[\left(\frac{51}{50}\right)^{3}-1\right] = \frac{4000\times 7651}{50\times 50\times 50}$$

= Rs. 244.83

4.12

When the rates of interest are different for different years, say R_1 , R_2, R_3 per cent for first, second and third year, respectively, then

$$\textbf{Amount} = P\left(1+\frac{R_1}{100}\right)\left(1+\frac{R_2}{100}\right)\left(1+\frac{R_3}{100}\right)$$

NUMERICAL CHALLENGE 4.12

Anu invests Rs. 5000 in a bond which gives interest at 4% per annum during the first year, 5% during the second year and 10% during third year. How much does she get at the end of the third year.

Solution

Here P = 5000, R_1 = 4, R_2 = 5 and R_3 = 10.

$\therefore$ Amount at the end of third year

$$= P\left(1+\frac{R_1}{100}\right)\left(1+\frac{R_2}{100}\right)\left(1+\frac{R_3}{100}\right)$$

$$= 5000\left(1+\frac{4}{100}\right)\left(1+\frac{5}{100}\right)\left(1+\frac{10}{100}\right)$$

$$= 5000 \times \frac{26}{25}\times\frac{21}{20}\times\frac{11}{10} = \text{Rs. } 6006.$$

4.13

When the time is given in the form of fraction, say $\frac{3}{4}$ years, then

$$\textbf{Amount} = \mathbf{P}\left(1+\frac{\mathbf{R}}{\mathbf{100}}\right)^{3} \times \left(1+\frac{\frac{\mathbf{3}}{\mathbf{4}}\mathbf{R}}{\mathbf{100}}\right).$$

NUMERICAL CHALLENGE 4.13

What will be the compouned interest on Rs.15625 for two and half years at 4% per annum?

Solution

$$\text{CI} = 15625\left[\left(1+\frac{4}{100}\right)^{2}\left(1+\frac{4\times\frac{1}{2}}{100}\right)-1\right]$$

$$= 15625\left[\frac{26}{25}\times\frac{26}{25}\times\frac{51}{50}-1\right]$$

$$= \frac{15625\times 3226}{31250} = \text{Rs. } 1613.$$

4.14

(i) The difference between the compound interest and the simple interest on a certain sum of money for 2 years at R% per annum is given by

$$\textbf{CI} - \textbf{SI} = \mathbf{P}\left(\frac{\mathbf{R}}{\mathbf{100}}\right)^{2} \quad \textbf{[in terms of P and R]}$$

and $$\textbf{CI} - \textbf{SI} = \frac{\mathbf{R}\times\mathbf{SI}}{\mathbf{2}\times\mathbf{100}} \quad \textbf{[in terms of SI and R]}$$

(ii) The difference between the compound interest and the simple interest on a certain sum of money for 2 years at R% per annum is given by

$$\textbf{CI} - \textbf{SI} = \mathbf{P}\left[\left(\frac{\mathbf{R}}{\mathbf{100}}\right)^{3}+\left(\frac{\mathbf{R}}{\mathbf{100}}\right)^{2}\right] \quad \textbf{[in terms of P and R]}$$

and, $$\textbf{CI} - \textbf{SI} = \frac{\mathbf{SI}}{\mathbf{3}}\left[\left(\frac{\mathbf{R}}{\mathbf{100}}\right)^{2}+3\left(\frac{\mathbf{R}}{\mathbf{100}}\right)\right] \quad \textbf{[in terms of SI and R]}$$

NUMERICAL CHALLENGE 4.14

1. What will be the difference between simple and compound interest on a sum of Rs.4500 put for 2 years at 5% per annum?

Solution

Here P = 4500 and R = 5.

$$\therefore \text{CI} - \text{SI} = P\left(\frac{R}{100}\right)^2 = 4500\left(\frac{5}{100}\right)^2 = \frac{4500}{20\times 20} = \text{Rs. } 11 \times 25.$$

2. If the difference between the compound interest and simple interest on a certain sum of money for 3 years at 5% per annum is Rs. 61, find the sum.

Solution

Here CI – SI = 61 and R = 5.

$$\therefore \quad \text{CI} - \text{SI} = P\left[\left(\frac{R}{100}\right)^3 + \left(\frac{R}{100}\right)^2\right]$$

$$\Rightarrow \quad 61 = P\left[\left(\frac{5}{100}\right)^3 + 3\left(\frac{5}{100}\right)^2\right]$$

$$= P\left[\left(\frac{1}{20}\right)^3 + 3\left(\frac{1}{20}\right)^2\right]$$

$$= P\left[\frac{1+3\times 20}{20\times 20\times 20}\right] = P\left[\frac{61}{20\times 20\times 20}\right]$$

$$\Rightarrow \quad P = \text{Rs. } 8000.$$

4.15

If a certain sum becomes n times in t years at compound interest, then the same sum becomes n^m times in mt years.

NUMERICAL CHALLENGE 4.15

A sum of money placed at compound interest doubles itself in 3 years. In how many years will it amount to four times itself ?

Solution

Here n = 2, t = 3 and m = 2

$\therefore$ The given sum of money will becomes four times itself in mt, i.e., $2 \times 3 = 6$ years.

4.16

If a certain sum becomes n times in t years, then the rate of compound interest is given by $R = 100[(n)^{1/t} - 1]$.

NUMERICAL CHALLENGE 4.16

At what rate per cent compound interest does a sum of money becomes four-fold in 2 years?

Solution

The required rate per cent is

$R = 100[(n)^{1/t} - 1] = 100[(4)^{1/2} - 1]$

$= 100(2 - 1) = 100\%$. [Here n = 4 and t = 2]

4.17

If a certain sum of money at compound interest amounts to Rs. x in A years and to Rs. y in B years then the rate of interest per annum is

$$\mathbf{R = \left[\left(\frac{y}{x}\right)^{1/B-A} - 1\right] \times 100\%.}$$

NUMERICAL CHALLENGE 4.17

A sum of money at compound interest amounts to Rs. 4050 in one year and to Rs.4723.92 in 3 years. Find the rate of interest per annum.

Solution

Here x = 4050, y = 4723.92, A = 1 and B = 3.

$$\therefore \quad R = \left[\left(\frac{y}{x}\right)^{1/B-A} - 1\right] \times 100\%$$

$$= \left[\left(\frac{4723.92}{4050}\right)^{1/2} - 1\right] \times 100\%$$

$$= \left(\frac{27}{25} - 1\right) \times 100\% = 8\%.$$

4.18

If a loan of Rs. P at R% compound interest per annum is to be repaid in n equal yearly instalments, then the value of each instalment is given by

$$\mathbf{Rs.} \frac{\mathbf{P}}{\left(\frac{\mathbf{100}}{\mathbf{100+R}}\right) + \left(\frac{\mathbf{100}}{\mathbf{100+R}}\right)^{\mathbf{2}} + \ldots \left(\frac{\mathbf{100}}{\mathbf{100+R}}\right)^{\mathbf{n}}}.$$

NUMERICAL CHALLENGE 4.18

If a sum of Rs. 13040 is to be paid back in two equal annual instalments at $3\frac{3}{4}\%$ per annum, what is the amount of each instalment?

Solution

Each instalment

$$= \frac{P}{\left(\frac{100}{100+R}\right) + \left(\frac{100}{100+R}\right)^2} = \frac{13040}{\left(\frac{100}{100+\frac{15}{4}}\right) + \left(\frac{100}{100+\frac{15}{4}}\right)^2}$$ [Here P = 13040 and R = 15/4]

$$= \frac{13040}{\frac{400}{415} + \left(\frac{400}{415}\right)^2} = \frac{13040}{\frac{400}{415}\left(1 + \frac{400}{415}\right)}$$

$$= 13040 \times \frac{415}{400} \times \frac{815}{400} = \text{Rs. } 6889.$$

1. A certain sum of money amounts to Rs. 15900 at simple rate of interest at 6% p.a. in 1 year. What is the value of principal sum ?

(1) 12000 (2) 18000

(3) 15000 (4) 14000

Sol. as $\frac{15000\times 6\times 1}{100} = 900$

So the total amount = 15900

2. A sum of money becomes 3 times in 12 years. In how many years it will become 5 times at the same rate of simple interest?

(1) 20 years (2) 16 years

(3) 24 years (4) 30 years

Sol. (in first case) SI = 2P for principal P.

(in second case) SI = 4P for pricipal P.

Now since SI is directly proportional to the time at fixed rate of interest.

Therefore to make SI two times it will require 12 years

So to make SI four times it will require 24 years

Thus to make an amount 5 times of the principal requires 24 years at the given rate of interest as per question.

3. A sum of amount at r% compound interest doubles in 3 years. In 9 years it will be k times of the original principal. What is the value of k?

(1) 10 (2) 9 (3) 6 (4) 8

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

1st case $2P = P\left(1+\frac{r}{100}\right)^3$

$\Rightarrow \quad 2 = \left(1+\frac{r}{100}\right)^3$

2nd case $(2)^3 = \left[\left(1+\frac{r}{100}\right)^3\right]^3 = \left(1+\frac{r}{100}\right)^9$

$\Rightarrow \quad k = (2)^3 = 8$ times.

4. Rs. 20000 is being compounded at 20% p.a. If rate of interest is charged half yearly. What will be the amount of 2 years ?

(1) 28292 (2) 27292

(3) 29282 (4) 22358

Sol. $20000\left(1+\frac{20/2}{100}\right)^{2\times 2} = 20000\left(1+\frac{10}{100}\right)^4$

$= 20000\ (1.1)^4$

$= 20000 \times 1.4641$

$=$ Rs. 29282

5. If the rate of interest is 10% p.a. and Rs. 12000 at the compound interest, half yearly. What is the equivalent rate of interest for first year?

Sol. $A = P\left(1+\frac{R}{100}\right)^n = 12000\ (1.05)^2$

$= 12000 \times 1.1025$

$=$ Rs. 13230

Again SI = 13230 – 12000 = 1230

$\therefore \quad 1230 = \frac{12000\times r\times 2}{2\times 100}$

$\Rightarrow \quad R = 10.25\%$

6. The difference between CI and SI for 3 years @ 20% p.a. is Rs. 152. What is the prinicpal lent in each case?

(1) 12000 (2) 1155

(3) 1187.5 (4) None of these

Sol. Difference between CI and SI for 3 years = Rs. 152

$$P\left(\frac{R}{100}\right)^2\left(\frac{R}{100}+3\right) = 152$$

$$P\left(\frac{1}{25}\right)\left(\frac{16}{5}\right) = 152$$

$$P = \frac{152\times 25\times 5}{16}$$

$P = 9.5 \times 25 \times 5 = 1187.5$

7. Rs. 12000 amounts to Rs. 20736 in 3 years at r% Rs. of compound interest. What is the value of r?

(1) 10% (2) 25%

(3) 12% (4) 20%

Sol. $A = P\left(1+\frac{r}{100}\right)^3$

$20736 = 12000\left(1+\frac{r}{100}\right)^3$

$\Rightarrow \quad \frac{20736}{12000} = \left(1+\frac{r}{100}\right)^3$

$\Rightarrow \quad \frac{1728}{1000} = \left(1+\frac{r}{100}\right)^3$

$\Rightarrow \quad \left(\frac{12}{10}\right)^3 = \left(1+\frac{r}{100}\right)^3$

$\Rightarrow \quad \left(1+\frac{2}{10}\right)^3 = \left(1+\frac{r}{100}\right)^3$

$\Rightarrow \quad r = 20\%$

8. A certain sum amounts to Rs. 14641 in 4 years @ 10% p.a. compound annualy. What is the value of pricipal?

(1) Rs. 6000 (2) Rs. 12000

(3) Rs. 10000 (4) data insufficient

Sol. $14641 = P\left(1+\frac{10}{100}\right)^4$

$14641 = P\left(\frac{11}{10}\right)^4$

$P = 14641 \times \left(\frac{10}{11}\right)^4$

$= 10000$

9. A sum of Rs. 10000 is borrowed at 8% p.a. compounded annualy which is paid back in 3 equal annual instalments. What is the amount of each instalments?

(1) Rs. 380

(2) Rs. 2029

(3) Rs. 729

(4) Rs. 3880.335

Sol. $10000 = x\left[\frac{25}{27}+\left(\frac{25}{27}\right)^2+\left(\frac{25}{27}\right)^3\right]$

$= x\times\frac{25}{27}\left[1+\frac{25}{27}+\frac{625}{729}\right]$

$= \frac{25x}{27}\left[\frac{2029}{729}\right]$

$\Rightarrow \quad x = \text{Rs. } 3880.335$

10. A scooty is sold by an automobile agency for Rs. 19200 cash of for Rs. 4800 cash down payment together with five equal montly instalments. If the rate of interest charged by the company is 12% per annum find each instalment.

(1) Rs. 1964 (2) Rs. 14400

(3) Rs. 2649 (4) Rs. 2964.70

Sol. Balance of the price to be paid through instalments

= Rs. 14400

Rate of interest (r) = 12% p.a.

$\therefore \left(14400+\frac{14400\times12\times5}{100\times12}\right) = \left[x+\left(x+\frac{12x}{1200}\right.\right.$

$+\left(x+\frac{12x\times2}{12x\times100}\right)+\ldots+\left(x+\frac{12x\ \ 4}{12x\ \ 100}\right.$ |

$\Rightarrow$ x = Rs. 2964.70, where x is the value of each instalment.

1. At the rate of $8\frac{1}{2}\%$ p.a. simple interest, a sum of Rs. 4800 will earn how much interest in 12 years 3 months ?

(1) Rs. 198 (2) Rs. 4989
(3) Rs. 4998 (4) Rs. 4900

2. What will be the simple interest earned on an amount of Rs. 16,800 in 9 months at the rate of $6\frac{1}{4}\%$ p.a. ?

(1) Rs. 787.50 (2) Rs. 812.50
(3) Rs. 860 (4) Rs. 887.50

3. The simple interest on Rs. 1820 from March 9, 2003 to May 21, 2003 at $7\frac{1}{2}\%$ rate will be :

(1) Rs. 22.50 (2) Rs. 27.30
(3) Rs. 28.80 (4) Rs. 29

4. A person borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends it to another person at $6\frac{1}{4}\%$ p.a. for 2 years. Find his gain in the transaction per year.

(1) Rs. 112.50 (2) Rs. 125
(3) Rs. 150 (4) Rs. 167.50

5. How much time will it take for an amount of Rs. 450 to yield Rs. 81 as interest at 4.5% per annum of simple interest?

(1) 3.5 years (2) 4 years
(3) 4.5 years (4) 5 years

6. A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

(1) 3% (2) 4%
(3) 5% (4) 6%

7. A sum of Rs. 1600 gives a simple interest of Rs. 252 in 2 years and 4 months. The rate of interest per annum is :

(1) 6% (2) $6\frac{1}{4}\%$
(3) $6\frac{1}{2}\%$ (4) $4\frac{1}{2}\%$

8. Reena took a loan of Rs. 1200 with simple interest for as many years as the rate of interest. If she paid Rs. 432 as interest at the end of the loan period, what was the rate of interest?

(1) 3.6 (2) 6
(3) 18 (4) None of these

9. A man took a loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Rs. 5400 interest only for the period. The principal amount borrowed by him was :

(1) Rs. 2000 (2) Rs. 10,000
(3) Rs. 15,000 (4) Rs. 20,000

10. What is the present worth of Rs. 132 due in 2 years at 5% simple interest per annum?

(1) Rs. 112 (2) Rs. 118.80
(3) Rs. 120 (4) Rs. 122

11. A sum fetched a total simple interest of Rs. 4016.25 at the rate of 9 p.c.p.a. in 5 years. What is the sum ?

(1) Rs. 4462.50 (2) Rs. 8032.50
(3) Rs. 8900 (4) Rs. 8925

12. The simple interest at x% for x years will be Rs. x on a sum of :

(1) Rs. x (2) Rs. $\left(\frac{100}{x}\right)$
(3) Rs. 100 x (4) Rs. $\left(\frac{100}{x^2}\right)$

13. In how many years, Rs. 150 will produce the same interest @ 8% as Rs. 800 produce in 3 years @ $4\frac{1}{2}\%$?

(1) 6 (2) 8
(3) 9 (4) 12

14. The simple interest on a certain sum of money at the rate of 5% p.a. for 8 years is Rs. 840. At what rate of interest the same amount of interest can be received on the same sum after 5 years ?

(1) 6% (2) 8%
(3) 9% (4) 10%

15. The interest on a certain deposit at 4.5% p.a. is Rs. 202.50 in one year. How much will the additional interest in one year be on the same deposit at 5% p.a. ?

(1) Rs. 20.25 (2) Rs. 22.50
(3) Rs. 25 (4) Rs. 42.75

16. The simple interest on Rs. 10 for 4 months at the rate of 3 paise per rupee per month is :

(1) Rs. 1.20 (2) Rs. 1.60
(3) Rs. 2.40 (4) Rs. 3.60

17. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is :

(1) Rs. 650 (2) Rs. 690
(3) Rs. 698 (4) Rs. 700

18. The rate at which a sum becomes four times of itself in 15 years at S.I. will be :

(a) 15% (2) $17\frac{1}{2}\%$

(3) 20% (4) 25%

19. If a sum of money at simple interest doubles in 6 years, it will become 4 times in :

(1) 12 years (2) 14 years

(3) 16 years (4) 18 years

20. A sum of money trebles itself in 15 years 6 months. In how many years would it double itself?

(1) 6 years 3 months (2) 7 years 9 months

(3) 8 years 3 months (4) 9 years 6 months.

21. At what rate percent per annum will the simple interest on a sum of money be $\frac{2}{5}$ of the amount in 10 years?

(1) 4% (2) $5\frac{2}{3}\%$

(3) 6% (4) $6\frac{2}{3}\%$

22. In how much time would the simple interest on a certain sum be 0.125 times the principal at 10% per annum?

(1) $1\frac{1}{4}$ year (2) $1\frac{3}{4}$ year

(3) $2\frac{1}{4}$ year (4) $2\frac{3}{4}$ year

23. The sum of money that amounts to Rs. 1100 in 10 years at the rate of 5% simple interest will be approximately:

(1) Rs. 730 (2) Rs.740

(3) Rs.760 (4) Rs.780

24. In how many years a sum will be doubled at 12% per annum at simple interest?

(1) 6 years (2) 7 years

(3) $8\frac{1}{3}$ years (4) $8\frac{1}{2}$ years

25. If an amount doubles itself in 5 years at simple interest, it will become three times in

(1) 10 years (2) 12 years

(3) 8 years (4) None of these

26. The simple interest on a certain sum of money at $3\frac{1}{2}$ % per annum for $2\frac{5}{21}$ years is Rs. 658. The sum is

(1) Rs.7480 (2) Rs.7840

(3) Rs.8120 (4) Rs.8400

27. The amount of Rs. 600 will earn Rs. 300 as simple interest @ 10% per annum in

(1) 4 years (2) 5 years

(3) 6 years (4) 7 years

28. A simple interest rate of $4\frac{3}{4}$ per annum, how much time is needed for Rs. 432 to yield an interest of Rs. 78.66?

(1) 2 years 10 months

(2) 3 years

(3) 3 years and 10 months

(4) 4 years

29. Rs. 1000 is invested at 5% simple interest. If the interest is added to the principal every 10 years, the amount will become Rs. 2000 after

(1) 15 years (2) 18 years

(3) 20 years (4) $16\frac{2}{3}$ years

30. If Rs. 64 amounts to Rs. 83.20 in 2 years, what will Rs. 86 amount to in 4 years at the same rate percent per annum?

(1) Rs. 137.60 (2) Rs. 124.70

(3) Rs. 114.80 (4) Rs. 127.40

31. What will be the compound interest on a sum of Rs. 25,000 after 3 years at the rate of 12 p.c.p.a. ?

(1) Rs. 9000.30 (2) Rs. 9720

(3) Rs. 10123.20 (4) None of these

32. Sam invested Rs. 15,000 @ 10% per annum for one year. If the interest is compounded half-yearly, then the amount received by Sam at the end of the year will be :

(1) Rs. 16,500

(2) Rs. 16,525.50

(3) Rs. 16,537.50

(4)) None of these

33. What is the difference between the compound interests on Rs. 5000 for $1\frac{1}{2}$ years at 4% per annum compounded yearly and half-yearly?

(1) Rs. 6.04 (2) Rs. 3.06

(3) Rs. 4.80 (4) Rs. 8.30

34. Find the compound interest on Rs. 15,625 for 9 months at 16% per annum compounded quarterly.

(1) Rs. 1851 (2) Rs. 1941

(3) Rs 1951 (4) Rs. 1961

35. What will be the difference between simple and compound interest @ 10% per annum on a sum of Rs. 1000 after 4 years?

(1) Rs. 31 (2) Rs. 32.10

(3) Rs. 64.10 (4) None of these

36. The difference between simple interest and compound interest on Rs. 1200 for one year at 10% per annum reckoned half-yearly is :

(1) Rs. 2.50 (2) Rs. 3
(3) Rs. 3.75 (4) None of these

37. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is :

(1) 2 (2) $2\frac{1}{2}$
(3) 3 (4) 4

38. At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?

(1) 6% (2) 6.5%
(3) 7% (4) 7.5%

39. The principal that amounts to Rs. 4913 in 3 years at $6\frac{1}{4}\%$ per annum compound interest compounded annually is :

(1) Rs. 3096 (2) Rs. 4076
(3) Rs. 4085 (4) Rs. 4096

40. In how many years will a sum of Rs. 800 at 10% per annum compounded semiannually become Rs. 926.10 ?

(1) $1\frac{1}{3}$ (2) $1\frac{1}{2}$
(3) $2\frac{1}{3}$ (4) $2\frac{1}{2}$

41. If the compound interest on a sum for 2 years at $12\frac{1}{2}\%$ per annum is Rs. 510, the simple interest on the same sum at the same rate for the same period of time is :

(1) Rs. 400 (2) Rs. 450
(3) Rs. 460 (4) Rs. 480

42. The simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on Rs. 4000 for 2 years at 10% per annum. The sum placed on simple interest is :

(1) Rs. 1550 (2) Rs. 1650
(3) Rs. 1750 (4) Rs. 2000

43. The difference between compound interest and simple interest on an amount of Rs. 15,000 for 2 years is Rs. 96. What is the rate of interest per annum ?

(1) 8 (2) 10
(3) 12 (4) None of these

44. The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is :

(1) 625 (2) 630
(3) 640 (4) 650

45. The compound interest on a sum of money for 2 years is Rs. 832 and the simple interest on the same sum for the same period is Rs. 800. The difference between the compound interest and the simple interest for 3 years will be :

(1) Rs. 48 (2) Rs. 66.56
(3) Rs. 98.56 (4) None of these

46. The difference between the simple interest on a certain sum at the rate of 10% per annum for 2 years and compound interest which is compounded every 6 months is Rs. 124.05. What is the principal sum?

(1) Rs. 6000 (2) Rs. 8000
(3) Rs. 10,000 (4) None of these

47. The difference between compound interest and simple interest on a sum for 2 years at 10% per annum, when the interest is compounded annually is Rs. 16. If the interest were compounded half-yearly, the difference in two interests would be :

(1) Rs. 24.81 (2) Rs. 26.90
(3) Rs. 31.61 (4) Rs. 32.40

48. On a sum of money, the simple interest for 2 years is Rs. 660, while the compound interest is Rs. 696.30, the rate of interest being the same in both the cases. The rate of interest is :

(1) 10% (2) 10.5%
(3) 12% (4) None of these

49. Mr. Dua invested money in two schemes A and B offering compound interest @ 8 p.c.p.a. and 9 p.c.p.a. respectively. If the total amount of interest accrued through two schemes together in two years was Rs. 4818.30 and the total amount invested was Rs. 27,000, what was the amount invested in Scheme A ?

(1) Rs. 12,000 (2) Rs. 13,500
(3) Rs. 15,000 (4) None of these

50. A sum of money invested at compound interest amounts to Rs. 800 in 3 years and to Rs. 840 in 4 years. The rate of interest per annum is :

(1) $2\frac{1}{2}\%$ (2) 4%
(3) 5% (4) $6\frac{2}{3}\%$

51. A sum of money invested at compound interest amounts to Rs. 4624 in 2 years and to Rs. 4913 in 3 years. The sum of money is :

(1) Rs. 4096 (2) Rs. 4260
(3) Rs. 4335 (4) Rs. 4360

52. A sum of money becomes Rs. 13,380 after 3 years and Rs. 20,070 after 6 years on compound interest. The sum is :

(1) Rs. 8800 (2) Rs. 8890
(3) Rs. 8920 (4) Rs. 9040

53. A sum of Rs. 12,000 deposited at compound interest becomes double after 5 years. After 20 years, it will become :

(1) Rs. 96,000 (2) Rs. 1,20,000
(3) Rs. 1,24,000 (4) Rs. 1,92,000

54. A sum of money placed at compound interest doubles itself in 5 years. It will amount to eight times itself at the same rate of interest in:

(1) 7 years (2) 10 years
(3) 15 years (4) 20 years

55. If a sum on compound interest becomes three times in 4 years, then with the same interest rate, the sum will become 27 times in :

(1) 8 years (2) 12 years
(3) 24 years (4) 36 years

56. The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is :

(1) 3 (2) 4
(3) 5 (4) 6

57. A man borrows Rs. 2550 to be paid back with compound interest at the rate of 4% per annum by the end of 2 years in two equal yearly installments. How much will each instalment be ?

(1) Rs. 1275 (2) Rs. 1283
(3) Rs. 1352 (4) Rs. 1377

58. What annual payment will discharge a debt of Rs. 1025 due in 2 years at the rate of 5% compound interest?

(1) Rs. 550 (2) Rs. 551.25
(3) Rs. 560 (4) Rs. 560.75

59. A man borrows Rs. 12,500 at 20% compound interest. At the end of every year he pays Rs. 2000 as part repayment. How much does he still owe after three such installments ?

(1) Rs. 12,000 (2) Rs. 12,864
(3) Rs. 15,600 (4) None of these

60. A sum of money is borrowed and paid back in two annual installments of Rs. 882 each allowing 5% compound interest. The sum borrowed was:

(1) Rs. 1620 (2) Rs. 1640
(3) Rs. 1680 (4) Rs. 1700

61. A sum of money invested at compound interest becomes Rs. 1020 after 3 years and Rs. 1088 after 4 years. The rate of interest is

(1) 5.60% (2) 6.66%
(3) 7.66% (4) 8.66%

62. The difference between S.I. and C.I. on a sum for 2 years at 8% per annum is Rs. 160. If the interest were compounded half yearly, the difference in interests in two years will be nearly

(1) Rs. 246.50 (2) Rs. 240
(3) Rs. 168 (4) Rs. 160

63. In how many years at compound interest, will a sum of money become 27 times when it tribles itself in 2 years at compound interest?

(1) 9 years (2) 6 year
(3) 12 years (4) $13\frac{1}{2}$ years

64. If the compound interest on a certain sum of money for 2 years is Rs. 2700 and the simple interest on the same sum for the same period and for same interest is 1250, then rate %.

(1) 16 percent (2) 10 percent
(3) 18 percent (4) 24 percent

65. The difference between simple interest and compound interest on a sum of money for 2 years ,at 5% is Rs. 25. The sum is

(1) Rs. 8000 (2) Rs. 9000
(3) Rs. 10000 (4) Rs. 15000

66. A sum of money becomes Rs. 6500 after 3 years and Rs. 10562.50 after 6 years on compound interest. The sum is

(1) Rs. 4000 (2) Rs. 4500
(3) Rs. 4800 (4) None of these

67. The difference between compound interest and simple interest on a sum for 3 years at 5% per annum is Rs. 122. The sum is .

(1) Rs. 15000 (2) Rs. I6000
(3) Rs. 12000 (4) Rs. 18000

68. The difference between simple interest and compound interest on a certain sum of money at the end of 2 years is Rs. 117 at 15% per annum, the interest being credited annually. The principal is

(1) Rs.5200 (2) Rs. 5980
(3) Rs. 6760 (4) None these

69. A man saves Rs. 200 at the end of each year and lends the money at 5% compound interest. How much will it become at the end of 3 years?

(1) Rs.565.25 (2) Rs. 635
(3) Rs. 662.02 (4) 666.50

70. The simple interest on a sum of money is $\frac{4}{9}$ times the principal and the rate of interest per annum is numerically equal to the number of years. Find the rate of interest per annum.

(1) $\frac{10}{3}\%$ (2) $\frac{15}{3}\%$

(3) $\frac{20}{3}\%$ (4) $\frac{15}{2}\%$

71. A certain sum becomes 3 times itself in 6 years at simple interest. In how many years will it become 9 times itself ?

(1) 18 (2) 20

(3) 24 (4) 22

72. A certain sum amounts to four times the principal within a period of 2 years. The rate of simple interest per annum is

(1) 150% (2) 15%

(3) 1.5% (4) None of these

73. A certain sum becomes Rs 6400 in 4 years and Rs 8200 in 7 years at simple interest. Find the principal.

(1) Rs. 4000 (2) Rs. 4200

(3) Rs. 4400 (4) Rs. 40000

74. A sum of money amounts to Rs 2000 in 3 years and Rs 2500 in 5 years at simple interest. Find the rate of interest per annum.

(1) $33\frac{1}{3}\%$ (2) $12\frac{1}{3}\%$

(3) 25% (4) 20%

75. What will be the compound interest on Rs 15625 for 3 years at 8% p.a., if the interest is compounded annually ?

(1) Rs 4805 (2) Rs 4508

(3) Rs 4580 (4) Rs 4058

76. The simple interest and the compound interest on a certain sum for 2 years is Rs 1250 and Rs 1475 respectively. Find the rate of interest.

(1) 36% p.a. (2) 34% p.a.

(3) 32% p.a. (4) 38% p.a.

77. A person lent a certain sum of money at 12% p.a. simple interest. In 5 years, the interest received was Rs. 250 less than sum lent. Find the sum lent. (in Rs)

(1) 500 (2) 750

(3) 625 (4) 1000

78. At what rate of simple interest per annum, does the interest on Rs. 1200 in 2 years equal the interest on Rs. 600 at 4 years at $\frac{7}{2}\%$ p.a. ?

(1) $\frac{3}{4}\%$ (2) $\frac{7}{2}\%$

(3) $\frac{4}{3}\%$ (4) $\frac{7}{8}\%$

79. The population of a village increases at a rate of 5% every year. If the present population of the village is 5620, find the population after 1 year.

(1) 5805 (2) 6121

(3) 5901 (4) 6000

80. Kalyan purchased an old bike of Rs. 12000. If its cost after 2 years is Rs. 11524.80, the rate of depreciation is _____.

(1) 1% p.a. (2) 4% p.a.

(3) 3% p.a. (4) 2% p.a.

81. Ram borrowed Rs. 8000 at $3\frac{1}{2}\%$ p.a. compound interest for his family needs. How much amount does he have to pay to clear the debt at the end of one year and three months ?

(1) Rs. 8352.45 (2) Rs. 8532.45

(3) Rs. 8253.54 (4) Rs. 8352.54

82. Ravi borrowed Rs.1000 from Sridhar at 3% C.I. for the year, 5% C.I. for the second year. What amount does Sridhar get at the end of the second year ?

(1) Rs.1081 (2) Rs. 1081.50

(3) Rs. 1082.50 (4) Rs. 1083

83. Saleem borrowed Rs. 20000 at compound interest and paid Rs. 22050 after 2 year to clear the debt. Find the rate of interest.

(1) 3% (2) 5%

(3) 4% (4) 7%

84. If Rs. 300 is the interest paid on a certain sum at the rate of 5% p.a. simple interest for a period of 5 years, then find the sum. (in Rs.)

(1) 1200 (2) 1600

(3) 2000 (4) 1800

85. At what rate percent per annum at compound interest will the sum of Rs. 375 amount to Rs. 1029 in 3 years?

(1) 20 (2) 30

(3) 25 (4) 40

86. A person borrowed a certain sum of money at $16\frac{2}{3}\%$ p.a. compound interest. He cleared the debt by paying Rs. 20825 at the end of 2 years. Find the sum borrowed.

(1) Rs. 15300 (2) Rs. 15800

(3) Rs. 14300 (4) Rs. 14800

87. In how many years will a sum of Rs. 3200 compounded quarterly at the rate of 50% p.a. amount to Rs. 4050 ?

(1) one year (2) half year

(3) two years (4) 3 years

88. Ramakrishana borrowed Rs. 160000 from Anurudh at 10% p.a. simple interest. After 2 years, when Ramakrishana wants to clear the debt, Anirudh insisted Ramakrishna to pay him at compound interest. How much more must Ramakrishna pay ?

(1) Rs. 800 (2) Rs. 1620
(3) Rs. 1600 (4) Rs. 810

89. A sum of Rs. 5120 amounts to Rs. 7290 in 3 years at compound interest. Find the rate of interest per annum ?

(1) $33\frac{1}{3}\%$ (2) $12\frac{1}{2}\%$

(3) $8\frac{1}{3}\%$ (4) $17\frac{1}{2}\%$

90. The difference between the compound interest and the simple interest on a certain sum of money for 2 years at 11% per annum is Rs. 363. Find the sum.

(1) Rs. 33000 (2) Rs. 31000
(3) Rs. 30000 (4) Rs. 32000

91. A sum of Rs. 3000 is partly lent at 3% p.a. simple interest for $\frac{7}{2}$ years and partly at 2% p.a. simple interest for 4 years. If total interest earned is Rs. 280, then the sum lent at 3% p.a. is :-

(1) Rs. 1600 (2) Rs. 1400
(3) Rs. 1800 (4) Rs. 2000

92. Find the simple interest (approximately) on Rs. 700 from 20 December 2006 to 20 June 2007 at 6% p.a. (in Rs)

(1) 24 (2) 27
(3) 28 (4) 21

93. A sum of money triples itself in 3 years at compound interest. In how many years will it become 9 times itself ?

(1) 4 (2) 9
(3) 6 (4) 7

94. Raju invested a sum of Rs. 5832 at a rate of interest n% per annum, compounded annually. Find the value of n, if he received a sum of Rs. 13824 after 3 years.

(1) $33\frac{1}{3}$ (2) $33\frac{2}{3}$

(3) $33\frac{4}{3}$ (4) $33\frac{5}{3}$

95. A sum of Rs. 2500 is invested for 2 years at 20% per annum, interest compounded half-yearly. Find the compound interest.

(1) Rs. 3660.25
(2) Rs. 1660.25
(3) Rs. 1160.25
(4) Rs. 1330

96. Alok borrowed a certain sum on 9 july 2006 and paid an amount of Rs. 438 which included an interest of Rs. 6 on 8 November 2006. Find the rate of interest, charged to Alok, per annum.

(1) $6\frac{1}{4}\%$ (2) $4\frac{1}{6}\%$
(3) $1\frac{4}{6}\%$ (4) $13\frac{1}{3}\%$

97. The simple interest on Rs. 3000 at R% in 2 years equals to the simple interest on Rs. 2000 at 10% p.a. in 3 years. Find the simple interest (in Rs) on Rs. 5000 at R% p.a. for 4 years.

(1) 1500 (2) 2000
(3) 5000 (4) 2400

98. Sushma deposited Rs. 6500 which amounted to Rs. 7800 in 4 years at simple interest. Had the interest been 2% more per annum, how much would she have received ? (in Rs.)

(1) 8000 (2) 8500
(3) 7600 (4) 8320

99. The cost of a scooter is Rs. 10000. Its value depreciates at the rate of 8% p.a. Calculate the total depreciation in its value at the end of 2 years.

(1) Rs. 1536 (2) Rs. 1356
(3) Rs. 1653 (4) Rs. 1356

100. A person borrowed Rs. 8000 at $2\frac{1}{2}\%$ p.a. under S.I. The sum borrowed is immediately given to another person at the same rate on the condition that the interest is compounded semi-annually. Find the amount gained by the first person in one year.

(1) Rs. 3.25 (2) Rs. 2.25
(3) Rs. 1.25 (4) Rs. 0.25

101. A boy's height is increasing at the rate of 2% over that of the previous year. If his present height is 156.06 cm, what was his height two year ago ?

(1) 148 cm (2) 150 cm
(3) 152 cm (4) 151 cm

102. Ramu invested a sum of Rs. 12500 at 12% per annum compound interest. He received an amount of Rs. 15680 after x years. Then, the value of x is

(1) 1 (2) 4
(3) 3 (4) 2

103. The rate of interest for a sum that becomes $\frac{729}{576}$ times itself in 2 years, when compound annually is

(1) $\frac{32}{5}\%$ (2) $\frac{12}{5}\%$

(3) $\frac{25}{2}\%$ (4) $\frac{12}{7}\%$

104. A person deposited Rs. 6000 in a bank for 2 years. At the end of the year, he withdrew Rs. 500. How much does he get from the bank at the end of the second year interest paid at rate of $8\frac{1}{3}\%$ p.a. compounded annually ?

(1) Rs. 6500 (2) Rs. 7000
(3) Rs. 6725 (4) Rs. 6025

105. A sum amounts to Rs. 3600 at 2% p.a. under simple interest and Rs. 4800 at 4% p.a. under simple interest. The time taken is _____.

(1) 2.5 years (2) 3 years
(3) 30 years (4) 25 years

106. Find the compound interest on Rs. 50000 for 3 years, compounded annually and the rate of interest being 10%, 12% and 15% for the three successive years respectively.

(1) Rs. 20840 (2) Rs. 70840
(3) Rs. 60720 (4) Rs. 67560

107. Q and R borrowed Rs. 26000 and Rs. 25000 respectively, for a period of 2 years. Q paid simple interest at the rate of 2% p.a., while R paid compound interest at the same rate, compounded annually. Who paid more interest and by how much ?

(1) R paid more than Q by Rs. 40
(2) R paid more than Q by Rs. 30
(3) Q paid more than R by Rs. 40
(4) Q paid more than R by Rs. 30

108. A person invested one-fifth of the capital at 5% p.a., one-sixth of the capital at 6% p.a. and the rest at 10% p.a. simple interest. If the annual interest received on his investment is Rs. 150, then find the capital. (in Rs.)

(1) 1000 (2) 1500
(3) 2000 (4) 1800

109. Kailash set up a factory by investing Rs.1000000. During the first two years, his profits were 10% and 15% respectively. If he reinvested the profit of each year at the beginning of the next year, his total profit (in Rs) is :-

(1) 265000
(2) 25000
(3) 275000
(4) 27060

110. In what time will the sum of Rs. 1875 yield a compound interest of Rs. 477, at 12% per annum compounded annually ?

(1) 2 years (2) 1 year
(3) 3 years (4) $1\frac{1}{2}$ years

111. Find the simple interest on Rs. 1098 at 5% per annum from 5 May 1996 to 25 May 1996.

(1) Rs. 5 (2) Rs. 7
(3) Rs. 3 (4) Rs. 4

112. Varun started a business with an initial investment of Rs. 300000. In the first year, he incurred a loss of 3%. So he invested remaining amount in the bank at 4% p.a. for the second year and at 5% p.a. for thr third year under compound interest compounded annually. Find the amount.

(1) Rs. 317772
(2) Rs. 315522
(3) Rs. 316622
(4) Rs. 314422

113. Suresh and Naresh borrowed Rs. 62500 and Rs. 60000 respectively for a period of 2 years. Suresh paid simple interest at the rate of 4% per annum, while Naresh paid compound interest at the same rate compounded annually. Who paid more interest and by how much ?

(1) Naresh paid more by Rs. 104
(2) Suresh paid more by Rs. 104
(3) Naresh paid more by Rs. 94
(4) Both paid the same interest

114. The simple interest and compound interest on a certain sum for 2 years are Rs. 2400 and Rs. 2640 respectively. The rates of interests (in % p.a.) for both are the same. The interest on the sum lent at compound interest is compounded annually. Find the rate of interest (in % p.a.).

(1) 30 (2) 20

(3) 25 (4) 10

115. A sum was split into three parts. The first part was lent at 10% p.a. for 4 years. The second part was lent at 20% p.a. for 6 years. The third part was lent at 30% p.a. for 5 years. Each part was lent at simple interest and the same amount of simple interest was realized from each. Find the ratio of the first, second and third parts.

(1) 15 : 5 : 2 (2) 20 : 7 : 2

(3) 15 : 5 : 4 (4) 20 : 9 : 4

116. A doctor wants to divide Rs. 145000 between his son and daughter who are 12 years and 14 years respectively, in such a way that the sum invested at the rate of $12\frac{1}{2}\%$ per annum compounded annually will give the same amount to each, when they attain 16 years. How should he divide the sum ?

(1) Rs. 81000 to son and Rs. 64000 to daughter

(2) Rs. 64000 to son and Rs. 81000 to daughter

(3) Rs. 45000 to son and Rs. 100000 to daughter

(4) Rs. 100000 to son and Rs. 45000 to daughter

117. Given that carbon-14 (C_{14}) decays at a constant rate in such a way that it reduces to 20% in 1562 years. The age of a wooden piece in which the carbon is only 4% of the original is ____.

(1) 3122 years (2) 3210 years

(3) 3124 years (4) 3214 years

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	3	1	2	1	2	4	4	2	3	3	4	2	3	2	2	1	3	3	4	2
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	1	1	1	3	1	4	2	3	4	1	3	3	1	3	3	2	1	1	4	2
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	4	3	1	1	3	2	1	4	1	3	1	3	4	3	2	2	3	2	4	2
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	2	1	2	1	3	1	2	1	3	3	3	1	1	4	4	1	3	2	3	4
Que.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	1	2	2	1	4	1	2	3	2	3	1	4	3	1	3	2	2	4	1	3
Que.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117			
Ans.	2	4	3	1	4	1	4	4	1	1	3	1	2	2	3	2	3			