Interest (I) : Money paid by borrower for using the lender's money.

Principal (P) : The amount of money borrowed.

Time (T) : Time for which money is borrowed.

Rate of Interest (R): Interest to be paid for a year on Rs. 100.

Amount : Sum of Principal + Interest.

Simple Interest (SI) :- Interest is calculated every time period on the initial principal.

P		SI
Rs. 100	$\xrightarrow[R\%]{1 \text{ year}}$	R
Rs. 1	$\xrightarrow[R\%]{1 \text{ year}}$	$\frac{R}{100}$
Rs. P	$\xrightarrow[R\%]{1 \text{ year}}$	$P \times \frac{R}{100}$
Rs. P	$\xrightarrow[R\%]{T \text{ years}}$	$P\frac{R}{100} \times T$

$$\therefore SI = \frac{PRT}{100} \qquad \frac{SI}{P} = \frac{RT}{100}$$

let $P = 100\%$, $SI = RT\%$

$$\text{Amount} = (100 + RT)\%$$

\# $R = 8\%$ P.a, $T = 5$ years

$RT\% = 5 \times 8\%$

$= 40\% = \frac{2 \leftarrow SI}{5 \leftarrow P}$

SI : 2 units

P : 5 units

A : 7 units

① The simple Interest on a certain sum at 15% p.a. for 3 years is Rs. 7,200/- the sum is :

Soln:-

$RT\% = 15 \times 3\% = 45\%$

$45\% = \frac{9}{20} \begin{matrix} \leftarrow SI \\ \leftarrow P \end{matrix}$

9 units	$\times 800$	Rs. 7,200
20 units	$\times 800$	Rs. 16,000

---

② Find the value of Interest earned on a sum of Rs. 6,000 for 5 years at 8.4% simple Interest rate per annum.

Soln:- $RT\% = 8.4 \times 5\% = 42\%$

AT Q, 100%	$\times 60$	Rs. 6,000
42%	$\times 60$	Rs. 2,520

---

③ How much amount can a person get on a sum of Rs. 6,600 if it is invested at 6.2% per annum for a period of 2 year and 6 months.

Soln:- $6.2 \times 2\frac{1}{2}\% = 6.2 \times \frac{5}{2}\% = \frac{31}{200} \begin{matrix} \leftarrow SI \\ \leftarrow P \end{matrix}$

Amount = 231 units

AT Q, 200 units	$\times 33$	Rs. 6,600
231 units	———	Rs. 7,623

---

④ Ramya lent a certain sum of money at 4% simple Interest to Seema and in 8 years, the Interest amounted to Rs. 3,400 less than sum lent. find the sum lent by Ramya to Seema.

Soln:- RT% = 4 × 8% = 32% = $\frac{8}{25}$ ← SI (17 units), ← P

ATQ, 17 units —— ×200 —— Rs. 3,400

25 units —— ×200 —— Rs. 5,000

---

(5) Nitin borrowed some money at the rate of 6% p.a. for the first 3 years, 9% p.a. for the next five years and 13% p.a. for the period beyond eight years. If the total interest paid by him at the end of eleven years is Rs. 8,160, the money borrowed by him was:

Soln:- 6 × 3 = 18%

9 × 5 = 45%

13 × 3 = 39%

SI = 102%

ATQ, 102% —— ×80 —— Rs. 8,160

100% —— ×80 —— Rs. 8,000

---

(6) The sum lent at 5% per annum (i.e. 365 days) simple interest, that produces interest of Rs. 2.00 per day is:

Soln:-

1 day —— 2.00 ×365

1 year —— 730

ATQ

5% —— 730 ×20

100% —— 14,600

---

(7) Tushar borrowed a sum of Rs. 12,000 at 15% per annum from a money lender on 13th January, 1987 and return the amount on 8th June, 1987 to clear his debt. The amount paid by Tushar to the money lender to clear his debt was:

Soln:-

Jan – 18

Feb – 28

Mar – 31

Apr – 30

May – 31

Jun – 8

Time = 146 days

146 days = $\frac{146}{365} = \frac{2}{5}$ years

RT% = $\frac{2}{5}$ × 15% = 6%

100% —— 12,000

(8) In what time Rs. 1500 will become Rs. 1815 at the rate of Simple Interest of 7% per annum?

Soln:- SI = 1815 − 1,500 = 315

$$7\% \Rightarrow \begin{matrix} 100 & \xrightarrow{1\text{ year}} & 7 \\ 1500 & \xrightarrow{1\text{ year}} & 105 \end{matrix} \times 15 \quad (\times 15)$$

$$T = \frac{SI}{SI \text{ for } 1 \text{ year}} = \frac{315}{105} = 3 \text{ years}$$

---

(9) A sum of Rs. 2400 gives a simple interest of Rs. 504 in 3 years. Find the rate of interest per annum:

Soln:- 3 years ——— 504

1 year ——— 168

$$R\% = \frac{SI \text{ for } 1 \text{ year}}{\text{Principal}} \times 100$$

$$\therefore R\% = \frac{168}{2400} \times 100 = 7\%$$

---

(10) In what time will the simple interest be $\frac{2}{5}$ of the Principal at 8% per annum?

Soln:- $SI = RT\% = \frac{2}{5} = 40\%$

$\Rightarrow 8T = 40 \quad (\because R = 8)$

$\Rightarrow T = 5$ years

---

(11) If the total simple interest on a sum for 25 years is $\frac{5}{8}$ of the principal, what is the rate of simple interest paid per annum.

Soln:- $SI = RT\% = 25R\% = \frac{5}{8}$

$\Rightarrow 25\% R = \frac{5}{8}$

$\Rightarrow \frac{R}{4} = \frac{5}{8}$

$\Rightarrow R = \frac{5}{2}$

(12) The simple interest on a sum of money is $\frac{8}{25}$ of the sum. If the number of years is numerically half the rate percent per annum, then rate percent per annum is:

Soln:- $SI = RT\% = \frac{8}{25} = 32\%$

$\Rightarrow \frac{R^2}{R} = 32 \quad (\because T = \frac{R}{2})$

$\Rightarrow R^2 = 64 \Rightarrow R = 8$

---

(13) If a certain sum of money thrice of itself in 5 years 4 months simple interest, then what will be the yearly rate of interest?

Soln:- $T = 5 \text{ years } 4 \text{ months} = 5\frac{1}{3} = \frac{16}{3} \text{ years}$

Amount	Principal	SI
300%	100%	200%

$\therefore RT\% = 200\%$

$\Rightarrow \frac{16}{3}R = 200$

$R = 200 \times \frac{3}{16} = 37.5$

---

(14) If the simple interest for 6 years be equal to 30% of the principal, it will be equal to the principal after:

Soln:- $RT\% = 30\%$

$\Rightarrow 6R = 30$

$\Rightarrow R = 5$

Again $SI = \text{Principal}$

$\Rightarrow SI = 100$

$\Rightarrow T = 20 \text{ years}$

---

(15) A certain sum becomes 5 times in 3 years at simple interest, then in how many years it will become 13 time

Soln:-

Amount	Principal	SI	Time
5	1	4	3 years
		$\times 3$	$\times 3$
13	1	12	9 years

(16) A certain Sum 8 times in 12 years at certain rate of Simple Interest. How many times it would be in 20 years.

Soln:-

Amount	Principal	SI	year
8	1	7	12 years
$1+\frac{35}{3}$	1	$\frac{35}{3}$	20 years

$\times \frac{5}{3}$ $\times \frac{5}{3}$

$1+\frac{35}{3} = 1+11\frac{2}{3} = 12\frac{2}{3}$ times.

---

(17) At 6% P.a. rate of simple interest, a certain Sum becomes 4 times in a certain time period. At what rate of Interest Same Sum will become 10 times in same time Period?

Soln:-

Amount	Principal	SI	ROI
4	1	3	6%
10	1	9	18%

$\times 3$ $\times 3$

---

(18) A Sum of Rs. 800 amounts to Rs. 920 in 3 years at the Simple interest rate. If the rate is increased by 3% P.a. what will be the Sum amount to the Same period?

Soln:- $3 \times 3 = 9\%$ of the principal will be received as the extra interest.

$\therefore$ Amount $= 920 + \frac{9}{100} \times 800 = 920 + 72 = 992$

---

(19) Rs. 1000 is Invested at 5% Per annum Simple Interest. If the Interest is added to the Principal after every 10 years the amount will become Rs. 2000 after how many years.

Soln:- $1000 \xrightarrow[5\%]{10 \text{ years}} 500$

After 10 years $P = 1,500$

$SI = 2,000 - 1,500 = 500$

Again $5\% \rightarrow 1500 \xrightarrow[5\%]{1 \text{ year}} 75$

$T = \frac{500}{75} = \frac{20}{3} = 6\frac{2}{3}$

Required time $= 10 + 6\frac{2}{3} = 16\frac{2}{3}$ years

(20) At a certain rate of simple interest of Rs. 7,200 become Rs. 9360 in 4 years. If the rate of interest reduces by 20% then what will be the new amount in same time period?

Soln:- ROI x SI

As ROI reduces by 20%

Interest will reduce by 20%.

SI = 9360 - 7200 = 2160

SI decreases by

2160 x 20% = 432

New amount = 9360 - 432

= 8,928

---

(21) A sum lent out at simple interest amounts to Rs. 6076 in one year and Rs. 7504 in 4 years. The sum and the rate of interest P.a. are respectively:

Soln:-

1 year → 6076

4 years → 7504

1428

3 years ——— 1428

1 year ——— 476

∴ Principal = 6076 - 476 = 5600

$ROI = \frac{476}{5600} \times 100 = 8.5\%$

---

(22) A certain sum becomes Rs. 1020 in 5 years and Rs. 1200 in 8 years at simple interest. what is the value of Principal?

Soln:-

3 years: 5 years ——— 1020; 8 years ——— 1200

180

3 years ——— 180

1 years ——— 60

5 years ——— 300

∴ Principal

= 1020 - 300

= 720

(23) A certain sum of money amount to Rs. 2,200 at 5% interest, Rs. 2320 at 8% interest in the same period of time. The period of time is :

Soln:- rate of interest increases by 3%, SI will increase by 3%,

Increase in SI = 2320 - 2200 = 120

$\Rightarrow$ 3% ——— 120

1% ——— 40

5% ——— 200

$\therefore$ Principal = 2200 - 200 = 2000

$RT\% = \frac{200}{20} \times 100 = 10\%$

$\Rightarrow 5\%.T = 10\% \Rightarrow T = 2$ years

——————— X ———————

(24) The If a sum of money Rs. 4000 in 2 years and Rs 5500 in 4 years 6 months at the same rate of simple interest per annum. Then the rate of simple interest is :

Soln:-

2 years ——— 4000)
2.5 years (1500
4.5 years ——— 5500)

$\frac{5}{2}$ years ——— 1500

1 year ——— 600

2 years ——— 1200

Principal = 4000 - 1200 = 2800

$R\% = \frac{\text{SI for 1 year}}{\text{Principal}} \times 100 = \frac{600}{2800} \times 100$

$= 21\frac{3}{7}\%$

(25) A sum of Rs. 400 becomes Rs. 448 at simple interest in 2 years. In how many years will the sum of Rs. 550 amount to Rs. 682 at the same rate?

Soln:-

P	A

$100 \xrightarrow{2\text{ years}} 112 \xrightarrow{2\text{ years}} 124$

T = 4 years

---

(26) A Sum of Rs. 10,500 amounts to Rs. 13,825 in $3\frac{4}{5}$ years at a certain rate percent per annum simple interest what will be the simple interest on the same sum for 5 years at double the earlier rate?

Soln:-

$R_1T_1 : R_2T_2$

$3\frac{4}{5}R : 5 \times 2R$

$\frac{19}{5} : 10$

$19 : 50$

SI = 13825 − 10500 = 3325

19 units ——— 3325

1 unit ——— 175

50 unit ——— 8750

---

(27) A sum of Rs. 8400 amounts to Rs. 11,046 at 8.75% P.a. Simple interest in certain time. what is the simple interest on the sum of Rs. 9600 at the same rate for the same time?

Soln:- SI = 11046 − 8400 = 2646

P : SI = 8400 : 2646

(1200 : 378) × 7

(200 : 63) × 6

200 units $\xrightarrow{\times 48}$ 9600

63 units $\xrightarrow{\times 48}$ 3024

Note: If RT% remains same in both cases then P:SI will be same in both cases

(28) The amount received on a sum invested at 8% per annum simple interest for 3.5 years exceeds the simple interest on the same sum at the rate of for 15 years by Rs. 600 what will be the amount (in Rs.) of the same sum in 5.5 years at double the same rate at simple interest.

Soln:- Amount = 100 + 8 × 3.5% = 128%

SI = 15 × 8% = 120%

Diff = 128% − 120% = 8%

New amount = 100% + 5.5 × 16 = 18.8%

ATQ 8% ——— 600

×47 (4% ——— 300) ×47

188% ——— 14,100

———— × ————

(29) Rs. 4300 becomes Rs. 4644 in 2 years at simple interest Find the principal amount that will become Rs. 10104 Rupees in 5 years at the same rate of interest.

SI = 4644 − 4300 = 344

2 years ——— 344

1 year ——— 172

$R\% = \frac{172}{4300} \times 100$

= 4%.

Again RT% = 4 × 5% = 20%

$20\% = \frac{1 \leftarrow SI}{5 \leftarrow P}$

ATQ, 6 units ——— 10104

1 unit ——— 1684

5 units ——— 8420

———— × ————

(30) A sum of Rs. 7930 is divided into 3 parts and given at loan at 5% simple interest to A, B and C for 2, 3 and 4 years respectively. If the amounts of all three are equal after their respective periods of loan, then the A received a loan of :

Soln:- (100% + 2 × 5%)A = (100% + 3 × 5%) B = (100% + 4 × 5%)C

=> 110A = 115B = 120C => 22A = 23B = 24C

$A : B : C = 23 \times 24 : 22 \times 24 : 22 \times 23$

$= 23 \times 12 : 11 \times 24 : 11 \times 23$

$= 276 : 264 : 253$

Received loan by $A = \frac{276}{276+264+253} \times 7930$

$= \frac{276}{793} \times 7930 = 2760$

---

(31) Two equal sums lent at 10% and 8% simple interest p.a. respectively, at the same time. The first sum is received 2 years earlier then the second one and the amount received in each case was Rs. 36,900 each Sum was:

Soln:- $10T\% = 8(T+2\%) = SI$

$\Rightarrow 10T = 8T + 16$

$\Rightarrow T = 8$ years

Again $(100 + 10 \times 8)\% = 180\% = \text{Amount}$

AT@ $180\% \text{ ——— } 36,900$

$1\% \text{ ——— } 205$

$100\% \text{ ——— } 20,500$

---

(32) A sum of Rs. 5000 is divided into two parts such that the simple interest on the first part for $4\frac{1}{5}$ years at $6\frac{2}{3}\%$ p.a. is double the simple interest on the second part of $2\frac{3}{4}$ years at 4% p.a. what is the difference between the two parts?

Soln:- $x \times \frac{21}{5} \times \frac{20}{3}\% = 2 \times y \times \frac{11}{4} \times 4\%$

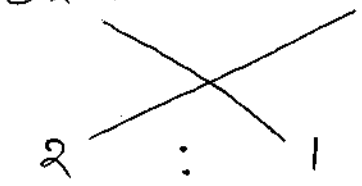
$\Rightarrow x \times 28 = 2y \times 11 \Rightarrow \frac{x}{y} = \frac{11}{14} \rightarrow 25$ units

25 units $\xrightarrow{\times 200}$ 5000

Diff 3 units $\xrightarrow{\times 200}$ 600

(33) Rs. 26100 is divided between Ram and Shyam so that the interest that ram received in 3 years is the same as that shyam receives in 6 years. If the Interest of 4% p.a. then Ram's share is :

Soln:-



3 units ——— 26100
1 units ——— 8700
2 units ——— 17400

———————— x ————————

(34) A person invested a total sum of Rs. 7900 in three different schemes of simple interest at 3%, 5% and 8% per annum, A the end of one year he got same interest in all three schemes. what is the money (in Rs) invested at 3%?

Soln:- $A \times 3\% \times R = B \times 5\% \times R = C \times 8\% \times R$

$3A = 5B = 8C$

$\Rightarrow A : B : C = 5 \times 8 : 8 \times 3 : 3 \times 5 = 40 : 24 : 15 = 79$ units

———————— x ————————

(35) on a simple interest Rs. 708 becomes Rs. 944 in four years If the rate of interest is increased by 5% then Rs. 675 will become how much in 4 years.

Soln:- $SI = 944 - 708 = 236$

P		SI
708		236
3	:	1
675	:	225

(×225 on both rows)

New Amount = 675 + 225 + 20% of 675

= 675 + 225 + 135

(36) If a sum of money amounts to Rs. 12,900 and Rs. 14,250 at the end of 4th year and 5th year respectively at a certain rate of simple interest, then the rate of Interest is :

Soln:-

$$P \xleftarrow[\text{SI for 4 years}]{4 \times 1350} 12,900 \xrightarrow[\text{SI for 1 years}]{1350} 14,250$$

$P = 12,900 - 4 \times 1350 = 12900 - 5400 = 7500$

$ROI = \frac{1350}{7500} \times 100 = 18\%$

---

(37) Mohan borrowed a sum of Rs. 4,22,092 at the rate of 20% per annum simple interest. At the end of the first year, he repays Rs. 21,679 towards return of principal amount borrowed. If mohan clear all pending dues at the end of the second year, including interest payment that accured during the 1st year, how much does he pay (in Rs) at the end of the 2nd year

Soln:-

4,22,092 $\xrightarrow{20\%}$ 84,418.4 (Interest for 1st year)

$-$ 21,679

4,00,413 $\xrightarrow{20\%}$ 80,082.6 (Interest for 2nd year)

↓

Principal for 2nd year

Amount paid at the end of 2nd year

$= 400413 + 84418.4 + 80082.6 = 564914$

---

(38) Rama lent Rs. 3000 to Raja and a certain sum to Ravi at the same time and at the same rate of simple Interest of 8% P.a. After 5 years, he received a sum of Rs. 1600 from Raja and Ravi together as interest. Find the sum lent to Ravi

Soln:- $8 \times 5\% = 40\%$ — ×40 — 1600

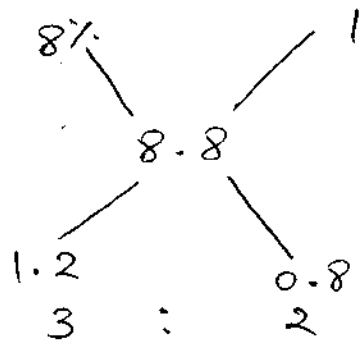
100% — 4000

Raja ← 3000 + 1000 → Ravi

---

(39) Kiran lent Rs. 4000 to two persons such that one part of it at the rate of 8% per annum and the remaining part at the rate of 10% per annum. He got an simple interest of Rs. 352. Then the sum lent at 10% is :

Soln:- overall rate of Interest $= \frac{352}{4000} \times 100 = 8.8$



5 units — ×800 — 4000

2 units — ×800 — 1600

or

8% + 2% → Extra

$4000 \times 8\% = 320$

Extra SI $= 352 - 320 = 32$

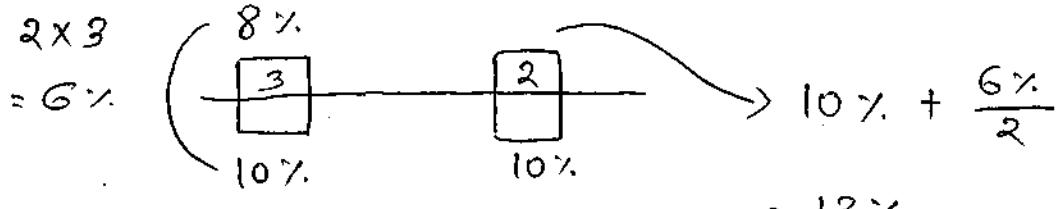
2% — ×16 — 32

100% — ×16 — 1600

---

(40) Arun lends Rs. 20,000 to two of his friends. He gives Rs. 12,000 to the first at 8% p.a. simple interest. Arun wants to make a profit of 10% on the whole. the simple interest rate at which he should lend the remaining sum of money to the second friend is :

Soln:- 12,000 : 8000 = 3 : 2



(41) A sum of Rs. 10,000 is invested in three schemes of Simple interest. The annual interest rates are respectively 4%, 6% and 10%. Rs 4000 where invested in the first scheme. If the total interest earned after five years is Rs. 2800 then how much money was invested in the 3rd Scheme.

Soln:- 1st Scheme SI = $4000 \times 4\% = 160$

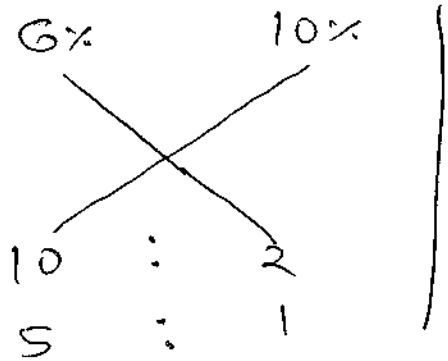
5 years ——— 2800

1 years ——— 560

2nd and 3rd Scheme SI = 560 − 160 = 400

Principal of 2nd and 3rd Scheme = 10,000 − 4,000
= 6,000

Overall ROI = $\frac{400}{6000} \times 100 = \frac{20}{3}$



6 units ——— 6,000

1 unit ——— 1,000

X

(42) Pankaj invests an amount divided into three different Schemes A, B and C at 10%, 12% and 15% per annum respectively and the accumulated total interest in one year is Rs. 3200. The amount invested in Plans A, B and C is in the ratio of 8 : 5 : 12. What amount does he invest in plan B?

Soln:-

P → 2 : 1 : 3

R → 2 : 3 : 3

SI → 4 : 3 : 9

ATQ 16 units —×200— 3200

3 units ——— 600

Scheme B

Again 12% ——— 600

4% ——— 200

P → 100% ——— 5000